NSSME | THE NATIONAL SURVEY OF SCIENCE & MATHEMATICS EDUCATION

2018 NSSME+ Compendium of Tables

January 2019

Laura M. Craven
Anna D. Bruce
Courtney L. Plumley

horizon RESEARCH, INC.

Disclaimer

The *2018 NSSME+ Compendium of Tables* was prepared with support from the National Science Foundation under grant number DGE-1642413. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

Suggested Citation

Craven, L. M., Bruce, A. D., & Plumley, C. L. (2019). *2018 NSSME+ compendium of tables.* Chapel Hill, NC: Horizon Research, Inc.

Additional Information

More details and products from the 2018 NSSME+, as well as previous iterations of the study, can be found at: http://horizon-research.com/NSSME/

TABLE OF CONTENTS

Page

LIST OF TABLES

Introduction

In 2018, the National Science Foundation supported the sixth in a series of surveys through a grant to Horizon Research, Inc. (HRI). The first survey was conducted in 1977 as part of a major assessment of science and mathematics education and consisted of a comprehensive review of the literature; case studies of 11 districts throughout the United States; and a national survey of teachers, principals, and district and state personnel. A second survey of teachers and principals was conducted in 1985–86 to identify trends since 1977. A third survey was conducted in 1993, a fourth in 2000, and a fifth in 2012. This series of studies has been known as the National Survey of Science and Mathematics Education (NSSME).

The 2018 iteration of the study included an emphasis on computer science, particularly at the high school level, which is increasingly prominent in discussions about K–12 STEM education and college and career readiness. The 2018 NSSME+ (the plus symbol reflecting the additional focus) was designed to provide up-to-date information and to identify trends in the areas of teacher background and experience, curriculum and instruction, and the availability and use of instructional resources. The research questions addressed by the study are:

1. To what extent do computer science, mathematics, and science instruction reflect what is known about effective teaching?
2. What are the characteristics of the computer science/mathematics/science teaching force in terms of race, gender, age, content background, beliefs about teaching and learning, and perceptions of preparedness?
3. What are the most commonly used textbooks/programs, and how are they used?
4. What influences teachers' decisions about content and pedagogy?
5. What formal and informal opportunities do computer science/mathematics/science teachers have for ongoing development of their knowledge and skills?
6. How are resources for computer science/mathematics/science education, including well-prepared teachers and course offerings, distributed among schools in different types of communities and different socioeconomic levels?

Data for the study come from six instruments:

School-level questionnaires

1. School Coordinator Questionnaire;
2. Mathematics Program Questionnaire;
3. Science Program Questionnaire;

Teacher-level questionnaires

4. High School Computer Science Teacher Questionnaire;[1]
5. Mathematics Teacher Questionnaire; and
6. Science Teacher Questionnaire.

The design and implementation of the 2018 NSSME+ involved developing a sampling strategy and selecting samples of schools and teachers, developing and piloting survey instruments, collecting data from sample members, and preparing data files and analyzing the data. These activities are described below, followed by an overview of the contents of the remainder of the report.

Sample Design and Sampling Error Considerations

The 2018 NSSME+ is based on a national probability sample of schools and science, mathematics, and computer science teachers in grades K–12 in the 50 states and the District of Columbia. The sample was designed to yield national estimates of course offerings and enrollment, teacher background preparation, textbook usage, instructional techniques, and availability and use of facilities and equipment. Every eligible school and teacher in the target population had a known, positive probability of being sampled.

The sample design involved clustering and stratification prior to sample selection. The first stage units consisted of elementary and secondary schools. Science, mathematics, and computer science teachers constituted the second stage units. The target sample sizes were designed to be large enough to allow sub-domain estimates, such as for particular regions or types of community.

The sampling frame for the school sample was constructed from the Common Core of Data and Private School Survey databases—programs of the U.S. Department of Education's National Center for Education Statistics—which include school name and address and information about the school needed for stratification and sample selection. The sampling frame for the teacher sample was constructed from lists provided by sample schools, identifying current teachers and the specific science, mathematics, and computer science subjects they were teaching.

Because biology is by far the most common science course at the high school level, selecting a random sample of science teachers would result in a much larger number of biology teachers than chemistry or physics teachers. Similarly, random selection of mathematics teachers might result in a smaller than desired sample of teachers of advanced mathematics courses. In order to ensure that the sample would include a sufficient number of advanced science and mathematics teachers for separate analysis, information on teaching assignments was used to create separate domains (e.g., for teachers of chemistry and physics), and sampling rates were adjusted by domain. In addition, because the number of computer science teachers in high schools is small compared to the number of science and mathematics teachers, all high school teachers who taught computer science were sampled for that subject.

[1] Based on the recommendation of the project's Advisory Board, high school computer science was defined for this study as courses that teach programming or have programming as a prerequisite.

The study design included obtaining in-depth information from each teacher about curriculum and instruction in a single, randomly selected class. Most elementary teachers were reported to teach in self-contained classrooms; i.e., they were responsible for teaching all academic subjects to a single group of students. Each such sampled teacher was randomly assigned to 1 of 2 groups—science or mathematics—and received a questionnaire specific to that subject. Most secondary teachers in the sample taught several classes of a single subject. Some secondary teachers taught multiple subjects addressed by the study. If such a teacher taught high school computer science, s/he was selected to respond to the computer science questionnaire; if s/he taught science and mathematics, s/he was randomly assigned to receive the science or mathematics teacher questionnaire. In addition, for all teachers responsible for more than one class in their designated subject area, one class was randomly selected.

Whenever a sample is anything other than a simple random sample of a population, the results must be weighted to take the sample design into account. In the 2018 NSSME+, the weight for each respondent was calculated as the inverse of the probability of selecting the individual into the sample multiplied by a non-response adjustment factor.[2] In the case of data about a randomly selected class, the teacher weight was adjusted to reflect the number of classes taught in that subject, and therefore, the probability of a particular class being selected. Detailed information about the sample design, weighting procedures, and non-response adjustments used in the 2018 NSSME+ can be found in Appendix A of the Report of the 2018 NSSME+.[3]

The results of any survey based on a sample of a population (rather than on the entire population) are subject to sampling variability. The sampling error (or standard error) provides a measure of the range within which a sample estimate can be expected to fall a certain proportion of the time. For example, it may be estimated that 7 percent of all elementary mathematics lessons involve the use of computers. If it is determined that the sampling error for this estimate was 1 percent, then according to the Central Limit Theorem, 95 percent of all possible samples of that same size selected in the same way would yield computer usage estimates between 5 percent and 9 percent (that is, 7 percent ± 2 standard error units).

In survey research, the decision to obtain information from a sample rather than from the entire population is made in the interest of reducing costs, in terms of both money and the burden on the population to be surveyed. The particular sample design chosen is the one that is expected to yield the most accurate information for the least cost. It is important to realize that, other things being equal, estimates based on small sample sizes are subject to larger standard errors than those based on large samples. Also, for the same sample design and sample size, the closer a percentage is to zero or 100, the smaller the standard error. The standard errors for the estimates presented in this report are included in parentheses in the tables. All population estimates presented in this report were computed using weighted data.

---

[2] The aim of non-response adjustments is to reduce possible bias by distributing the non-respondent weights among the respondents expected to be most similar to these non-respondents. In this study, adjustment was made by region, school metro status, grade level, type (public, catholic, other private), and student body race/ethnicity.

[3] Banilower, E. R., Smith, P. S., Malzahn, K. A., Plumley, C. L., Gordon, E. M., & Hayes, M. L. (2018). *Report of the 2018 NSSME+*. Chapel Hill, NC: Horizon Research, Inc.

Instrument Development

Because one purpose of the 2018 NSSME+ was to identify trends in science and mathematics education, the process of developing survey instruments began with the questionnaires that were used in the 2012 NSSME. The project's Advisory Board, composed of experienced researchers in computer science, science, and mathematics education, reviewed the 2012 questionnaires and made recommendations about retaining or deleting particular items. Additional items that were needed to provide important information about the current status of computer science, science, and mathematics education were also considered.

Preliminary drafts of the questionnaires were sent to the professional organizations that endorsed the study for review, including the American Federation of Teachers, the Computer Science Teachers Association, the National Council of Teachers of Mathematics, the National Education Association, and the National Science Teachers Association.

The survey instruments were revised based on feedback from the various reviewers, field tested, and revised again. The instrument development process was lengthy, constantly compromising between information needs and data collection constraints. There were several iterations, including rounds of cognitive interviews with teachers and revisions to help ensure that individual items were clear and unambiguous and that the survey as a whole would provide the necessary information with the least possible burden on participants. Lastly, because of the large number of questions stakeholders (e.g., advisors, endorsers) wanted to include in the study, all teachers sampled for science or mathematics teacher responded to a core set of items plus 1 of 3 sets of items randomly assigned to respondents. The relatively small sample size of high school computer science teachers would not support random assignment of items, thus these teachers were presented only with core items. Copies of the questionnaires are included in this compendium.

Data Collection

HRI secured permission for the study from education officials at various levels. First, notification letters were mailed to the Chief State School Officers. Similar letters were subsequently mailed to superintendents of districts including sampled public schools and diocesan offices of sampled Catholic schools, identifying the schools in the district that had been selected for the survey. (Information about this pre-survey mail-out is included in Appendix B of the Report of the 2018 NSSME+.) Copies of the survey instruments and additional information about the study were provided when requested.

Principals received a mailing asking them to log on to the study website and designate a school contact person or "school coordinator." The school coordinator designation page was designed to confirm the principal's contact information, as well as to obtain the name, title, phone number, and email address of the coordinator. (The mailing also included a printed copy of the form and postage-paid return envelope.) Of the 2,000 target slots, 1,273 schools were successfully recruited; 41 slots were ineligible (e.g., the school had closed, should have been excluded from the sampling frame, merged with another school already in the sample). Thus, 65 percent of eligible slots were filled.

An incentive system was developed to encourage school and teacher participation in the survey. School coordinators were offered an honorarium of up to $200 ($100 for completing a teacher list and school questionnaire, $15 for completing each program questionnaire (optional), and $10 for each completed teacher questionnaire). Teachers were offered a $25 honorarium for completing the teacher questionnaire.

Survey invitation letters were mailed to teachers beginning in February 2018. In addition to the incentives described, phone calls and emails to school coordinators were used to encourage non-respondents to complete the questionnaires. In May 2018, a final questionnaire invitation mailing was sent to teachers who had not yet completed their questionnaires. The teacher response rate was 78 percent. The response rate for the school-level questionnaires was 86 percent. A detailed description of the data collection procedures is included in Appendix B of the Report of the 2018 NSSME+.

Outline of This Compendium

The remainder of this compendium of tables of the 2018 NSSME+ is organized into six sections. Section Two contains tables from the School Coordinator Questionnaire completed by school coordinators. Sections Three and Four contain tables from the Science Program Questionnaire and the Mathematics Program Questionnaire completed by program representatives at each school. Sections Five, Six, and Seven consist of tables from the Science Teacher Questionnaire, Mathematics Teacher Questionnaire, and Computer Science Teacher Questionnaire completed by teachers. The corresponding questionnaires appear prior to the tables in each section.

Table numbers correspond to the questionnaire item numbers. Results are expressed in terms of percentages or means, with standard errors in parentheses. Teachers were classified by grade range according to the information they provided. Elementary was defined as grades K–5 plus 6^{th} grade self-contained; middle was defined as 6^{th} grade non-self-contained and grades 7–8; high was defined as grades 9–12. At the school level, elementary school was defined as any school containing grade K, 1, 2, 3, 4, and/or 5; middle school was defined as any school containing grade 6, 7, and/or 8; and high school was defined as any school containing grade 9, 10, 11, and/or 12.

School Coordinator Questionnaire
School Coordinator Questionnaire Tables

2018 NSSME+
School Coordinator Questionnaire

1. How many students are currently enrolled in each of the following grades in your school?

	NUMBER OF STUDENTS
Pre-Kindergarten	
Kindergarten	
1st grade	
2nd grade	
3rd grade	
4th grade	
5th grade	
6th grade	
7th grade	
8th grade	
9th grade	
10th grade	
11th grade	
12th grade	
Ungraded	

2. Please indicate the number of students in this school in each of the following categories: (Please count each student only once.)

	NUMBER OF STUDENTS
American Indian or Alaska Native	
Asian	
Black or African American	
Hispanic/Latino	
Native Hawaiian or Other Pacific Islander	
White	
Two or more races	

3. Of the students in this school, how many…

	NUMBER OF STUDENTS
a. are eligible for free or reduced-price lunch?	
b. have an Individualized Education Plan (IEP)?	
c. are classified as English-language learners?	

4. ***[High schools only]***
   Does your school use block scheduling (class periods scheduled to create extended blocks of instructional time) to organize most classes? *Select one.*

○	Yes
○	No

5. ***[High schools only]***
   Does your school offer courses in which students can earn credit toward graduation in multiple subjects for the same course? *Select one.*

○	Yes
○	No ***[Skip to Question 7]***

6. ***[High schools only]***
   For which of the following combinations of subjects does your school offer these courses? *Select all that apply.*

☐	a.	Mathematics and science
☐	b.	Mathematics and computer science
☐	c.	Science and computer science
☐	d.	None of these combinations

7. ***[High schools only]***
   In each of the following subjects, does your school allow students to demonstrate mastery of course content for credit in a course without the normal seat-time requirement? *Select one on each row.*

		YES	NO
a.	Computer science	○	○
b.	Mathematics	○	○
c.	Science	○	○

8. Does your school have… *Select one on each row.*

		YES	NO
a.	One or more computer labs available for teachers to schedule for their classes?	○	○
b.	Laptop/tablet carts available for teachers to use with their classes?	○	○
c.	A 1-to-1 initiative (every student is provided with a laptop or tablet)?	○	○
d.	School-wide Wi-Fi?	○	○

9. Which of the following best describes your school's policy about students using their own computing devices in classes? *Select one.*

○	Students are required to provide their own laptops or tablets for use in classes.
○	Students are not required, but are allowed to bring their own laptops or tablets for use in classes.
○	Students are not allowed to use their own laptops or tablets in classes.

10. Do any teachers in your school travel among different rooms because of a shortage of classrooms? *Select one.*

○	Yes
○	No ***[Skip to Question 12]***

11. Does your school ensure that teachers in their first year of teaching do not have to travel among different classrooms? *Select one.*

○	Yes
○	No

12. Does your school/district/diocese have a formal induction program for teachers new to the profession (support that is not offered to other teachers in the school)? *Select one.*

○	Yes
○	No ***[Skip to Question 17]***

13. How long does a teacher typically receive support from the induction program? *Select one.*

○	One year or less
○	2 years
○	3 or more years

14. Which of the following organizations are involved in developing and implementing the induction program? *Select all that apply.*

☐	a.	School
☐	b.	District/Diocese (if applicable)
☐	c.	Regional or county educational service
☐	d.	Local university
☐	e.	Other; please specify __________

15. Which of the following supports are provided as part of the formal induction program? *Select all that apply.*

☐	a.	Release time to attend national, state, or local teacher conferences
☐	b.	Financial support to attend national, state, or local teacher conferences
☐	c.	Common planning time with experienced teachers who teach the same subject or grade level
☐	d.	Release time to observe other teachers in their grade/subject area
☐	e.	Formally assigned school-based mentor teachers
☐	f.	District/diocese-based or university-based mentors
☐	g.	Reduced course load
☐	h.	Reduced class size
☐	i.	Reduced number of teaching preps
☐	j.	A meeting to orient them to school/district/diocese policies and practices
☐	k.	Professional development opportunities on teaching their subject
☐	l.	Professional development opportunities on providing instruction that meets the needs of students from the cultural backgrounds represented in your school
☐	m.	Classroom aides/teaching assistants
☐	n.	Supplemental funding for classroom supplies

16. ***[For schools that select Question 15e only]***

Are formally assigned school-based mentor teachers in your school's induction program… *Select one on each row.*

		YES	NO
a.	given extra compensation for being a mentor?	○	○
b.	intentionally given release time or a reduced course load to work with their mentee?	○	○
c.	given training on effective mentoring practices?	○	○
d.	required to attend workshops with their mentees?	○	○
e.	when feasible, intentionally assigned to beginning teachers who teach the same subject or grade level?	○	○
f.	when feasible, intentionally given common planning time with their mentees?	○	○

Computer Science Programs and Practices

17. Indicate whether your school does each of the following to enhance students' interest and/or achievement in computer science. *Select one on each row.*

		YES	NO
a.	Holds family computer science nights	○	○
b.	Offers after-school help in computer science (for example: tutoring)	○	○
c.	Offers formal after-school programs for enrichment in computer science	○	○
d.	Offers one or more computer science clubs	○	○
e.	Participates in Hour of Code	○	○
f.	Participates in a local or regional computer science fair	○	○
g.	Has one or more teams participating in computer science competitions (for example: USA Computer Science Olympiad)	○	○
h.	Encourages students to participate in computer science summer programs or camps offered by community colleges, universities, museums or computer science centers	○	○
i.	Coordinates visits to business, industry, and/or research sites related to computer science	○	○
j.	Coordinates meetings with adult mentors who work in computer science fields	○	○
k.	*[High schools only]* Coordinates internships in computer science fields	○	○

18. ***[Elementary and middle schools only]***
Does your school provide computer programming (for example: LOGO, Python, Scratch, Snap!) instruction to any or all students during the regular school day? *Select one.*

○	Yes
○	No *[Skip to Question 30]*

19. Omitted – Item did not function properly.

20. Omitted – Item did not function properly.

21. Omitted – Item did not function properly.

22. ***[High schools only]***
In which of the following ways can grades 9–12 students in this school take a computer science course that teaches programming or requires programming as a prerequisite? *Select all that apply.*

☐	a.	From a teacher in this school
☐	b.	Through virtual courses offered by other schools/institutions (for example: online, videoconference)
☐	c.	By going to a Career and Technical Education (CTE) center
☐	d.	By going to another high school
☐	e.	By going to a college or university
☐	f.	Grades 9-12 students in this school cannot take a computer science course that teaches programming or requires programming as a prerequisite *[If selected, skip to Question 30]*

23. ***[High schools only]***
Does your school offer each of the following types of computer science courses that might qualify for college credit? Include both courses that are offered every year and those offered in alternating years. *Select one on each row.*

		YES	NO
a.	Advanced Placement (AP) computer science courses	○	○
b.	International Baccalaureate (IB) computer science courses	○	○
c.	Concurrent college and high school credit/dual enrollment computer science courses *[If no, skip to Question 25]*	○	○

24. ***[High schools only]***
When are concurrent college and high school credit/dual enrollment computer science courses offered in this school? *Select one.*

○	Offered this school year
○	Not offered this school year, but offered in alternating years

25. ***[High schools only]***
Which of the following computer science courses are available to students in this school? For each course that is available, indicate where and when it is offered. *Select one on each row in each section, if applicable.*

		AVAILABLE?		[IF AVAILABLE] WHERE OFFERED		[IF AVAILABLE] WHEN OFFERED	
		YES	NO	AT THIS SCHOOL	ELSEWHERE (OFFSITE OR ONLINE)	THIS YEAR	NOT THIS YEAR, BUT IN ALTERNATING YEARS
a.	AP Computer Science A	○	○	○	○	○	○
b.	AP Computer Science Principles	○	○	○	○	○	○
c.	IB Computer science standard level	○	○	○	○	○	○
d.	IB Computer science higher level	○	○	○	○	○	○
e.	Other IB computer science course	○	○	○	○	○	○

26. *[High schools only]*
Is your school offering any computer science courses in the following categories this school year for students in any grades 9–12? *Select one on each row.*

GRADES 9–12 COURSE TYPE	EXAMPLE COURSES	YES	NO
a. Computer technology courses that do <u>not</u> include programming	Computer literacy, Keyboarding, Media technology (digital video/audio, multimedia presentations, digital arts), Desktop publishing, Computer applications (word processing, spreadsheets, slide presentations), Computer repair and computer networking, Web design, Computer-aided design (architectural drawing, fashion design), Other technology courses that do not teach or require programming	○	○
b. Introductory high school computer science courses <u>that include programming but do not qualify for college credit</u>	Computer Science Discoveries on code.org, Exploring computer science, PLTW's Computer Science Essentials, introductory programming course, IB Computer Science–Standard Level, Computer science elective that includes introductory programming	○	○
c. Specialized/elective computer science courses with programming as a prerequisite <u>that do not qualify for college credit</u>	Advanced Computer science electives such as Robotics, Game or mobile app development, or other advanced computer science elective with programming as a prerequisite	○	○

27. *[High schools only; skip if no computer science courses that teach programming or have programming as a prerequisite are offered this year]*
Approximately how many students in grades 9–12 in this school will take a computer science course this year that includes programming or has programming as a prerequisite?

NUMBER OF STUDENTS

Computer Science Requirements

28. *[High schools only]*
In order to graduate from this high school, how many years of computer science are grades 9–12 students required to take? *Select one.*

○	0 years
○	½ year
○	1 year
○	2 years
○	3 years
○	4 years

29. *[High schools only]*
Can computer science courses count towards students' high school graduation requirements in each of the following subject areas? *Select one on each row.*

	YES	NO
a. Mathematics	○	○
b. Science	○	○
c. Foreign language	○	○

Computer Science Professional Development

30. **In the last three years**, has your school and/or district/diocese offered **workshops** specifically focused on computer science or computer science teaching, possibly in conjunction with other organizations (for example: other school districts/dioceses, colleges or universities, museums, professional associations, commercial vendors)? *Select one.*

○	Yes
○	No

31. **In the last three years**, has your school and/or district/diocese offered **teacher study groups** where teachers meet on a regular basis to discuss teaching and learning of computer science, and possibly other content areas as well (sometimes referred to as Professional Learning Communities, PLCs, or lesson study)? *Select one.*

○	Yes
○	No

32. Do any teachers in your school have access to **one-on-one coaching** focused on improving their computer science instruction (include voluntary and/or required coaching)? *Select one.*

○	Yes
○	No

Thank you!

School Coordinator Questionnaire Tables

There is no table for SCQ 1.

There is no table for SCQ 2.

There is no table for SCQ 3.

Table SCQ 4 and 5
Prevalence of High School Course Arrangements

	PERCENT OF SCHOOLS
Block Schedule	33 (2.4)
Dual Credit Courses	19 (2.4)

Table SCQ 6
Prevalence of High School Dual Credit Course Arrangements

	PERCENT OF SCHOOLS
Mathematics and science	9 (2.2)
Mathematics and computer science	4 (1.2)
Science and computer science	2 (1.1)
None of these combinations	8 (1.4)

Table SCQ 7
Subjects for Which High School Students May Demonstrate Mastery of Course Content for Credit Without Normal Seat-Time Requirement

	PERCENT OF SCHOOLS
Computer science	10 (1.6)
Mathematics	27 (2.4)
Science	24 (2.5)

Table SCQ 8
Schools With Various Computing Resources, by Grade Range

	PERCENT OF SCHOOLS		
	ELEMENTARY	MIDDLE	HIGH
One or more computer labs available for teachers to schedule for their classes	69 (2.9)	68 (3.2)	74 (2.7)
Laptop/tablet carts available for teachers to use with their classes	89 (1.7)	87 (1.9)	76 (2.5)
A 1-to-1 initiative (every student is provided with a laptop or tablet)	35 (2.4)	40 (2.9)	44 (3.2)
School-wide Wi-Fi	98 (0.8)	99 (0.4)	99 (0.4)

Table SCQ 9
Schools With Various Policies About Students Bringing Their Own Computing Devices to School, by Grade Range

	PERCENT OF SCHOOLS		
	ELEMENTARY	MIDDLE	HIGH
Students are required to provide their own laptops or tablets for use in classes.	0 (0.1)	1 (0.3)	2 (0.7)
Students are not required, but are allowed to bring their own laptops or tablets for use in classes.	22 (3.0)	37 (3.4)	70 (3.9)
Students are not allowed to use their own laptops or tablets in classes.	78 (3.0)	63 (3.5)	27 (3.8)

Table SCQ 10
Teachers Traveling Among Rooms Due to a Shortage of Classrooms

	PERCENT OF SCHOOLS
Elementary	16 (2.3)
Middle	24 (2.5)
High	39 (2.6)

Table SCQ 11
Schools With Policy That First Year Teachers Do Not Travel Among Classrooms†

	PERCENT OF SCHOOLS
Elementary	42 (8.0)
Middle	39 (6.7)
High	21 (4.1)

† Includes only schools indicating in Q10 that they have teachers travel among classrooms.

Table SCQ 12
Schools With Induction Program for New Teachers

	PERCENT OF SCHOOLS
Elementary	74 (2.4)
Middle	69 (2.7)
High	68 (2.9)

Table SCQ 13
Typical Duration of Formal New Teacher Induction Programs†

	PERCENT OF SCHOOLS		
	ELEMENTARY	MIDDLE	HIGH
One year or less	44 (3.5)	43 (3.4)	47 (2.9)
2 years	35 (3.3)	40 (3.5)	34 (2.7)
3 or more years	21 (2.7)	17 (2.3)	19 (2.4)

† Includes only schools indicating in Q12 that they offer a formal new teacher induction program.

Table SCQ 14
Organizations Developing and Implementing Formal Induction Programs, by Grade Range

	PERCENT OF SCHOOLS		
	ELEMENTARY	MIDDLE	HIGH
School	63 (2.8)	68 (3.4)	78 (2.6)
District/Diocese†	86 (2.2)	80 (2.6)	74 (2.6)
Regional or county educational service	15 (2.8)	20 (3.4)	21 (3.1)
Local university	3 (1.2)	4 (1.0)	5 (1.4)
Other	4 (1.2)	5 (1.2)	6 (1.4)

† This item was presented only to public and Catholic schools.

Table SCQ 15
Supports Provided as Part of Formal Induction Programs, by Grade Range

	PERCENT OF SCHOOLS		
	ELEMENTARY	MIDDLE	HIGH
Release time to attend national, state, or local teacher conferences	33 (3.0)	38 (3.1)	51 (3.2)
Financial support to attend national, state, or local teacher conferences	22 (2.8)	23 (3.1)	35 (3.1)
Common planning time with experienced teachers who teach the same subject or grade level	76 (2.6)	68 (3.4)	52 (3.3)
Release time to observe other teachers in their grade/subject area	70 (3.1)	67 (3.2)	61 (2.9)
Formally assigned school-based mentor teachers	85 (2.0)	81 (2.8)	84 (2.5)
District/diocese-based or university-based mentors	30 (2.5)	30 (3.0)	26 (2.5)
Reduced course load	2 (0.9)	3 (1.3)	4 (1.4)
Reduced class size	0 (0.3)	1 (0.4)	3 (1.1)
Reduced number of teaching preps	1 (0.9)	6 (1.5)	13 (1.6)
A meeting to orient them to school/district/diocese policies and practices	88 (2.2)	85 (2.9)	89 (1.9)
Professional development opportunities on teaching their subject	80 (2.5)	82 (2.5)	74 (2.7)
Professional development opportunities on providing instruction that meets the needs of students from the cultural backgrounds represented in your school	44 (3.1)	43 (3.6)	48 (3.0)
Classroom aides/teaching assistants	14 (2.3)	12 (2.1)	15 (1.9)
Supplemental funding for classroom supplies	31 (3.2)	29 (3.0)	25 (2.4)

Table SCQ 16
Policies Regarding Formally Assigned School-Based Mentors in Induction Programs, by Grade Range

	PERCENT OF SCHOOLS†		
	ELEMENTARY	MIDDLE	HIGH
Given extra compensation for being a mentor	66 (3.4)	61 (3.3)	63 (2.9)
Intentionally given release time or a reduced course load to work with their mentee	25 (3.0)	22 (3.2)	25 (3.1)
Given training on effective mentoring practices	66 (3.3)	61 (3.8)	66 (2.9)
Required to attend workshops with their mentees	38 (3.4)	38 (3.8)	36 (2.8)
When feasible, intentionally assigned to beginning teachers who teach the same subject or grade level	88 (2.5)	90 (2.0)	86 (2.4)
When feasible, intentionally given common planning time with their mentees	71 (3.2)	65 (3.6)	64 (3.5)

† Includes only schools indicating in Q15 that they offer formally assigned school-based mentor teachers.

Table SCQ 17
School Programs and Practices to Enhance Students' Interest and/or Achievement in Computer Science, by Grade Range

	PERCENT OF SCHOOLS		
	ELEMENTARY	MIDDLE	HIGH
Holds family computer science nights	15 (2.0)	8 (1.5)	5 (1.0)
Offers after-school help in computer science (e.g., tutoring)	14 (1.8)	20 (2.1)	31 (2.8)
Offers formal after-school programs for enrichment in computer science	21 (2.3)	21 (2.6)	15 (1.8)
Offers one or more computer science clubs	22 (2.4)	25 (2.3)	29 (2.2)
Participates in Hour of Code	38 (2.8)	34 (2.8)	27 (2.6)
Participates in a local or regional computer science fair	11 (1.9)	13 (2.1)	12 (1.5)
Has one or more teams participating in computer science competitions (e.g., USA Computer Science Olympiad)	6 (1.3)	10 (1.5)	15 (1.6)
Encourages students to participate in computer science summer programs or camps offered by community colleges, universities, museums or computer science centers	38 (2.9)	44 (3.3)	51 (2.6)
Coordinates visits to business, industry, and/or research sites related to computer science	14 (2.3)	22 (2.8)	30 (3.0)
Coordinates meetings with adult mentors who work in computer science fields	14 (2.0)	18 (2.1)	22 (1.9)
Coordinates internships in computer science fields†	n/a	n/a	15 (1.7)

† This item was presented only to high schools.

Table SCQ 18
Elementary and Middle Schools Offering Computer Programming Instruction

	PERCENT OF SCHOOLS
Elementary	28 (2.5)
Middle	31 (2.6)

There is no table for SCQ 19.

There is no table for SCQ 20.

There is no table for SCQ 21.

Table SCQ 22
Computer Science Course-Offering Practices Currently Being Implemented in High Schools

	PERCENT OF SCHOOLS
From a teacher in this school	52 (2.7)
Through virtual courses offered by other schools/institutions (e.g., online, videoconference)	35 (2.6)
By going to a Career and Technical Education (CTE) center	24 (2.5)
By going to another high school	9 (1.8)
By going to a college or university	30 (2.4)
Grades 9-12 students in this school cannot take a computer science course that teaches programming or requires programming as a prerequisite	21 (2.5)

Table SCQ 23
High Schools Offering Computer Science Courses That Might Qualify for College Credit

	PERCENT OF SCHOOLS
Advanced Placement (AP) computer science courses	21 (1.6)
International Baccalaureate (IB) computer science courses	1 (0.4)
Concurrent college and high school credit/dual enrollment computer science courses	19 (1.9)

Table SCQ 24
When High Schools Offer Concurrent College and High School Credit/Dual Enrollment Computer Science Courses

	PERCENT OF SCHOOLS†
Offered this school year	87 (4.0)
Not offered this school year, but offered in alternating years	13 (4.0)

† Includes only schools indicating in Q23 that they offer concurrent college and high school credit/dual enrollment computer science courses.

Table SCQ 25
Where and When High Schools Offer Various Advanced Placement and International Baccalaureate Computer Science Courses

	PERCENT OF SCHOOLS					
	AVAILABLE?		WHERE OFFERED†		WHEN OFFERED†	
	Yes	No	At this school	Elsewhere (offsite or online)	This year	Not this year, but in alternating years
AP Computer Science A	16 (1.4)	84 (1.4)	84 (4.5)	16 (4.5)	91 (2.8)	9 (2.8)
AP Computer Science Principles	14 (1.5)	86 (1.5)	90 (4.2)	10 (4.2)	88 (3.1)	12 (3.1)
IB Computer science standard level	1 (0.4)	99 (0.4)	100 (0.0)	0 ---‡	100 (0.0)	0 ---‡
IB Computer science higher level	0 (0.2)	100 (0.2)	100 (0.0)	0 ---‡	68 (19.4)	32 (19.4)
Other IB computer science course	0 (0.1)	100 (0.1)	100 (0.0)	0 ---‡	100 (0.0)	0 ---‡

† Includes only schools indicating AP and/or IB course availability.

‡ No high schools in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table SCQ 26
High School Computer Science and Technology Courses Offered

	PERCENT OF SCHOOLS
Computer technology courses that do not include programming	47 (2.4)
Introductory high school computer science courses that include programming but do not qualify for college credit	36 (2.4)
Specialized/elective computer science courses with programming as a prerequisite that do not qualify for college credit	21 (1.7)

Table SCQ 27
Average Percentage of High School Students That Will Take a Computer Science Class This Year

	AVERAGE PERCENT OF STUDENTS
High school students that will take a computer science class this year	6 (0.8)

Table SCQ 28
High School Computer Science Graduation Requirements

	PERCENT OF SCHOOLS
0 years	74 (3.1)
½ year	8 (1.9)
1 year	17 (2.9)
2 years	0 (0.1)
3 years	0 (0.1)
4 years	0 (0.4)

Table SCQ 29
High School Computer Science Counting Toward Graduation Requirements in Other Subject Areas

	PERCENT OF SCHOOLS
Mathematics	15 (2.0)
Science	12 (2.0)
Foreign language	7 (2.0)

Table SCQ 30
Computer Science-Focused Professional Development Workshops Offered by School/District in the Last Three Years

	PERCENT OF SCHOOLS
Elementary	35 (2.5)
Middle	28 (2.4)
High	19 (1.9)

Table SCQ 31
Computer Science-Focused Teacher Study Groups Offered by School/District in the Last Three Years

	PERCENT OF SCHOOLS
Elementary	43 (3.1)
Middle	41 (3.3)
High	33 (2.9)

Table SCQ 32
Schools Providing One-on-One Computer Science-Focused Coaching

	PERCENT OF SCHOOLS
Elementary	28 (2.4)
Middle	27 (2.3)
High	21 (2.3)

Science Program Questionnaire
Science Program Questionnaire Tables

2018 NSSME+

Science Program Questionnaire

This questionnaire asks a number of questions about teachers of science. In responding, unless otherwise specified, consider ALL teachers of science in your school, including self-contained teachers who teach science and other subjects to the same group of students all or most of the day.

1. Which of the following describe your position? [Select all that apply.]

□	Science department chair
□	Science lead teacher or coach
□	Science/STEM specialist
□	Regular classroom teacher
□	Principal
□	Assistant principal
□	Other (please specify: _______________)

School Programs and Practices

2. *[Presented only to schools that include self-contained teachers]*
Indicate whether each of the following programs and/or practices is currently being implemented in your school. [Select one on each row.]

		YES	NO
a.	Students in self-contained classes receive science instruction from a district/diocese/school science specialist instead of their regular teacher.	○	○
b.	Students in self-contained classes receive science instruction from a district/diocese/school science specialist in addition to their regular teacher.	○	○
c.	Students in self-contained classes receive science instruction on a regular basis from someone outside of the school district/diocese (for example: museum staff).	○	○
d.	Students in self-contained classes pulled out for remedial instruction in science.	○	○
e.	Students in self-contained classes pulled out for enrichment in science.	○	○
f.	Students in self-contained classes pulled out from science instruction for additional instruction in other content areas.	○	○

3. *[Presented only to schools that include any grades 9–12]*
Indicate whether each of the following programs and/or practices is currently being implemented in your school. [Select one on each row.]

		YES	NO
a.	Physics courses offered this school year or in alternating years, on or off site.	○	○
b.	Students can go to a Career and Technical Education (CTE) Center for science and/or engineering instruction.	○	○
c.	This school provides students access to virtual science and/or engineering courses offered by other schools/institutions (for example: online, videoconference).	○	○
d.	This school provides its own science and/or engineering courses virtually (for example: online, videoconference).	○	○
e.	Students can go to another K–12 school for science and/or engineering courses.	○	○
f.	Students can go to a college or university for science and/or engineering courses.	○	○

4. Indicate whether your school does each of the following to enhance students' interest and/or achievement in science and/or engineering. [Select one on each row.]

		YES	NO
a.	Holds family science and/or engineering nights	○	○
b.	Offers after-school help in science and/or engineering (for example: tutoring)	○	○
c.	Offers formal after-school programs for enrichment in science and/or engineering	○	○
d.	Offers one or more science clubs	○	○
e.	Offers one or more engineering clubs	○	○
f.	Participates in a local or regional science and/or engineering fair	○	○
g.	Has one or more teams participating in science competitions (for example: Science Olympiad)	○	○
h.	Has one or more teams participating in engineering competitions (for example: Robotics)	○	○
i.	Encourages students to participate in science and/or engineering summer programs or camps (for example: offered by community colleges, universities, museums, or science centers)	○	○
j.	Coordinates visits to business, industry, and/or research sites related to science and/or engineering	○	○
k.	Coordinates meetings with adult mentors who work in science and/or engineering fields	○	○
l.	Coordinates internships in science and/or engineering fields	○	○

Your State Standards

5. Please provide your opinion about each of the following statements in regard to your current state standards for science. [Select one on each row.]

		STRONGLY DISAGREE	DISAGREE	NO OPINION	AGREE	STRONGLY AGREE
a.	State science standards have been thoroughly discussed by science teachers in this school.	①	②	③	④	⑤
b.	There is a school-wide effort to align science instruction with the state science standards.	①	②	③	④	⑤
c.	Most science teachers in this school teach to the state standards.	①	②	③	④	⑤
d.	This school/district/diocese organizes science professional development based on state standards.	①	②	③	④	⑤

Science Courses Offered in Your School

6. *[Presented only to schools that include any grades 6–8]*
   What types of science courses are offered to students in the following grades? [Select one on each row.]

	SINGLE-DISCIPLINE SCIENCE COURSES (FOR EXAMPLE: LIFE SCIENCE)	MULTI-DISCIPLINE SCIENCE COURSES (FOR EXAMPLE: GENERAL SCIENCE, INTEGRATED SCIENCE)	BOTH SINGLE-DISCIPLINE AND MULTI-DISCIPLINE SCIENCE COURSES
6th Grade	○	○	○
7th Grade	○	○	○
8th Grade	○	○	○

7. *[Presented only to schools that include any grades 9–12]*
   Approximately how many students in grades 9–12 in this school will **not** take a science course this year? [Enter your response as a whole number (for example: 1500).]
   ____

[Questions 8–13 presented only to schools that include any grades 9–12; schools that do not include any of these grades skip to Q14]

8. Is your school offering any courses in each of the following categories **this year** for students in grades 9–12? [Select one on each row.]

	YES	NO
a. Coordinated/Integrated/Interdisciplinary science (including General Science and Physical Science)		
i. Non-college prep	○	○
ii. College prep, including honors	○	○
b. Earth/Space Science		
i. Non-college prep	○	○
ii. 1st year college prep, including honors	○	○
iii. 2nd year advanced, including concurrent college and high school credit/dual enrollment courses	○	○
c. Life Science/Biology		
i. Non-college prep	○	○
ii. 1st year college prep, including honors	○	○
iii. 2nd year advanced, including Advanced Placement, International Baccalaureate, and concurrent college and high school credit/dual enrollment courses	○	○
d. Environmental Science/Ecology		
i. Non-college prep	○	○
ii. 1st year college prep, including honors	○	○
iii. 2nd year advanced, including Advanced Placement, International Baccalaureate, and concurrent college and high school credit/dual enrollment courses	○	○
e. Chemistry		
i. Non-college prep	○	○
ii. 1st year college prep, including honors	○	○
iii. 2nd year advanced, including Advanced Placement, International Baccalaureate, and concurrent college and high school credit/dual enrollment courses	○	○
f. Physics		
i. Non-college prep	○	○
ii. 1st year college prep, including honors	○	○
iii. 2nd year advanced, including Advanced Placement, International Baccalaureate, and concurrent college and high school credit/dual enrollment courses	○	○
g. Engineering—Include courses that address the nature of engineering, engineering design processes, technological systems, or technology and society. Do not include career-technical education (CTE) courses that cover such things as automotive repair, audio/video production, etc.		
i. Non-college prep	○	○
ii. 1st year college prep, including honors	○	○
iii. 2nd year advanced, including concurrent college and high school credit/dual enrollment courses	○	○

9. Does your school offer each of the following types of science courses that might qualify for college credit? (Include both courses that are offered every year and those offered in alternating years.) [Select one on each row.]

		YES	NO
a.	Advanced Placement (AP) science courses	○	○
b.	International Baccalaureate (IB) science courses	○	○
c.	Concurrent college and high school credit/dual enrollment science courses	○	○

10. ***[Presented only to schools that selected "Yes" for Q9c]***
When are concurrent college and high school credit/dual enrollment science courses offered?

○	Offered this school year
○	Not offered this school year, but offered in alternating years

11. Which of the following science courses are available to students in this school, either on site, at other locations, or online? [Select one on each row.]

	AVAILABLE		*[IF AVAILABLE]* WHERE OFFERED		*[IF AVAILABLE]* WHEN OFFERED	
	YES	NO	AT THIS SCHOOL	ELSEWHERE (OFFSITE OR ONLINE)	THIS YEAR	NOT THIS YEAR, BUT IN ALTERNATING YEARS
a. *[Skip if Q9a was "No"]* AP Biology	○	○	○	○	○	○
b. *[Skip if Q9a was "No"]* AP Chemistry	○	○	○	○	○	○
c. *[Skip if Q9a was "No"]* AP Physics 1	○	○	○	○	○	○
d. *[Skip if Q9a was "No"]* AP Physics 2	○	○	○	○	○	○
e. *[Skip if Q9a was "No"]* AP Physics C: Electricity and Magnetism	○	○	○	○	○	○
f. *[Skip if Q9a was "No"]* AP Physics C: Mechanics	○	○	○	○	○	○
g. *[Skip if Q9a was "No"]* AP Environmental Science	○	○	○	○	○	○
h. *[Skip if Q9b was "No"]* IB Biology	○	○	○	○	○	○
i. *[Skip if Q9b was "No"]* IB Chemistry	○	○	○	○	○	○
j. *[Skip if Q9b was "No"]* IB Physics	○	○	○	○	○	○
k. *[Skip if Q9b was "No"]* IB Environmental Systems and Societies	○	○	○	○	○	○

Science Requirements

12. ***[Presented only to schools that include grade 12]***
In order to graduate from this high school, how many years of grades 9–12 science are students required to take?

1 YEAR	2 YEARS	3 YEARS	4 YEARS
○	○	○	○

13. *[Presented only to schools that include grade 12]*
Does participation in Engineering courses count towards students' high school graduation requirements for science?

○	Yes
○	No

Influences on Science Instruction

14. For this school, how much money was spent on each of the following during the most recently completed budget year? (If you don't know the exact amounts, please provide your best estimates.) [Enter each response as a whole dollar amount without special characters such as dollar signs (for example: 1500).]

a.	Consumable supplies for science instruction (for example: chemicals, living organisms, batteries)	
b.	Science equipment (non-consumable, non-perishable items such as microscopes, scales, etc., but not computers)	
c.	Software for science instruction	

15. Which of the following best describes how the science instructional materials used in your school are selected?
[Select one.]

○	At the district/diocese level (for example: by a science supervisor or district/diocese-wide committee) *[Not presented to non-Catholic private schools]*
○	At the school level (for example: by the principal, department chair, or teacher committee/grade-level team)
○	By individual teachers

16. Please rate the effect of each of the following on the quality of science instruction in your school. [Select one on each row.]

		INHIBITS EFFECTIVE INSTRUCTION		NEUTRAL OR MIXED		PROMOTES EFFECTIVE INSTRUCTION
a.	The school/district/diocese science professional development policies and practices	①	②	③	④	⑤
b.	The amount of time provided by the school/district/diocese for teacher professional development in science	①	②	③	④	⑤
c.	The importance that the school places on science	①	②	③	④	⑤
d.	Other school and/or district/diocese initiatives	①	②	③	④	⑤
e.	The amount of time provided by the school/district/diocese for teachers to share ideas about science instruction	①	②	③	④	⑤
f.	How science instructional resources are managed (for example: distributing and refurbishing materials)	①	②	③	④	⑤

17. In your opinion, how great a problem is each of the following for science instruction **in your school as a whole**? [Select one on each row.]

		NOT A SIGNIFICANT PROBLEM	SOMEWHAT OF A PROBLEM	SERIOUS PROBLEM
a.	Lack of science facilities (for example: lab tables, electric outlets, faucets and sinks in classrooms)	①	②	③
b.	Inadequate funds for purchasing science equipment and supplies	①	②	③
c.	Lack of science textbooks/modules	①	②	③
d.	Poor quality science textbooks/modules	①	②	③
e.	Inadequate materials for differentiating science instruction	①	②	③
f.	Low student interest in science	①	②	③
g.	Low student prior knowledge and skills	①	②	③
h.	Lack of teacher interest in science	①	②	③
i.	Inadequate teacher preparation to teach science	①	②	③
j.	High teacher turnover	①	②	③
k.	Insufficient instructional time to teach science	①	②	③
l.	Inadequate science-related professional development opportunities	①	②	③
m.	Large class sizes	①	②	③
n.	High student absenteeism	①	②	③
o.	Inappropriate student behavior	①	②	③
p.	Lack of parent/guardian support and involvement	①	②	③
q.	Community resistance to the teaching of "controversial" issues in science (for example: evolution, climate change)	①	②	③

Science Professional Development Opportunities

18. **In the last 3 years**, has your school and/or district/diocese offered **workshops** specifically focused on science/engineering or science/engineering teaching, possibly in conjunction with other organizations (for example: other schools/districts/dioceses, colleges or universities, museums, professional associations, commercial vendors)?

○	Yes
○	No *[Skip to Q20]*

19. Please indicate the extent to which **workshops** offered by your school and/or district/diocese **in the last 3 years** emphasized each of the following: [Select one on each row.]

		NOT AT ALL		SOMEWHAT		TO A GREAT EXTENT
a.	Deepening teachers' understanding of science concepts	①	②	③	④	⑤
b.	Deepening teachers' understanding of how science is done (for example: developing scientific questions, developing and using models, engaging in argumentation)	①	②	③	④	⑤
c.	Deepening teachers' understanding of how engineering is done (for example: identifying criteria and constraints, designing solutions, optimizing solutions)	①	②	③	④	⑤
d.	Deepening teachers' understanding of the state science standards	①	②	③	④	⑤
e.	Deepening teachers' understanding of how students think about various science ideas	①	②	③	④	⑤
f.	How to use particular science/engineering instructional materials (for example: textbooks or modules)	①	②	③	④	⑤
g.	How to monitor student understanding during science instruction	①	②	③	④	⑤
h.	How to adapt science instruction to address student misconceptions	①	②	③	④	⑤
i.	How to use technology in science instruction	①	②	③	④	⑤
j.	How to develop students' confidence that they can successfully pursue careers in science/engineering	①	②	③	④	⑤
k.	How to incorporate real-world issues (for example: current events, community concerns) into science instruction	①	②	③	④	⑤
l.	How to connect instruction to science/engineering career opportunities	①	②	③	④	⑤
m.	How to integrate science, engineering, mathematics, and/or computer science	①	②	③	④	⑤
n.	How to engage students in doing science (for example: developing scientific questions, developing and using models, engaging in argumentation)	①	②	③	④	⑤
o.	How to engage students in doing engineering (for example: identifying criteria and constraints, designing solutions, optimizing solutions)	①	②	③	④	⑤
p.	How to incorporate students' cultural backgrounds into science instruction	①	②	③	④	⑤
q.	How to differentiate science instruction to meet the needs of diverse learners	①	②	③	④	⑤

20. **In the last 3 years**, has your school offered **teacher study groups** where teachers meet on a regular basis to discuss teaching and learning of science/engineering, and possibly other content areas as well (sometimes referred to as Professional Learning Communities, PLCs, or lesson study)?

○	Yes
○	No *[Skip to Q32]*

21. ***[Presented only to schools that include any grades K–*5]**

Typically, are teachers of grades K–5 science required to participate in these science/engineering-focused **teacher study groups**?

○	Yes, all teachers of grades K–5 science
○	Yes, but only science/STEM specialists
○	No

22. ***[Presented only to schools that include any grades 6–8]***
Typically, are teachers of grades 6–8 science classes required to participate in these science/engineering-focused **teacher study groups**?

○	Yes
○	No

23. ***[Presented only to schools that include any grades 9–12]***
Typically, are teachers of grades 9–12 science classes required to participate in these science/engineering-focused **teacher study groups**?

○	Yes
○	No

24. Has your school specified a schedule for when these science/engineering-focused **teacher study groups** are expected to meet?

○	Yes
○	No ***[Skip to Q27]***

25. Over what period of time have these science/engineering-focused **teacher study groups** typically been expected to meet?

○	The entire school year
○	One semester
○	Less than one semester

26. How often have these science/engineering-focused teacher study groups typically been expected to meet?

○	Less than once a month
○	Once a month
○	Twice a month
○	More than twice a month

27. Which of the following describe the typical science/engineering-focused **teacher study groups** in this school? [Select all that apply.]

□	Organized by grade level
□	Include teachers from multiple grade levels
□	Include teachers who teach different science/engineering subjects
□	Include parents/guardians or other community members
□	Include higher education faculty or other "consultants"
□	Include school and/or district/diocese administrators
□	Limited to teachers from this school
□	Include teachers from other schools in the district/diocese ***[Not presented to non-Catholic private schools]***
□	Include teachers from other schools outside of your district/diocese

28. Which of the following describe the typical science/engineering-focused **teacher study groups** in this school? [Select all that apply.]

□	Teachers engage in science investigations.
□	Teachers engage in engineering design challenges.
□	Teachers analyze student science assessment results.
□	Teachers analyze science/engineering instructional materials (for example: textbooks or modules).
□	Teachers plan science/engineering lessons together.
□	Teachers rehearse instructional practices (meaning: try out, receive feedback, and reflect on those practices).
□	Teachers observe each other's science/engineering instruction (either in-person or through video recording).
□	Teachers provide feedback on each other's science/engineering instruction.
□	Teachers examine classroom artifacts (for example: student work samples, videos of classroom instruction).

29. To what extent have these science/engineering-focused **teacher study groups** emphasized each of the following? [Select one on each row.]

		NOT AT ALL		SOMEWHAT		TO A GREAT EXTENT
a.	Deepening teachers' understanding of science concepts	①	②	③	④	⑤
b.	Deepening teachers' understanding of how science is done (for example: developing scientific questions, developing and using models, engaging in argumentation)	①	②	③	④	⑤
c.	Deepening teachers' understanding of how engineering is done (for example: identifying criteria and constraints, designing solutions, optimizing solutions)	①	②	③	④	⑤
d.	Deepening teachers' understanding of the state science standards	①	②	③	④	⑤
e.	Deepening teachers' understanding of how students think about various science ideas	①	②	③	④	⑤
f.	How to use particular science/engineering instructional materials (for example: textbooks or modules)	①	②	③	④	⑤
g.	How to monitor student understanding during science/engineering instruction	①	②	③	④	⑤
h.	How to adapt science instruction to address student misconceptions	①	②	③	④	⑤
i.	How to use technology in science instruction	①	②	③	④	⑤
j.	How to develop students' confidence that they can successfully pursue careers in science/engineering	①	②	③	④	⑤
k.	How to incorporate real-world issues (for example: current events, community concerns) into science instruction	①	②	③	④	⑤
l.	How to connect instruction to science/engineering career opportunities	①	②	③	④	⑤
m.	How to integrate science, engineering, mathematics, and/or computer science	①	②	③	④	⑤
n.	How to engage students in doing science (for example: developing scientific questions, developing and using models, engaging in argumentation)	①	②	③	④	⑤
o.	How to engage students in doing engineering (for example: identifying criteria and constraints, designing solutions, optimizing solutions)	①	②	③	④	⑤
p.	How to incorporate students' cultural backgrounds into science instruction	①	②	③	④	⑤
q.	How to differentiate science instruction to meet the needs of diverse learners	①	②	③	④	⑤

30. Have there been designated leaders for these science/engineering-focused **teacher study groups**?

○	Yes
○	No *[Skip to Q32]*

31. The designated leaders of these science/engineering-focused **teacher study groups** were from: [Select all that apply.]

□	This school
□	Elsewhere in this district/diocese ***[Not presented to non-Catholic private schools]***
□	College/University
□	External consultants
□	Other (please specify: _________________)

32. Thinking about last school year, which of the following were used to provide teachers in this school with time for professional development workshops/teacher study groups that included a focus on science/engineering and/or science/engineering teaching, regardless of whether they were offered by your school and/or district/diocese? [Select all that apply.]

□	Early dismissal and/or late start for students
□	Professional days/teacher work days during the students' school year
□	Professional days/teacher work days before and/or after the students' school year
□	Common planning time for teachers
□	Substitute teachers to cover teachers' classes while they attend professional development
□	None of the above

33. Do any teachers in your school have access to **one-on-one coaching** focused on improving their science instruction (include voluntary and required coaching)?

○	Yes
○	No ***[Skip to Q36]***

34. This school year, how many teachers in this school have received one-on-one coaching focused on improving their science instruction (include voluntary and required coaching)? [Enter response as a whole number (for example: 15)] ______________________

35. To what extent is one-on-one coaching focused on improving science instruction provided by each of the following? [Select one on each row.]

		NOT AT ALL		SOMEWHAT		TO A GREAT EXTENT
a.	The principal of your school	①	②	③	④	⑤
b.	An assistant principal at your school	①	②	③	④	⑤
c.	District/Diocese administrators including science supervisors/coordinators ***[Not presented to non-Catholic private schools]***	①	②	③	④	⑤
d.	Teachers/coaches who do not have classroom teaching responsibilities	①	②	③	④	⑤
e.	Teachers/coaches who have part-time classroom teaching responsibilities	①	②	③	④	⑤
f.	Teachers/coaches who have full-time classroom teaching responsibilities	①	②	③	④	⑤

36. Which of the following are provided to teachers considered in need of special assistance in science teaching? [Select all that apply.]

☐	Seminars, classes, and/or study groups
☐	Guidance from a formally designated mentor or coach
☐	A higher level of supervision than for other teachers
☐	None of the above

Thank you!

Science Program Questionnaire Tables

Table SPQ 1
Titles of Science Program Questionnaire Representatives, by Grade Range

	PERCENT OF REPRESENTATIVES		
	ELEMENTARY	MIDDLE	HIGH
Science department chair	9 (1.4)	27 (2.2)	56 (3.0)
Science lead teacher or coach	21 (2.3)	25 (3.0)	20 (2.6)
Science/STEM specialist	8 (1.3)	12 (1.8)	6 (1.4)
Regular classroom teacher	56 (3.4)	62 (3.2)	67 (2.8)
Principal	13 (2.0)	10 (2.2)	5 (1.6)
Assistant principal	5 (1.6)	4 (2.1)	2 (0.7)
Other	15 (2.0)	10 (1.7)	11 (2.1)

Table SPQ 2
Use of Various Instructional Arrangements in Elementary Schools

	PERCENT OF SCHOOLS†
Students in self-contained classes receive science instruction from a science specialist *instead of* their regular teacher.	7 (1.8)
Students in self-contained classes receive science instruction from a science specialist *in addition* to their regular teacher.	15 (2.1)
Students in self-contained classes receive science instruction on a regular basis from someone outside of the school/district/diocese (e.g., museum staff).	3 (1.2)
Students in self-contained classes pulled out for remedial instruction in science	8 (1.7)
Students in self-contained classes pulled out for enrichment in science	10 (1.8)
Students in self-contained classes pulled out from science instruction for additional instruction in other content areas	28 (2.9)

† Includes only elementary schools that contain self-contained teachers.

Table SPQ 3
Science Programs and Practices
Currently Being Implemented in High Schools

	PERCENT OF SCHOOLS
Physics courses offered this school year or in alternating years, on or off site.	87 (2.8)
Students can go to a Career and Technical Education (CTE) Center for science and/or engineering instruction.	41 (2.3)
This school provides students access to virtual science and/or engineering courses offered by other schools/institutions (e.g., online, videoconference).	41 (3.4)
This school provides its own science and/or engineering courses virtually (e.g., online, videoconference).	15 (2.1)
Students can go to another K–12 school for science and/or engineering courses.	17 (2.1)
Students can go to a college or university for science and/or engineering courses.	54 (3.0)

Table SPQ 4
School Programs and Practices to Enhance Students' Interest and/or Achievement in Science/Engineering, by Grade Range

	PERCENT OF SCHOOLS		
	ELEMENTARY	MIDDLE	HIGH
Holds family science and/or engineering nights	44 (3.0)	34 (3.0)	19 (2.3)
Offers after-school help in science and/or engineering (e.g., tutoring)	31 (2.7)	51 (2.9)	79 (2.9)
Offers formal after-school programs for enrichment in science and/or engineering	32 (2.7)	39 (2.9)	32 (2.5)
Offers one or more science clubs	36 (3.2)	45 (3.7)	54 (3.5)
Offers one or more engineering clubs	28 (2.5)	36 (2.9)	35 (2.6)
Participates in a local or regional science and/or engineering fair	40 (2.8)	48 (3.2)	46 (3.6)
Has one or more teams participating in science competitions (e.g., Science Olympiad)	17 (2.0)	29 (2.9)	43 (3.0)
Has one or more teams participating in engineering competitions (e.g., Robotics)	24 (2.4)	35 (2.9)	47 (3.0)
Encourages students to participate in science and/or engineering summer programs or camps offered by community colleges, universities, museums, or science centers	68 (2.8)	73 (2.9)	78 (3.3)
Coordinates visits to business, industry, and/or research sites related to science and/or engineering	39 (2.9)	45 (3.7)	55 (3.0)
Coordinates meetings with adult mentors who work in science and/or engineering fields	26 (2.8)	34 (3.0)	39 (2.9)
Coordinates internships in science and/or engineering fields	n/a	n/a	24 (2.4)

Table SPQ 5.1
Opinions About Various Statements Regarding State Science Standards in Elementary Schools

	PERCENT OF SCHOOLS				
	STRONGLY DISAGREE	DISAGREE	NO OPINION	AGREE	STRONGLY AGREE
State science standards have been thoroughly discussed by science teachers in this school.	9 (1.6)	19 (2.1)	7 (1.6)	40 (3.0)	24 (2.9)
There is a school-wide effort to align science instruction with the state science standards.	7 (1.5)	14 (2.3)	7 (1.7)	39 (3.0)	32 (2.8)
Most science teachers in this school teach to the state standards.	4 (1.2)	9 (1.7)	9 (1.8)	49 (3.0)	30 (2.7)
This school/district/diocese organizes science professional development based on state standards.	10 (2.0)	21 (2.7)	14 (2.1)	33 (3.1)	22 (2.5)

Table SPQ 5.2
Opinions About Various Statements Regarding State Science Standards in Middle Schools

	PERCENT OF SCHOOLS				
	STRONGLY DISAGREE	DISAGREE	NO OPINION	AGREE	STRONGLY AGREE
State science standards have been thoroughly discussed by science teachers in this school.	6 (1.2)	11 (2.2)	7 (2.0)	35 (3.2)	41 (3.2)
There is a school-wide effort to align science instruction with the state science standards.	5 (1.4)	9 (2.3)	7 (2.0)	31 (3.0)	47 (3.1)
Most science teachers in this school teach to the state standards.	3 (0.8)	6 (1.7)	8 (2.0)	42 (3.4)	42 (3.1)
This school/district/diocese organizes science professional development based on state standards.	6 (1.5)	21 (3.0)	12 (2.1)	32 (3.4)	29 (2.9)

Table SPQ 5.3
Opinions About Various Statements Regarding State Science Standards in High Schools

	PERCENT OF SCHOOLS				
	STRONGLY DISAGREE	DISAGREE	NO OPINION	AGREE	STRONGLY AGREE
State science standards have been thoroughly discussed by science teachers in this school.	4 (1.0)	8 (2.0)	11 (2.7)	38 (3.2)	40 (3.5)
There is a school-wide effort to align science instruction with the state science standards.	4 (1.1)	9 (2.2)	10 (2.9)	34 (3.0)	43 (3.1)
Most science teachers in this school teach to the state standards.	3 (0.9)	5 (1.6)	7 (2.3)	43 (3.2)	41 (3.4)
This school/district/diocese organizes science professional development based on state standards.	11 (2.1)	17 (2.1)	15 (2.6)	36 (3.3)	21 (2.1)

Table SPQ 6
Type of Middle School Science Courses Offered, by Grade

	PERCENT OF SCHOOLS†		
	6TH GRADE	7TH GRADE	8TH GRADE
Single-discipline science courses (e.g., life science)	35 (3.5)	40 (3.8)	40 (3.7)
Multi-discipline science courses (e.g., general science, integrated science)	45 (3.5)	41 (3.5)	42 (3.4)
Both single-discipline and multi-discipline science courses	19 (3.2)	18 (3.0)	18 (2.9)

† Includes all schools containing the specified grade.

Table SPQ 7
Average Percentage of High School Students Not Taking Science During the 2017–18 School Year

	AVERAGE PERCENT OF STUDENTS
9^{th}–12^{th} grade students in the school not taking a science course	13 (0.8)

Table SPQ 8
High School Science Courses Offered

	PERCENT OF SCHOOLS
Coordinated/Integrated/Interdisciplinary science (including General Science and Physical Science)	
Non-college prep	70 (2.6)
College prep, including honors	46 (3.4)
Earth/Space Science	
Non-college prep	47 (3.6)
1st year college prep, including honors	23 (2.5)
2nd year advanced, including concurrent college and high school credit/dual enrollment courses	6 (1.2)
Life Science/Biology	
Non-college prep	70 (3.0)
1st year college prep, including honors	73 (3.4)
2nd year advanced, including Advanced Placement, International Baccalaureate, and concurrent college and high school credit/dual enrollment courses	60 (3.8)
Environmental Science/Ecology	
Non-college prep	44 (3.5)
1st year college prep, including honors	26 (2.5)
2nd year advanced, including Advanced Placement, International Baccalaureate, and concurrent college and high school credit/dual enrollment courses	27 (2.4)
Chemistry	
Non-college prep	58 (3.0)
1st year college prep, including honors	72 (3.3)
2nd year advanced, including Advanced Placement, International Baccalaureate, and concurrent college and high school credit/dual enrollment courses	45 (3.3)
Physics	
Non-college prep	45 (3.4)
1st year college prep, including honors	60 (3.2)
2nd year advanced, including Advanced Placement, International Baccalaureate, and concurrent college and high school credit/dual enrollment courses	40 (2.8)
Engineering	
Non-college prep	31 (2.7)
1st year college prep, including honors	29 (2.5)
2nd year advanced, including concurrent college and high school credit/dual enrollment courses	17 (2.1)

Table SPQ 9
High Schools Offering Science Courses That Might Qualify for College Credit

	PERCENT OF SCHOOLS
Advanced Placement (AP) science courses	51 (3.8)
International Baccalaureate (IB) science courses	3 (0.7)
Concurrent college and high school credit/dual enrollment science courses	46 (3.2)

Table SPQ 10
When High Schools Offer Concurrent College and High School Credit/Dual Enrollment Science Courses

	PERCENT OF SCHOOLS
Offered this school year	96 (1.7)
Not offered this school year, but offered in alternating years	4 (1.7)

† Includes only schools indicating in Q9 that they offer concurrent college and high school credit/dual enrollment science courses.

Table SPQ 11
Where and When High Schools Offer Various Advanced Placement and International Baccalaureate Science Courses

	PERCENT OF SCHOOLS					
	AVAILABLE?		WHERE OFFERED†		WHEN OFFERED†	
	Yes	No	At this school	Elsewhere (offsite or online)	This year	Not this year, but in alternating years
AP Biology	43 (3.1)	57 (3.1)	95 (2.3)	5 (2.3)	96 (1.5)	4 (1.5)
AP Chemistry	36 (2.8)	64 (2.8)	94 (2.5)	6 (2.5)	89 (2.3)	11 (2.3)
AP Physics 1	31 (2.9)	69 (2.9)	92 (2.7)	8 (2.7)	86 (3.0)	14 (3.0)
AP Physics 2	13 (1.7)	87 (1.7)	89 (5.6)	11 (5.6)	91 (3.1)	9 (3.1)
AP Physics C: Electricity and Magnetism	8 (1.2)	92 (1.2)	93 (4.2)	7 (4.2)	89 (3.7)	11 (3.7)
AP Physics C: Mechanics	12 (1.5)	88 (1.5)	95 (2.9)	5 (2.9)	88 (3.4)	12 (3.4)
AP Environmental Science	23 (2.4)	77 (2.4)	93 (2.6)	7 (2.6)	91 (3.0)	9 (3.0)
IB Biology	3 (0.7)	97 (0.7)	100 (0.0)	0 ---‡	97 (2.8)	3 (2.8)
IB Chemistry	2 (0.5)	98 (0.5)	100 (0.0)	0 ---‡	96 (3.8)	4 (3.8)
IB Physics	2 (0.6)	98 (0.6)	100 (0.0)	0 ---‡	86 (8.0)	14 (8.0)
IB Environmental Systems and Societies	2 (0.5)	98 (0.5)	100 (0.0)	0 ---‡	91 (10)	9 (10)

† Includes only schools indicating AP and/or IB course availability.

‡ No high schools in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table SPQ 12
High School Science Graduation Requirements

	PERCENT OF SCHOOLS†
1 year	0 (0.0)
2 years	14 (2.5)
3 years	66 (2.9)
4 years	20 (2.2)

† Includes only schools that contain grade 12.

Table SPQ 13
High Schools Counting Engineering Courses Towards Science Graduation Requirements

	PERCENT OF SCHOOLS†
Engineering counts towards science graduation requirements	21 (2.6)

† Includes only schools that contain grade 12.

Table SPQ 14
Median Amount Schools Spent Per Pupil on Consumable Supplies, Equipment, and Software for Science, by Grade Range

	MEDIAN AMOUNT		
	ELEMENTARY	MIDDLE	HIGH
Consumable supplies for science instruction (e.g., chemicals, living organisms, batteries)	$1.03 (0.2)	$1.42 (0.2)	$3.26 (0.3)
Science equipment (non-consumable, non-perishable items such as microscopes, scales, etc., but not computers)	$0.35 (0.1)	$1.02 (0.1)	$2.25 (0.3)
Software for science instruction	$0.00 ---†	$0.00 ---†	$0.00 ---†

† Standard errors for medians are typically computed in Wesvar 5.1 using the Woodruff method. Wesvar was unable to compute a standard error for this estimate using this method or the potentially less-consistent replication standard error method.

Table SPQ 15
How Science Instructional Materials Are Selected, by Grade Range

	PERCENT OF SCHOOLS		
	ELEMENTARY	MIDDLE	HIGH
At the district/diocese level (e.g., by a science supervisor or district/diocese-wide committee)†	40 (3.1)	24 (2.7)	12 (2.0)
At the school level (e.g., by the principal, department chair, or teacher committee/grade-level team)	27 (2.6)	34 (3.5)	30 (3.3)
By individual teachers	33 (2.9)	42 (3.4)	59 (3.4)

† This item was presented only to public and Catholic schools.

Table SPQ 16.1
Effect of Various Factors on Science Instruction in Elementary Schools

	PERCENT OF SCHOOLS				
	INHIBITS EFFECTIVE INSTRUCTION 1	2	NEUTRAL OR MIXED 3	4	PROMOTES EFFECTIVE INSTRUCTION 5
The school/district/diocese science professional development policies and practices	5 (1.3)	11 (1.8)	34 (2.7)	27 (2.6)	23 (2.3)
The amount of time provided by the school/district/diocese for teacher professional development in science	14 (2.1)	23 (2.8)	33 (3.3)	20 (2.5)	11 (1.8)
The importance that the school places on science	8 (1.5)	16 (2.1)	28 (3.1)	32 (3.1)	16 (2.0)
Other school and/or district/diocese initiatives	10 (1.7)	15 (2.3)	42 (2.7)	21 (2.6)	12 (1.8)
The amount of time provided by the school/district/diocese for teachers to share ideas about science instruction	14 (1.9)	26 (2.8)	29 (2.6)	21 (2.6)	10 (1.7)
How science instructional resources are managed (e.g., distributing and refurbishing materials)	11 (1.9)	13 (2.0)	29 (2.9)	30 (2.9)	17 (2.4)

Table SPQ 16.2
Effect of Various Factors on Science Instruction in Middle Schools

	PERCENT OF SCHOOLS				
	INHIBITS EFFECTIVE INSTRUCTION 1	2	NEUTRAL OR MIXED 3	4	PROMOTES EFFECTIVE INSTRUCTION 5
The school/district/diocese science professional development policies and practices	3 (1.1)	8 (1.9)	39 (3.5)	24 (2.6)	27 (2.6)
The amount of time provided by the school/district/diocese for teacher professional development in science	9 (1.9)	18 (3.0)	33 (3.4)	23 (3.1)	17 (2.0)
The importance that the school places on science	6 (1.3)	11 (1.7)	29 (3.2)	31 (2.8)	23 (2.4)
Other school and/or district/diocese initiatives	6 (1.2)	9 (2.0)	48 (3.4)	23 (3.3)	15 (1.9)
The amount of time provided by the school/district/diocese for teachers to share ideas about science instruction	8 (1.7)	19 (3.1)	32 (2.9)	27 (3.1)	14 (2.0)
How science instructional resources are managed (e.g., distributing and refurbishing materials)	8 (1.5)	13 (2.2)	31 (3.1)	28 (3.2)	20 (2.4)

Table SPQ 16.3
Effect of Various Factors on Science Instruction in High Schools

	PERCENT OF SCHOOLS				
	INHIBITS EFFECTIVE INSTRUCTION 1	2	NEUTRAL OR MIXED 3	4	PROMOTES EFFECTIVE INSTRUCTION 5
The school/district/diocese science professional development policies and practices	2 (0.6)	7 (1.7)	39 (3.4)	28 (3.3)	24 (2.7)
The amount of time provided by the school/district/diocese for teacher professional development in science	6 (1.4)	18 (2.6)	35 (3.2)	24 (2.6)	17 (2.7)
The importance that the school places on science	4 (1.4)	8 (1.6)	25 (2.6)	36 (3.3)	27 (3.0)
Other school and/or district/diocese initiatives	5 (1.7)	11 (2.1)	48 (3.0)	24 (2.7)	11 (1.8)
The amount of time provided by the school/district/diocese for teachers to share ideas about science instruction	7 (2.0)	20 (2.9)	31 (2.7)	28 (2.4)	14 (2.1)
How science instructional resources are managed (e.g., distributing and refurbishing materials)	5 (1.3)	8 (1.9)	34 (3.7)	31 (3.0)	21 (2.3)

Table SPQ 17.1
Science Program Representatives' Opinions About the Extent to Which Various Factors Are Problematic for Science Instruction in Elementary Schools

	PERCENT OF SCHOOLS		
	NOT A SIGNIFICANT PROBLEM	SOMEWHAT OF A PROBLEM	SERIOUS PROBLEM
Lack of science facilities (e.g., lab tables, electric outlets, faucets and sinks in classrooms)	42 (3.1)	39 (2.9)	19 (2.4)
Inadequate funds for purchasing science equipment and supplies	38 (2.7)	42 (2.9)	21 (2.7)
Lack of science textbooks/modules	54 (2.7)	32 (2.6)	14 (1.8)
Poor quality science textbooks/modules	51 (2.6)	30 (2.5)	19 (2.3)
Inadequate materials for differentiating science instruction	33 (2.6)	48 (3.1)	19 (2.0)
Low student interest in science	71 (2.7)	25 (2.6)	4 (0.9)
Low student prior knowledge and skills	36 (2.5)	47 (3.0)	17 (2.3)
Lack of teacher interest in science	54 (2.8)	38 (2.7)	8 (1.6)
Inadequate teacher preparation to teach science	41 (2.7)	43 (2.8)	16 (2.3)
High teacher turnover	69 (2.8)	24 (2.5)	7 (1.4)
Insufficient instructional time to teach science	29 (2.9)	38 (3.1)	32 (2.7)
Inadequate science-related professional development opportunities	24 (2.5)	52 (2.9)	24 (2.6)
Large class sizes	58 (2.7)	29 (2.4)	13 (1.9)
High student absenteeism	67 (2.3)	28 (2.3)	6 (1.3)
Inappropriate student behavior	57 (2.4)	29 (2.6)	14 (1.9)
Lack of parent/guardian support and involvement	55 (2.8)	29 (2.8)	15 (2.1)
Community resistance to the teaching of "controversial" issues in science (e.g., evolution, climate change)	84 (2.3)	14 (2.3)	2 (0.7)

Table SPQ 17.2

Science Program Representatives' Opinions About the Extent to Which Various Factors Are Problematic for Science Instruction in Middle Schools

	PERCENT OF SCHOOLS		
	NOT A SIGNIFICANT PROBLEM	SOMEWHAT OF A PROBLEM	SERIOUS PROBLEM
Lack of science facilities (e.g., lab tables, electric outlets, faucets and sinks in classrooms)	47 (3.0)	35 (2.3)	18 (2.4)
Inadequate funds for purchasing science equipment and supplies	40 (3.2)	42 (3.1)	18 (2.3)
Lack of science textbooks/modules	57 (3.5)	31 (3.1)	12 (1.5)
Poor quality science textbooks/modules	52 (2.9)	36 (2.7)	12 (1.6)
Inadequate materials for differentiating science instruction	41 (3.4)	43 (3.5)	16 (2.1)
Low student interest in science	56 (3.0)	36 (2.7)	8 (1.4)
Low student prior knowledge and skills	36 (3.2)	45 (3.4)	20 (2.4)
Lack of teacher interest in science	75 (3.3)	20 (3.0)	5 (1.4)
Inadequate teacher preparation to teach science	61 (3.0)	29 (2.9)	10 (2.2)
High teacher turnover	64 (3.0)	25 (2.8)	11 (2.1)
Insufficient instructional time to teach science	50 (3.3)	33 (2.9)	16 (2.3)
Inadequate science-related professional development opportunities	36 (3.3)	50 (3.2)	15 (2.5)
Large class sizes	54 (2.6)	32 (2.6)	14 (1.9)
High student absenteeism	61 (2.8)	29 (2.8)	11 (1.7)
Inappropriate student behavior	54 (2.4)	30 (2.5)	17 (2.1)
Lack of parent/guardian support and involvement	49 (2.5)	34 (2.5)	18 (2.5)
Community resistance to the teaching of "controversial" issues in science (e.g., evolution, climate change)	81 (2.8)	17 (2.8)	2 (1.0)

Table SPQ 17.3
Science Program Representatives' Opinions About the Extent to Which Various Factors Are Problematic for Science Instruction in High Schools

	PERCENT OF SCHOOLS		
	NOT A SIGNIFICANT PROBLEM	SOMEWHAT OF A PROBLEM	SERIOUS PROBLEM
Lack of science facilities (e.g., lab tables, electric outlets, faucets and sinks in classrooms)	59 (3.4)	29 (2.8)	12 (2.5)
Inadequate funds for purchasing science equipment and supplies	46 (2.9)	41 (3.4)	13 (2.5)
Lack of science textbooks/modules	63 (3.2)	26 (2.9)	10 (2.5)
Poor quality science textbooks/modules	56 (3.2)	32 (3.0)	12 (2.1)
Inadequate materials for differentiating science instruction	46 (3.0)	43 (3.0)	11 (2.7)
Low student interest in science	39 (3.3)	52 (3.4)	10 (1.6)
Low student prior knowledge and skills	25 (3.0)	54 (3.2)	21 (2.5)
Lack of teacher interest in science	87 (2.7)	12 (2.6)	2 (1.1)
Inadequate teacher preparation to teach science	73 (3.5)	21 (2.9)	6 (2.3)
High teacher turnover	63 (3.2)	26 (3.0)	11 (2.1)
Insufficient instructional time to teach science	55 (3.5)	36 (3.0)	9 (2.1)
Inadequate science-related professional development opportunities	39 (3.5)	48 (3.5)	12 (2.4)
Large class sizes	54 (3.3)	32 (2.9)	14 (1.8)
High student absenteeism	44 (3.5)	35 (3.8)	21 (2.8)
Inappropriate student behavior	58 (3.7)	30 (3.5)	12 (2.2)
Lack of parent/guardian support and involvement	37 (3.0)	46 (3.2)	17 (3.0)
Community resistance to the teaching of "controversial" issues in science (e.g., evolution, climate change)	79 (3.1)	17 (2.9)	3 (1.5)

Table SPQ 18
Science/Engineering-Focused Professional Development Workshops Offered by School/District in the Last Three Years

	PERCENT OF SCHOOLS
Elementary	51 (2.8)
Middle	48 (2.6)
High	41 (2.9)

Table SPQ 19.1
Elementary Schools With Locally Offered Science Professional Development Workshops in the Last Three Years With an Emphasis in Each of a Number of Areas

	PERCENT OF SCHOOLS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
Deepening teachers' understanding of science concepts	4 (1.8)	8 (2.1)	27 (3.3)	40 (4.5)	21 (3.7)
Deepening teachers' understanding of how science is done (e.g., developing scientific questions, developing and using models, engaging in argumentation)	4 (1.7)	11 (2.7)	23 (3.0)	41 (4.1)	20 (4.0)
Deepening teachers' understanding of how engineering is done (e.g., identifying criteria and constraints, designing solutions, optimizing solutions)	7 (2.2)	23 (3.5)	21 (3.6)	37 (4.7)	12 (2.9)
Deepening teachers' understanding of the state science standards	7 (2.0)	9 (2.2)	18 (2.9)	44 (3.9)	22 (3.3)
Deepening teachers' understanding of how students think about various science ideas	4 (1.7)	17 (2.9)	30 (3.8)	38 (4.0)	11 (2.8)
How to use particular science/engineering instructional materials (e.g., textbooks or modules)	7 (1.7)	15 (2.9)	31 (3.7)	34 (4.3)	14 (2.8)
How to monitor student understanding during science instruction	7 (2.1)	19 (3.3)	36 (3.7)	33 (4.2)	6 (2.0)
How to adapt science instruction to address student misconceptions	9 (2.1)	22 (3.1)	35 (4.5)	27 (4.0)	7 (2.1)
How to use technology in science instruction	10 (2.4)	15 (3.1)	30 (3.9)	36 (4.4)	10 (2.4)
How to develop students' confidence that they can successfully pursue careers in science/engineering	20 (3.3)	15 (2.8)	38 (3.9)	23 (3.5)	5 (1.7)
How to incorporate real-world issues (e.g., current events, community concerns) into science instruction	11 (2.4)	13 (2.6)	39 (4.3)	30 (3.5)	7 (1.7)
How to connect instruction to science/engineering career opportunities	19 (2.9)	17 (3.0)	30 (3.6)	28 (3.8)	7 (2.0)
How to integrate science, engineering, mathematics, and/or computer science	10 (2.6)	17 (2.9)	38 (3.6)	27 (4.1)	8 (2.1)
How to engage students in doing science (e.g., developing scientific questions, developing and using models, engaging in argumentation)	6 (1.9)	13 (2.6)	28 (3.7)	36 (4.0)	18 (3.1)
How to engage students in doing engineering (e.g., identifying criteria and constraints, designing solutions, optimizing solutions)	11 (2.7)	19 (3.2)	31 (3.8)	28 (3.6)	11 (2.5)
How to incorporate students' cultural backgrounds into science instruction	23 (3.3)	34 (3.7)	27 (3.2)	13 (2.8)	3 (1.4)
How to differentiate science instruction to meet the needs of diverse learners	14 (2.4)	28 (3.1)	34 (3.6)	19 (3.3)	6 (1.7)

† Includes only elementary schools indicating in Q18 that they and/or their district/diocese offered science-focused workshops in the last three years.

Table SPQ 19.2
Middle Schools With Locally Offered Science Professional Development Workshops in the Last Three Years With an Emphasis in Each of a Number of Areas

	PERCENT OF SCHOOLS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
Deepening teachers' understanding of science concepts	6 (1.8)	10 (2.8)	29 (3.6)	34 (4.5)	21 (4.0)
Deepening teachers' understanding of how science is done (e.g., developing scientific questions, developing and using models, engaging in argumentation)	4 (1.6)	13 (2.8)	27 (3.9)	35 (4.7)	22 (4.8)
Deepening teachers' understanding of how engineering is done (e.g., identifying criteria and constraints, designing solutions, optimizing solutions)	10 (2.4)	17 (3.1)	24 (3.4)	33 (4.8)	16 (3.8)
Deepening teachers' understanding of the state science standards	8 (2.8)	10 (2.9)	15 (3.0)	35 (4.1)	32 (4.1)
Deepening teachers' understanding of how students think about various science ideas	9 (2.8)	16 (3.6)	32 (4.0)	30 (4.4)	14 (3.4)
How to use particular science/engineering instructional materials (e.g., textbooks or modules)	11 (2.3)	16 (3.0)	31 (3.8)	27 (4.2)	15 (3.6)
How to monitor student understanding during science instruction	6 (2.0)	17 (3.4)	36 (4.1)	31 (4.0)	10 (2.7)
How to adapt science instruction to address student misconceptions	11 (2.8)	22 (3.9)	33 (4.5)	25 (4.3)	9 (2.8)
How to use technology in science instruction	8 (2.5)	13 (3.3)	29 (4.8)	35 (4.8)	15 (2.7)
How to develop students' confidence that they can successfully pursue careers in science/engineering	22 (3.0)	18 (3.1)	34 (4.4)	20 (3.9)	6 (2.2)
How to incorporate real-world issues (e.g., current events, community concerns) into science instruction	13 (2.9)	14 (2.9)	34 (4.9)	26 (3.6)	13 (2.5)
How to connect instruction to science/engineering career opportunities	17 (2.9)	17 (3.3)	34 (4.2)	24 (4.0)	8 (2.7)
How to integrate science, engineering, mathematics, and/or computer science	14 (3.2)	15 (3.3)	34 (4.6)	26 (3.7)	11 (2.9)
How to engage students in doing science (e.g., developing scientific questions, developing and using models, engaging in argumentation)	7 (2.0)	12 (3.1)	22 (4.0)	34 (4.4)	24 (3.9)
How to engage students in doing engineering (e.g., identifying criteria and constraints, designing solutions, optimizing solutions)	12 (2.9)	20 (4.0)	27 (4.3)	26 (3.6)	16 (3.5)
How to incorporate students' cultural backgrounds into science instruction	25 (3.6)	28 (3.9)	26 (3.9)	15 (3.6)	5 (2.2)
How to differentiate science instruction to meet the needs of diverse learners	10 (2.7)	28 (4.4)	30 (3.8)	22 (3.6)	10 (2.7)

† Includes only middle schools indicating in Q18 that they and/or their district/diocese offered science-focused workshops in the last three years.

Table SPQ 19.3
High Schools With Locally Offered Science Professional Development Workshops in the Last Three Years With an Emphasis in Each of a Number of Areas

	PERCENT OF SCHOOLS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
Deepening teachers' understanding of science concepts	9 (2.7)	11 (2.4)	32 (5.7)	35 (5.3)	13 (2.6)
Deepening teachers' understanding of how science is done (e.g., developing scientific questions, developing and using models, engaging in argumentation)	7 (2.6)	15 (4.8)	26 (4.8)	39 (4.9)	13 (2.8)
Deepening teachers' understanding of how engineering is done (e.g., identifying criteria and constraints, designing solutions, optimizing solutions)	13 (3.7)	25 (5.1)	32 (4.1)	20 (3.7)	11 (3.1)
Deepening teachers' understanding of the state science standards	7 (3.2)	12 (4.6)	19 (4.1)	33 (4.4)	30 (4.8)
Deepening teachers' understanding of how students think about various science ideas	14 (4.5)	13 (4.2)	34 (5.3)	29 (4.7)	9 (2.5)
How to use particular science/engineering instructional materials (e.g., textbooks or modules)	9 (2.3)	21 (4.9)	25 (3.8)	32 (4.8)	12 (4.0)
How to monitor student understanding during science instruction	12 (3.7)	9 (1.9)	41 (4.8)	29 (4.2)	9 (1.9)
How to adapt science instruction to address student misconceptions	20 (5.4)	19 (3.0)	26 (3.6)	28 (4.2)	7 (1.9)
How to use technology in science instruction	6 (2.2)	9 (3.9)	30 (4.3)	40 (5.1)	15 (3.0)
How to develop students' confidence that they can successfully pursue careers in science/engineering	28 (5.7)	22 (4.3)	30 (4.1)	17 (3.9)	3 (1.2)
How to incorporate real-world issues (e.g., current events, community concerns) into science instruction	17 (5.5)	15 (3.5)	32 (4.6)	29 (5.0)	7 (2.3)
How to connect instruction to science/engineering career opportunities	18 (5.4)	22 (4.3)	32 (4.9)	22 (3.7)	5 (1.6)
How to integrate science, engineering, mathematics, and/or computer science	19 (5.5)	19 (4.8)	32 (4.9)	22 (3.8)	8 (2.5)
How to engage students in doing science (e.g., developing scientific questions, developing and using models, engaging in argumentation)	14 (5.5)	9 (3.0)	31 (4.4)	34 (4.4)	12 (2.5)
How to engage students in doing engineering (e.g., identifying criteria and constraints, designing solutions, optimizing solutions)	18 (4.9)	26 (5.1)	33 (4.5)	17 (3.0)	6 (1.8)
How to incorporate students' cultural backgrounds into science instruction	27 (5.7)	28 (4.6)	24 (4.3)	17 (4.3)	5 (1.9)
How to differentiate science instruction to meet the needs of diverse learners	15 (5.2)	21 (4.1)	33 (5.4)	17 (2.9)	14 (3.4)

† Includes only high schools indicating in Q18 that they and/or their district/diocese offered science-focused workshops in the last three years.

Table SPQ 20
Science/Engineering-Focused Teacher Study Groups Offered by School in the Last Three Years

	PERCENT OF SCHOOLS
Elementary	28 (2.4)
Middle	45 (2.8)
High	45 (3.1)

Table SPQ 21
Required Participation in Science/ Engineering-Focused Teacher Study Groups in Elementary Schools

	PERCENT OF SCHOOLS†
All teachers of grades K–5 science	53 (5.5)
Only science/STEM specialists	14 (4.0)
No required participation	33 (5.2)

† Includes only schools indicating in Q20 that they offered science/engineering-focused teacher study groups in the last three years.

Table SPQ 22 and 23
Required Participation in Science/ Engineering-Focused Teacher Study Groups in Secondary Schools

	PERCENT OF SCHOOLS†
Middle	79 (3.7)
High	89 (2.0)

† Includes only schools indicating in Q20 that they offered science/engineering-focused teacher study groups in the last three years.

Table SPQ 24
Schools With Specified Schedule for Science/Engineering-Focused Teacher Study Groups

	PERCENT OF SCHOOLS†
Elementary	51 (5.2)
Middle	70 (4.3)
High	84 (2.6)

† Includes only schools indicating in Q20 that they offered science/engineering-focused teacher study groups in the last three years.

Table SPQ 25
Duration of Science/Engineering-Focused Teacher Study Groups, by Grade Range

	PERCENT OF SCHOOLS†		
	ELEMENTARY	MIDDLE	HIGH
The entire school year	69 (7.1)	85 (4.4)	90 (3.7)
One semester	23 (6.9)	11 (4.2)	7 (3.5)
Less than one semester	8 (3.9)	4 (1.9)	3 (1.2)

† Includes only schools indicating in Q20 that they offered science/engineering-focused teacher study groups in the last three years and indicating in Q24 that they have a specified schedule for these teacher study groups.

Table SPQ 26
Frequency of Science/Engineering-Focused Teacher Study Groups, by Grade Range

	PERCENT OF SCHOOLS†		
	ELEMENTARY	MIDDLE	HIGH
Less than once a month	36 (6.8)	22 (4.6)	16 (4.3)
Once a month	28 (7.0)	26 (4.2)	29 (4.7)
Twice a month	15 (5.4)	14 (3.5)	18 (2.9)
More than twice a month	21 (5.5)	38 (4.3)	37 (4.7)

† Includes only schools indicating in Q20 that they offered science/engineering-focused teacher study groups in the last three years and indicating in Q24 that they have a specified schedule for these teacher study groups.

Table SPQ 27
Composition of Science/Engineering-Focused Teacher Study Groups, by Grade Range

	PERCENT OF SCHOOLS†		
	ELEMENTARY	MIDDLE	HIGH
Organized by grade level	57 (4.9)	55 (4.4)	34 (3.8)
Include teachers from multiple grade levels	58 (4.9)	72 (3.7)	68 (4.5)
Include teachers who teach different science/engineering subjects	25 (4.5)	49 (4.5)	67 (4.8)
Include parents/guardians or other community members	0 (0.4)	0 (0.4)	1 (0.8)
Include higher education faculty or other "consultants"	11 (3.8)	14 (3.2)	9 (2.3)
Include school and/or district/diocese administrators	48 (5.2)	48 (4.1)	40 (3.8)
Limited to teachers from this school	44 (5.5)	55 (4.8)	67 (4.5)
Include teachers from other schools in the district/diocese‡	33 (5.1)	25 (4.0)	20 (3.7)
Include teachers from other schools outside of your district/diocese	7 (3.2)	3 (2.1)	3 (1.9)

† Includes only schools indicating in Q20 that they offered science/engineering-focused teacher study groups in the last three years.
‡ This item was presented only to public and Catholic schools.

Table SPQ 28
Description of Activities in
Science/Engineering-Focused Teacher Study Groups, by Grade Range

	PERCENT OF SCHOOLS†		
	ELEMENTARY	MIDDLE	HIGH
Teachers engage in science investigations	35 (5.8)	32 (4.7)	28 (3.9)
Teachers engage in engineering design challenges	24 (5.1)	16 (3.4)	13 (3.0)
Teachers analyze student science assessment results	50 (5.6)	73 (3.8)	79 (3.3)
Teachers analyze science/engineering instructional materials (e.g., textbooks or modules)	50 (4.8)	50 (4.0)	53 (4.7)
Teachers plan science/engineering lessons together	64 (5.1)	67 (4.0)	70 (3.8)
Teachers rehearse instructional practices (i.e., try out, receive feedback, and reflect on those practices)	24 (4.9)	26 (3.2)	21 (3.2)
Teachers observe each other's science/engineering instruction (either in-person or through video recording)	15 (3.9)	19 (3.5)	19 (2.6)
Teachers provide feedback on each other's science/engineering instruction	18 (4.0)	25 (3.5)	29 (3.8)
Teachers examine classroom artifacts (e.g., student work samples, videos of classroom instruction)	35 (5.2)	44 (4.1)	39 (3.7)

† Includes only schools indicating in Q20 that they offered science/engineering-focused teacher study groups in the last three years.

Table SPQ 29.1
Elementary School Science/Engineering-Focused Teacher Study Groups in the Last Three Years With an Emphasis in Each of a Number of Areas

	PERCENT OF SCHOOLS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
Deepening teachers' understanding of science concepts	12 (3.7)	10 (3.2)	30 (4.6)	30 (5.1)	18 (4.6)
Deepening teachers' understanding of how science is done (e.g., developing scientific questions, developing and using models, engaging in argumentation)	10 (3.1)	10 (3.4)	30 (4.8)	30 (4.9)	19 (4.7)
Deepening teachers' understanding of how engineering is done (e.g., identifying criteria and constraints, designing solutions, optimizing solutions)	18 (3.8)	14 (3.0)	27 (4.5)	28 (5.1)	13 (3.9)
Deepening teachers' understanding of the state science standards	4 (1.8)	6 (2.8)	22 (4.7)	44 (5.4)	23 (3.8)
Deepening teachers' understanding of how students think about various science ideas	7 (2.9)	11 (3.7)	38 (5.0)	26 (4.0)	18 (4.2)
How to use particular science/engineering instructional materials (e.g., textbooks or modules)	5 (2.3)	6 (2.1)	40 (4.7)	30 (5.1)	19 (4.0)
How to monitor student understanding during science/engineering instruction	7 (2.7)	12 (3.6)	37 (5.2)	31 (5.1)	13 (3.3)
How to adapt science instruction to address student misconceptions	8 (2.8)	17 (4.4)	38 (5.4)	20 (4.3)	17 (4.6)
How to use technology in science instruction	10 (3.5)	8 (2.6)	37 (5.6)	34 (5.6)	12 (3.4)
How to develop students' confidence that they can successfully pursue careers in science/engineering	24 (4.3)	17 (4.5)	34 (5.2)	18 (4.4)	7 (2.7)
How to incorporate real-world issues (e.g., current events, community concerns) into science instruction	9 (3.0)	17 (4.1)	30 (4.8)	25 (4.1)	19 (3.6)
How to connect instruction to science/engineering career opportunities	24 (4.6)	17 (4.5)	30 (4.9)	23 (4.9)	7 (2.8)
How to integrate science, engineering, mathematics, and/or computer science	9 (2.9)	17 (4.2)	30 (4.8)	32 (5.2)	12 (3.5)
How to engage students in doing science (e.g., developing scientific questions, developing and using models, engaging in argumentation)	11 (3.4)	3 (1.8)	29 (5.2)	34 (5.5)	22 (4.0)
How to engage students in doing engineering (e.g., identifying criteria and constraints, designing solutions, optimizing solutions)	15 (3.3)	22 (4.6)	21 (4.3)	30 (5.2)	13 (3.2)
How to incorporate students' cultural backgrounds into science instruction	32 (4.7)	23 (4.6)	27 (5.0)	12 (3.3)	6 (2.7)
How to differentiate science instruction to meet the needs of diverse learners	9 (3.1)	24 (4.8)	32 (4.8)	22 (4.2)	13 (3.4)

† Includes only elementary schools indicating in Q20 that they offered science/engineering-focused teacher study groups in the last three years

Table SPQ 29.2
Middle School Science/Engineering-Focused Teacher Study Groups in the Last Three Years With an Emphasis in Each of a Number of Areas

	PERCENT OF SCHOOLS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
Deepening teachers' understanding of science concepts	17 (3.4)	8 (1.8)	35 (3.7)	23 (3.9)	18 (4.1)
Deepening teachers' understanding of how science is done (e.g., developing scientific questions, developing and using models, engaging in argumentation)	13 (2.7)	11 (2.8)	28 (3.4)	31 (4.0)	18 (4.2)
Deepening teachers' understanding of how engineering is done (e.g., identifying criteria and constraints, designing solutions, optimizing solutions)	23 (3.8)	14 (2.0)	27 (3.8)	24 (4.0)	12 (3.4)
Deepening teachers' understanding of the state science standards	4 (1.1)	6 (2.2)	28 (4.1)	35 (4.1)	27 (3.4)
Deepening teachers' understanding of how students think about various science ideas	9 (2.3)	8 (1.9)	41 (4.0)	24 (3.4)	17 (3.3)
How to use particular science/engineering instructional materials (e.g., textbooks or modules)	9 (1.9)	10 (1.9)	32 (4.4)	32 (4.2)	17 (3.4)
How to monitor student understanding during science/engineering instruction	7 (1.8)	7 (1.8)	39 (4.1)	33 (3.8)	14 (2.8)
How to adapt science instruction to address student misconceptions	10 (2.5)	13 (2.6)	39 (4.0)	22 (2.8)	16 (4.0)
How to use technology in science instruction	11 (3.1)	7 (1.8)	36 (4.9)	31 (4.5)	15 (3.2)
How to develop students' confidence that they can successfully pursue careers in science/engineering	23 (3.5)	21 (3.4)	33 (4.4)	15 (2.7)	7 (2.5)
How to incorporate real-world issues (e.g., current events, community concerns) into science instruction	8 (2.4)	19 (2.9)	31 (4.0)	24 (3.3)	18 (3.3)
How to connect instruction to science/engineering career opportunities	22 (4.1)	21 (4.0)	31 (3.5)	18 (3.0)	7 (2.6)
How to integrate science, engineering, mathematics, and/or computer science	11 (2.6)	14 (2.9)	35 (4.5)	29 (3.9)	10 (2.8)
How to engage students in doing science (e.g., developing scientific questions, developing and using models, engaging in argumentation)	8 (2.4)	4 (1.4)	30 (3.9)	38 (4.0)	19 (2.7)
How to engage students in doing engineering (e.g., identifying criteria and constraints, designing solutions, optimizing solutions)	16 (2.9)	20 (3.9)	24 (3.5)	25 (3.5)	15 (2.9)
How to incorporate students' cultural backgrounds into science instruction	29 (3.5)	26 (3.7)	29 (4.0)	10 (2.0)	6 (2.4)
How to differentiate science instruction to meet the needs of diverse learners	7 (2.3)	20 (4.0)	34 (3.9)	26 (3.3)	13 (2.9)

† Includes only middle schools indicating in Q20 that they offered science/engineering-focused teacher study groups in the last three years

Table SPQ 29.3
High School Science/Engineering-Focused Teacher Study Groups in the Last Three Years With an Emphasis in Each of a Number of Areas

	PERCENT OF SCHOOLS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
Deepening teachers' understanding of science concepts	19 (4.0)	15 (2.4)	35 (3.7)	22 (3.8)	9 (2.0)
Deepening teachers' understanding of how science is done (e.g., developing scientific questions, developing and using models, engaging in argumentation)	15 (3.9)	13 (2.5)	35 (3.8)	27 (3.8)	10 (2.3)
Deepening teachers' understanding of how engineering is done (e.g., identifying criteria and constraints, designing solutions, optimizing solutions)	30 (4.6)	23 (3.2)	27 (4.1)	15 (2.8)	5 (1.6)
Deepening teachers' understanding of the state science standards	4 (1.2)	5 (1.4)	31 (5.0)	34 (4.2)	26 (4.4)
Deepening teachers' understanding of how students think about various science ideas	12 (4.0)	10 (2.2)	38 (3.9)	29 (4.1)	10 (2.0)
How to use particular science/engineering instructional materials (e.g., textbooks or modules)	13 (4.1)	15 (2.2)	34 (4.1)	31 (3.8)	8 (1.8)
How to monitor student understanding during science/engineering instruction	9 (4.1)	12 (2.4)	38 (4.4)	30 (3.7)	11 (1.6)
How to adapt science instruction to address student misconceptions	8 (1.7)	16 (4.0)	40 (4.3)	27 (3.8)	9 (1.8)
How to use technology in science instruction	9 (3.9)	10 (2.0)	32 (3.7)	37 (3.7)	12 (2.1)
How to develop students' confidence that they can successfully pursue careers in science/engineering	20 (4.1)	24 (3.5)	33 (3.9)	19 (3.3)	5 (1.6)
How to incorporate real-world issues (e.g., current events, community concerns) into science instruction	8 (2.0)	12 (2.3)	38 (4.1)	31 (4.1)	11 (2.1)
How to connect instruction to science/engineering career opportunities	18 (3.9)	22 (3.2)	40 (4.4)	15 (2.2)	6 (1.5)
How to integrate science, engineering, mathematics, and/or computer science	13 (2.2)	20 (2.9)	37 (4.4)	22 (2.8)	7 (1.5)
How to engage students in doing science (e.g., developing scientific questions, developing and using models, engaging in argumentation)	11 (3.9)	8 (2.1)	27 (4.0)	39 (4.2)	16 (2.3)
How to engage students in doing engineering (e.g., identifying criteria and constraints, designing solutions, optimizing solutions)	23 (4.4)	24 (3.6)	31 (4.3)	18 (2.8)	4 (1.4)
How to incorporate students' cultural backgrounds into science instruction	26 (4.2)	29 (3.6)	28 (4.2)	14 (2.9)	3 (1.1)
How to differentiate science instruction to meet the needs of diverse learners	5 (1.8)	17 (2.7)	37 (4.7)	32 (3.6)	9 (1.6)

† Includes only high schools indicating in Q20 that they offered science/engineering-focused teacher study groups in the last three years

Table SPQ 30
Use of Designated Leaders for Science/Engineering-Focused Teacher Study Groups

	PERCENT OF SCHOOLS†
Elementary	63 (5.0)
Middle	62 (3.9)
High	63 (4.4)

† Includes only schools indicating in Q20 that they offered science/engineering-focused teacher study groups in the last three years

Table SPQ 31
Origin of Designated Leaders of Science/Engineering-Focused Teacher Study Groups, by Grade Range

	PERCENT OF SCHOOLS†		
	ELEMENTARY	MIDDLE	HIGH
This school	42 (5.2)	51 (4.0)	58 (4.7)
Elsewhere in this district/diocese‡	22 (4.7)	18 (3.4)	9 (2.8)
College/University	0 ---§	0 ---§	2 (1.1)
External consultants	8 (3.3)	8 (3.1)	5 (1.9)
Other	6 (2.7)	1 (0.4)	2 (1.8)

† Includes only schools indicating in Q20 that they offered science/engineering-focused teacher study groups in the last three years and indicating in Q30 that they have designated leaders for these teacher study groups.

‡ This item was presented only to public and Catholic schools.

§ No schools in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table SPQ 32
How Schools Provide Time for Science Professional Development, by Grade Range

	PERCENT OF SCHOOLS		
	ELEMENTARY	MIDDLE	HIGH
Early dismissal and/or late start for students	19 (2.2)	27 (2.5)	36 (2.9)
Professional days/teacher work days during the students' school year	43 (3.2)	54 (3.5)	54 (3.2)
Professional days/teacher work days before and/or after the students' school year	37 (3.3)	44 (3.3)	46 (3.2)
Common planning time for teachers	41 (3.1)	40 (3.4)	33 (2.9)
Substitute teachers to cover teachers' classes while they attend professional development	26 (2.8)	36 (3.1)	38 (3.0)
None of the above	29 (3.0)	21 (3.2)	19 (2.4)

Table SPQ 33
Schools Providing One-on-One Science-Focused Coaching

	PERCENT OF SCHOOLS
Elementary	27 (2.7)
Middle	23 (2.7)
High	30 (3.0)

Table SPQ 34
Average Percentage of Teachers in Schools Receiving One-on-One Science-Focused Coaching

	AVERAGE PERCENT OF TEACHERS†
Elementary	28 (3.1)
Middle	41 (2.7)
High	37 (3.5)

† Includes only schools indicating in Q33 that teachers have access to one-on-one science-focused coaching.

Table SPQ 35.1
Providers of One-on-One Science-Focused Coaching in Elementary Schools

	PERCENT OF SCHOOLS†				
	NOT AT ALL		SOMEWHAT		TO A GREAT EXTENT
	1	2	3	4	5
The principal of your school	47 (5.2)	8 (3.1)	25 (4.1)	9 (3.3)	11 (3.3)
An assistant principal at your school	65 (5.0)	7 (3.1)	15 (3.6)	8 (3.5)	5 (2.4)
District/Diocese administrators including science supervisors/coordinators‡	31 (5.4)	8 (3.1)	22 (3.9)	21 (4.8)	18 (4.5)
Teachers/coaches who do not have classroom teaching responsibilities	31 (5.1)	5 (2.2)	24 (5.0)	16 (4.6)	24 (4.0)
Teachers/coaches who have part-time classroom teaching responsibilities	65 (5.4)	2 (1.7)	16 (4.2)	8 (3.0)	8 (2.8)
Teachers/coaches who have full-time classroom teaching responsibilities	42 (5.6)	5 (2.2)	17 (4.7)	21 (3.9)	15 (3.9)

† Includes only elementary schools indicating in Q33 that teachers have access to one-on-one science-focused coaching.
‡ This item was presented only to public and Catholic schools.

Table SPQ 35.2
Providers of One-on-One Science-Focused Coaching in Middle Schools

	PERCENT OF SCHOOLS†				
	NOT AT ALL		SOMEWHAT		TO A GREAT EXTENT
	1	2	3	4	5
The principal of your school	38 (5.5)	14 (3.7)	26 (5.4)	11 (3.2)	11 (4.6)
An assistant principal at your school	47 (6.0)	10 (3.7)	19 (3.9)	14 (4.2)	10 (4.1)
District/Diocese administrators including science supervisors/coordinators‡	40 (6.3)	2 (1.0)	20 (4.0)	15 (4.0)	23 (6.3)
Teachers/coaches who do not have classroom teaching responsibilities	35 (4.8)	3 (1.4)	16 (4.2)	14 (4.2)	32 (5.2)
Teachers/coaches who have part-time classroom teaching responsibilities	63 (5.8)	0 (0.5)	15 (3.8)	5 (1.6)	16 (4.9)
Teachers/coaches who have full-time classroom teaching responsibilities	25 (5.1)	6 (3.1)	20 (4.2)	24 (5.0)	25 (5.4)

† Includes only middle schools indicating in Q33 that teachers have access to one-on-one science-focused coaching.
‡ This item was presented only to public and Catholic schools.

Table SPQ 35.3
Providers of One-on-One Science-Focused Coaching in High Schools

	PERCENT OF SCHOOLS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
The principal of your school	43 (4.8)	12 (2.8)	22 (3.7)	12 (3.7)	10 (3.9)
An assistant principal at your school	47 (5.6)	9 (2.6)	23 (4.3)	12 (2.9)	8 (2.9)
District/Diocese administrators including science supervisors/coordinators‡	50 (5.8)	10 (2.6)	15 (3.2)	12 (2.9)	13 (3.3)
Teachers/coaches who do not have classroom teaching responsibilities	57 (5.6)	6 (2.2)	11 (3.2)	10 (2.5)	15 (3.8)
Teachers/coaches who have part-time classroom teaching responsibilities	70 (4.6)	2 (1.0)	12 (3.4)	4 (1.5)	11 (3.0)
Teachers/coaches who have full-time classroom teaching responsibilities	21 (4.5)	11 (3.2)	13 (3.0)	26 (4.4)	29 (4.3)

† Includes only high schools indicating in Q33 that teachers have access to one-on-one science-focused coaching.

‡ This item was presented only to public and Catholic schools.

Table SPQ 36
Services Provided to Teachers in Need of Special Assistance in Science Teaching, by Grade Range

	PERCENT OF SCHOOLS		
	ELEMENTARY	MIDDLE	HIGH
Seminars, classes, and/or study groups	30 (3.1)	28 (3.6)	25 (2.9)
Guidance from a formally designated mentor or coach	33 (2.5)	35 (2.9)	44 (3.4)
A higher level of supervision than for other teachers	15 (2.2)	22 (2.5)	33 (3.3)
None of the above	49 (3.0)	45 (3.8)	38 (3.6)

Mathematics Program Questionnaire
Mathematics Program Questionnaire Tables

2018 NSSME+
Mathematics Program Questionnaire

This questionnaire asks a number of questions about teachers of mathematics. In responding, unless otherwise specified, consider ALL teachers of mathematics in your school, including self-contained teachers who teach mathematics and other subjects to the same group of students all or most of the day.

1. Which of the following describe your position? [Select all that apply.]

☐	Mathematics department chair
☐	Mathematics lead teacher or coach
☐	Mathematics/STEM specialist
☐	Regular classroom teacher
☐	Principal
☐	Assistant principal
☐	Other (please specify: _______________)

School Programs and Practices

2. *[Presented only to schools that include self-contained teachers]*
Indicate whether each of the following programs and/or practices is currently being implemented in your school. [Select one on each row.]

		YES	NO
a.	Students in self-contained classes receive mathematics instruction from a district/diocese/school mathematics specialist **instead of** their regular teacher.	○	○
b.	Students in self-contained classes receive mathematics instruction from a district/diocese/school mathematics specialist **in addition** to their regular teacher.	○	○
c.	Students in self-contained classes pulled out for remedial instruction in mathematics	○	○
d.	Students in self-contained classes pulled out for enrichment in mathematics	○	○
e.	Students in self-contained classes pulled out from mathematics instruction for additional instruction in other content areas	○	○

3. *[Presented only to schools that include any grades 9–12]*
Indicate whether each of the following programs and/or practices is currently being implemented in your school. [Select one on each row.]

		YES	NO
a.	Algebra 1 course, or its equivalent, offered over two years or as two separate block courses (for example: Algebra A and Algebra B, or Integrated Math A and Integrated Math B).	○	○
b.	Calculus courses (beyond pre-Calculus) offered this school year or in alternating years, on or off site.	○	○
c.	Students can go to a Career and Technical Education (CTE) center for mathematics instruction.	○	○
d.	This school provides students access to virtual mathematics courses offered by other schools/institutions (for example: online, videoconference).	○	○
e.	This school provides its own mathematics courses virtually (for example: online, videoconference).	○	○
f.	Students can go to another K–12 school for mathematics courses.	○	○
g.	Students can go to a college or university for mathematics courses.	○	○

4. Indicate whether your school does each of the following to enhance students' interest and/or achievement in mathematics. [Select one on each row.]

		YES	NO
a.	Holds family math nights	○	○
b.	Offers after-school help in mathematics (for example: tutoring)	○	○
c.	Offers formal after-school programs for enrichment in mathematics	○	○
d.	Offers one or more mathematics clubs	○	○
e.	Participates in a local or regional mathematics fair	○	○
f.	Has one or more teams participating in mathematics competitions (for example: Math Counts)	○	○
g.	Encourages students to participate in mathematics summer programs or camps (for example: offered by community colleges, universities, museums or mathematics centers)	○	○
h.	Coordinates visits to business, industry, and/or research sites related to mathematics	○	○
i.	Coordinates meetings with adult mentors who work in mathematics fields	○	○
j.	Coordinates internships in mathematics fields	○	○

Your State Standards

5. Please provide your opinion about each of the following statements in regard to your current state standards for mathematics. [Select one on each row.]

	STRONGLY DISAGREE	DISAGREE	NO OPINION	AGREE	STRONGLY AGREE
a. State mathematics standards have been thoroughly discussed by mathematics teachers in this school.	①	②	③	④	⑤
b. There is a school-wide effort to align mathematics instruction with the state mathematics standards.	①	②	③	④	⑤
c. Most mathematics teachers in this school teach to the state standards.	①	②	③	④	⑤
d. The school/district/diocese organizes mathematics professional development based on state standards.	①	②	③	④	⑤

Student Enrollment in Mathematics Courses

6. ***[Presented only to schools that include grade 8]***
Approximately how many of this year's 8^{th} grade students will have completed Algebra 1 or its equivalent (for example: Integrated Math 1) prior to 9^{th} grade? [Enter your response as a whole number (for example: 15).] ______________________

7. ***[Presented only to schools that include grade 8]***
Approximately how many of this year's 8^{th} grade students will have completed Geometry or its equivalent (for example Integrated Math 2) prior to 9^{th} grade? [Enter your response as a whole number (for example: 15).] ______________________

8. ***[Presented only to schools that include any grades 9–12]***
Approximately how many students in grades 9–12 in this school will **not** take a mathematics course this year? [Enter your response as a whole number (for example: 1500)] ____________

Mathematics Courses Offered in Your School

[Questions 9–16 presented only to schools that include any grades 9–12; schools that do not include any of these grades skip to Q17]

9. What types of mathematics courses are offered to grades 9–12 students in your school **this year**? [Select all that apply.]

☐	Single-subject mathematics courses (for example: Algebra, Geometry)
☐	Integrated mathematics courses

10. Is your school offering any courses in each of the following categories **this year** for students in grades 9–12? [Select one on each row.]

	YES	NO
a. **Non-college prep mathematics courses** *Example courses*: Developmental Math; High School Arithmetic; Remedial Math; General Math; Vocational Math; Consumer Math; Basic Math; Business Math; Career Math; Practical Math; Essential Math; Pre-Algebra; Introductory Algebra; Algebra 1 Part 1; Algebra 1A; Math A; Basic Geometry; Informal Geometry; Practical Geometry	○	○
b. **Formal/College prep mathematics level 1 courses** *Example courses:* Algebra 1; Integrated Math 1; Unified Math I; Algebra 1 Part 2; Algebra 1B; Math B	○	○
c. **Formal/College prep mathematics level 2 courses** *Example courses:* Geometry; Plane Geometry; Solid Geometry; Integrated Math 2; Unified Math II; Math C	○	○
d. **Formal/College prep mathematics level 3 courses** *Example courses:* Algebra 2; Intermediate Algebra; Algebra and Trigonometry; Advanced Algebra; Integrated Math 3; Unified Math III	○	○
e. **Formal/College prep mathematics level 4 courses** *Example courses:* Algebra 3; Trigonometry; Pre-Calculus; Analytic/Advanced Geometry; Elementary Functions; Integrated Math 4, Unified Math IV; Calculus (not including college level/AP); any other College Prep Senior Math with Algebra 2 as a prerequisite	○	○
f. **Mathematics courses that might qualify for college credit** *Example courses:* Advanced Placement Calculus (AB, BC); Advanced Placement Statistics; IB Mathematics Standard Level; IB Mathematics Higher Level; concurrent college and high school credit/dual enrollment	○	○

11. Does this school offer one or more courses focused specifically on probability and/or statistics? (Include both courses that are offered every year and those offered in alternating years.)

○	Yes
○	No *[Skip to Q13]*

12. What probability and/or statistics courses does this school offer? [Select all that apply.]

☐	Probability and Statistics combined
☐	Probability
☐	Statistics

13. Does your school offer each of the following types of mathematics courses that might qualify for college credit? (Include both courses that are offered every year and those offered in alternating years.) [Select one on each row.]

	YES	NO
a. Advanced Placement (AP) mathematics courses	○	○
b. International Baccalaureate (IB) mathematics courses	○	○
c. Concurrent college and high school credit/dual enrollment mathematics courses	○	○

14. ***[Presented only to schools that selected "Yes" for Q13c]***
When are concurrent college and high school credit/dual enrollment mathematics courses offered?

○	Offered this school year
○	Not offered this school year, but offered in alternating years

15. Which of the following mathematics courses are available to students in this school, either on site, at other locations, or online? [Select one on each row.]

	AVAILABLE?		*[IF AVAILABLE]* WHERE OFFERED		*[IF AVAILABLE]* WHEN OFFERED	
	YES	NO	AT THIS SCHOOL	ELSEWHERE (OFFSITE OR ONLINE)	THIS YEAR	NOT THIS YEAR, BUT IN ALTERNATING YEARS
a. *[Skip if Q13a was "No"]* AP Calculus AB	○	○	○	○	○	○
b. *[Skip if Q13a was "No"]* AP Calculus BC	○	○	○	○	○	○
c. *[Skip if Q13a was "No"]* AP Statistics	○	○	○	○	○	○
d. *[Skip if Q13b was "No"]* IB Mathematical Studies Standard Level	○	○	○	○	○	○
e. *[Skip if Q13b was "No"]* IB Mathematics Standard Level	○	○	○	○	○	○
f. *[Skip if Q13b was "No"]* IB Mathematics Higher Level	○	○	○	○	○	○
g. *[Skip if Q13b was "No"]* IB Further Mathematics Standard Level	○	○	○	○	○	○

Mathematics Requirements

16. ***[Presented only to schools that include grade 12]***
In order to graduate from this high school, how many years of grades 9–12 mathematics are students required to take?

1 YEAR	2 YEARS	3 YEARS	4 YEARS
○	○	○	○

Influences on Mathematics Instruction

17. For this school, how much money was spent on each of the following during the most recently completed budget year? (If you don't know the exact amounts, please provide your best estimates.) [Enter each response as a whole dollar amount without special characters such as dollar signs (for example: 1500).]

a.	Consumable supplies for mathematics instruction (for example: graph paper)	
b.	Non-consumable items for mathematics instruction such as calculators, protractors, manipulatives, etc. (Do not include computers)	
c.	Software specific to mathematics instruction (for example: dynamic geometry software)	

18. Which of the following best describes how the mathematics instructional materials used in your school are selected? [Select one.]

○	At the district/diocese level (for example: by a mathematics supervisor or district/diocese -wide committee) ***[Not presented to non-Catholic private schools]***
○	At the school level (for example: by the principal, department chair, or teacher committee/grade-level team)
○	By individual teachers

19. Please rate the effect of each of the following on the quality of mathematics instruction in your school. [Select one on each row.]

	INHIBITS EFFECTIVE INSTRUCTION		NEUTRAL OR MIXED		PROMOTES EFFECTIVE INSTRUCTION
a. The school/district/diocese mathematics professional development policies and practices	①	②	③	④	⑤
b. The amount of time provided by the school/district/diocese for teacher professional development in mathematics	①	②	③	④	⑤
c. The importance that the school places on mathematics	①	②	③	④	⑤
d. Other school and/or district/diocese initiatives	①	②	③	④	⑤
e. The amount of time provided by the school/district/diocese for teachers to share ideas about mathematics instruction	①	②	③	④	⑤
f. How mathematics instructional resources are managed (for example: distributing and replacing materials)	①	②	③	④	⑤

20. In your opinion, how great a problem is each of the following for mathematics instruction **in your school as a whole**? [Select one on each row.]

		NOT A SIGNIFICANT PROBLEM	SOMEWHAT OF A PROBLEM	SERIOUS PROBLEM
a.	Lack of equipment and supplies and/or manipulatives for teaching mathematics (for example: materials for students to draw, cut and build in order to make sense of problems)	①	②	③
b.	Inadequate funds for purchasing mathematics equipment and supplies	①	②	③
c.	Lack of mathematics textbooks	①	②	③
d.	Poor quality mathematics textbooks	①	②	③
e.	Inadequate materials for differentiating mathematics instruction	①	②	③
f.	Low student interest in mathematics	①	②	③
g.	Low student prior knowledge and skills	①	②	③
h.	Lack of teacher interest in mathematics	①	②	③
i.	Inadequate teacher preparation to teach mathematics	①	②	③
j.	High teacher turnover	①	②	③
k.	Insufficient instructional time to teach mathematics	①	②	③
l.	Inadequate mathematics-related professional development opportunities	①	②	③
m.	Large class sizes	①	②	③
n.	High student absenteeism	①	②	③
o.	Inappropriate student behavior	①	②	③
p.	Lack of parent/guardian support and involvement	①	②	③
q.	Community attitudes toward mathematics instruction	①	②	③

Mathematics Professional Development Opportunities

21. **In the last 3 years,** has your school and/or district/diocese offered **workshops** specifically focused on mathematics or mathematics teaching, possibly in conjunction with other organizations (for example: other schools/districts/dioceses, colleges or universities, museums, professional associations, commercial vendors)?

○	Yes
○	No *[Skip to Q23]*

22. Please indicate the extent to which **workshops** offered by your school and/or district/diocese **in the last 3 years** emphasized each of the following: [Select one on each row.]

	NOT AT ALL		SOMEWHAT		TO A GREAT EXTENT
a. Deepening teachers' understanding of mathematics concepts	①	②	③	④	⑤
b. Deepening teachers' understanding of how mathematics is done (for example: considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models)	①	②	③	④	⑤
c. Deepening teachers' understanding of the state mathematics standards	①	②	③	④	⑤
d. Deepening teachers' understanding of how students think about various mathematical ideas	①	②	③	④	⑤
e. How to use particular mathematics instructional materials (for example: textbooks)	①	②	③	④	⑤
f. How to monitor student understanding during mathematics instruction	①	②	③	④	⑤
g. How to adapt mathematics instruction to address student misconceptions	①	②	③	④	⑤
h. How to use technology in mathematics instruction	①	②	③	④	⑤
i. How to use investigation-oriented tasks in mathematics instruction	①	②	③	④	⑤
j. How to develop students' confidence that they can successfully pursue careers in mathematics	①	②	③	④	⑤
k. How to incorporate real-world issues (for example: current events, community concerns) into mathematics instruction	①	②	③	④	⑤
l. How to connect instruction to mathematics career opportunities	①	②	③	④	⑤
m. How to integrate science, engineering, mathematics, and/or computer science	①	②	③	④	⑤
n. How to engage students in doing mathematics (for example: considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models)	①	②	③	④	⑤
o. How to incorporate students' cultural backgrounds into mathematics instruction	①	②	③	④	⑤
p. How to differentiate mathematics instruction to meet the needs of diverse learners	①	②	③	④	⑤

23. **In the last 3 years,** has your school offered **teacher study groups** where teachers meet on a regular basis to discuss teaching and learning of mathematics, and possibly other content areas as well (sometimes referred to as Professional Learning Communities, PLCs, or lesson study)?

○	Yes
○	No *[Skip to Q35]*

24. ***[Presented only to schools that include any grades K–5]***
Typically, are teachers of grades K–5 mathematics required to participate in these mathematics-focused **teacher study groups**?

○	Yes, all teachers of grades K–5 mathematics
○	Yes, but only mathematics/STEM specialists
○	No

25. ***[Presented only to schools that include any grades 6–8]***
Typically, are teachers of grades 6–8 mathematics classes required to participate in these mathematics-focused **teacher study groups**?

○	Yes
○	No

26. ***[Presented only to schools that include any grades 9–12]***
Typically, are teachers of grades 9–12 mathematics classes required to participate in these mathematics-focused **teacher study groups**?

○	Yes
○	No

27. Has your school specified a schedule for when these mathematics-focused **teacher study groups** are expected to meet?

○	Yes
○	No *[Skip to Q30]*

28. Over what period of time have these mathematics-focused **teacher study groups** typically been expected to meet?

○	The entire school year
○	One semester
○	Less than one semester

29. How often have these mathematics-focused **teacher study groups** typically been expected to meet?

○	Less than once a month
○	Once a month
○	Twice a month
○	More than twice a month

30. Which of the following describe the typical mathematics-focused **teacher study groups** in this school? [Select all that apply.]

☐	Organized by grade level
☐	Include teachers from multiple grade levels
☐	Include teachers who teach different mathematics subjects
☐	Include parents/guardians or other community members
☐	Include higher education faculty or other "consultants"
☐	Include school and/or district/diocese administrators
☐	Limited to teachers from this school
☐	Include teachers from other schools in the district/diocese ***[Not presented to non-Catholic private schools]***
☐	Include teachers from other schools outside of your district/diocese

31. Which of the following describe the typical mathematics-focused **teacher study groups** in this school? [Select all that apply.]

☐	Teachers engage in mathematics investigations.
☐	Teachers analyze student mathematics assessment results.
☐	Teachers analyze mathematics instructional materials (for example: textbooks).
☐	Teachers plan mathematics lessons together.
☐	Teachers rehearse instructional practices (meaning: try out, receive feedback, and reflect on those practices).
☐	Teachers observe each other's mathematics instruction (either in-person or through video recording).
☐	Teachers provide feedback on each other's mathematics instruction.
☐	Teachers examine classroom artifacts (for example: student work samples, videos of classroom instruction).

32. To what extent have these mathematics-focused **teacher study groups** emphasized each of the following? [Select one on each row.]

	NOT AT ALL		SOMEWHAT		TO A GREAT EXTENT
a. Deepening teachers' understanding of mathematics concepts	①	②	③	④	⑤
b. Deepening teachers' understanding of how mathematics is done (for example: considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models)	①	②	③	④	⑤
c. Deepening teachers' understanding of the state mathematics standards	①	②	③	④	⑤
d. Deepening teachers' understanding of how students think about various mathematical ideas	①	②	③	④	⑤
e. How to use particular mathematics instructional materials (for example: textbooks)	①	②	③	④	⑤
f. How to monitor student understanding during mathematics instruction	①	②	③	④	⑤
g. How to adapt mathematics instruction to address student misconceptions	①	②	③	④	⑤
h. How to use technology in mathematics instruction	①	②	③	④	⑤
i. How to use investigation-oriented tasks in mathematics instruction	①	②	③	④	⑤
j. How to develop students' confidence that they can successfully pursue careers in mathematics	①	②	③	④	⑤
k. How to incorporate real-world issues (for example: current events, community concerns) into mathematics instruction	①	②	③	④	⑤
l. How to connect instruction to mathematics career opportunities	①	②	③	④	⑤
m. How to integrate science, engineering, mathematics, and/or computer science	①	②	③	④	⑤
n. How to engage students in doing mathematics (for example: considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models)	①	②	③	④	⑤
o. How to incorporate students' cultural backgrounds into mathematics instruction	①	②	③	④	⑤
p. How to differentiate mathematics instruction to meet the needs of diverse learners	①	②	③	④	⑤

33. Have there been designated leaders for these mathematics-focused **teacher study groups**?

○	Yes
○	No *[Skip to Q35]*

34. The designated leaders of these mathematics-focused **teacher study groups** were from: [Select all that apply.]

□	This school
□	Elsewhere in this district/diocese *[Not presented to non-Catholic private schools]*
□	College/University
□	External consultants
□	Other (please specify: ________________)

35. Thinking about last school year, which of the following were used to provide teachers in this school with time for professional development workshops/teacher study groups that included a focus on mathematics and/or mathematics teaching, regardless of whether they were offered by your school and/or district/diocese? [Select all that apply.]

☐	Early dismissal and/or late start for students
☐	Professional days/teacher work days during the students' school year
☐	Professional days/teacher work days before and/or after the students' school year
☐	Common planning time for teachers
☐	Substitute teachers to cover teachers' classes while they attend professional development
☐	None of the above

36. Do any teachers in your school have access to **one-on-one coaching** focused on improving their mathematics instruction (include voluntary and required coaching)?

○	Yes
○	No *[Skip to Q39]*

37. This school year, how many teachers in this school have received one-on-one coaching focused on improving their mathematics instruction (include voluntary and required coaching)? [Enter response as a whole number (for example: 15)] _____________

38. To what extent is one-on-one coaching focused on improving mathematics instruction provided by each of the following? [Select one on each row.]

	NOT AT ALL		SOMEWHAT		TO A GREAT EXTENT
a. The principal of your school	①	②	③	④	⑤
b. An assistant principal at your school	①	②	③	④	⑤
c. District/Diocese administrators including mathematics supervisors/ coordinators *[Not presented to non-Catholic private schools]*	①	②	③	④	⑤
d. Teachers/coaches who do not have classroom teaching responsibilities	①	②	③	④	⑤
e. Teachers/coaches who have part-time classroom teaching responsibilities	①	②	③	④	⑤
f. Teachers/coaches who have full-time classroom teaching responsibilities	①	②	③	④	⑤

39. Which of the following are provided to teachers considered in need of special assistance in mathematics teaching? [Select all that apply.]

☐	Seminars, classes, and/or study groups
☐	Guidance from a formally designated mentor or coach
☐	A higher level of supervision than for other teachers
☐	None of the above

Thank you!

Mathematics Program Questionnaire Tables

Table MPQ 1
Titles of Mathematics Program Questionnaire Representatives, by Grade Range

	PERCENT OF REPRESENTATIVES		
	ELEMENTARY	MIDDLE	HIGH
Mathematics department chair	9 (1.5)	27 (2.4)	53 (3.4)
Mathematics lead teacher	23 (2.7)	27 (2.8)	23 (2.8)
Mathematics/STEM specialist	6 (1.7)	4 (1.2)	5 (1.6)
Regular classroom teacher	53 (3.3)	61 (3.6)	67 (2.8)
Principal	15 (2.2)	12 (2.5)	7 (1.9)
Assistant principal	4 (1.5)	5 (2.1)	1 (0.5)
Other	14 (1.8)	11 (1.9)	11 (2.3)

Table MPQ 2
Use of Various Instructional Arrangements in Elementary Schools

	PERCENT OF SCHOOLS†
Students in self-contained classes receive mathematics instruction from a district/diocese/school mathematics specialist *instead of* their regular teacher.	8 (1.7)
Students in self-contained classes receive mathematics instruction from a district/diocese/school mathematics specialist *in addition* to their regular teacher.	23 (2.4)
Students in self-contained classes pulled out for remedial instruction in mathematics	62 (3.0)
Students in self-contained classes pulled out for enrichment in mathematics	36 (2.8)
Students in self-contained classes pulled out from mathematics instruction for additional instruction in other content areas	25 (2.5)

† Includes only elementary schools that contain self-contained teachers.

Table MPQ 3
Mathematics Programs and Practices Currently Being Implemented in High Schools

	PERCENT OF SCHOOLS
Algebra 1 course, or its equivalent, offered over two years or as two separate block courses (e.g., Algebra A and Algebra B, or Integrated Math A and Integrated Math B).	44 (3.0)
Calculus courses (beyond pre-Calculus) offered this school year or in alternating years, on or off site.	76 (3.8)
Students can go to a Career and Technical Education (CTE) Center for mathematics instruction.	23 (2.3)
This school provides students access to virtual mathematics courses offered by other schools/institutions (e.g., online, videoconference).	59 (3.2)
This school provides its own mathematics courses virtually (e.g., online, videoconference).	15 (2.5)
Students can go to another K–12 school for mathematics courses.	11 (1.7)
Students can go to a college or university for mathematics courses.	68 (3.1)

Table MPQ 4
School Programs and Practices to Enhance Students' Interest and/or Achievement in Mathematics, by Grade Range

	PERCENT OF SCHOOLS		
	ELEMENTARY	MIDDLE	HIGH
Holds family math nights	38 (2.8)	21 (2.6)	6 (1.2)
Offers after-school help in mathematics (e.g., tutoring)	67 (2.7)	79 (2.9)	85 (2.9)
Offers formal after-school programs for enrichment in mathematics	27 (2.8)	35 (3.1)	18 (1.8)
Offers one or more mathematics clubs	20 (2.3)	29 (2.9)	36 (2.6)
Participates in a local or regional mathematics fair	16 (2.4)	19 (2.6)	19 (1.9)
Has one or more teams participating in mathematics competitions (e.g., Math Counts)	27 (2.5)	37 (3.1)	43 (3.0)
Encourages students to participate in mathematics summer programs or camps (e.g., offered by community colleges, universities, museums or mathematics centers)	47 (2.9)	49 (2.9)	51 (3.1)
Coordinates visits to business, industry, and/or research sites related to mathematics	17 (2.2)	14 (2.4)	19 (2.4)
Coordinates meetings with adult mentors who work in mathematics fields	14 (2.0)	15 (2.2)	13 (2.0)
Coordinates internships in mathematics fields	n/a	n/a	6 (1.2)

Table MPQ 5.1
Opinions About Various Statements Regarding State Mathematics Standards in Elementary Schools

	PERCENT OF SCHOOLS				
	STRONGLY DISAGREE	DISAGREE	NO OPINION	AGREE	STRONGLY AGREE
State mathematics standards have been thoroughly discussed by mathematics teachers in this school.	2 (0.6)	8 (1.9)	4 (1.5)	35 (2.7)	52 (2.7)
There is a school-wide effort to align mathematics instruction with the state mathematics standards.	3 (1.1)	5 (1.3)	2 (0.7)	31 (2.8)	59 (3.1)
Most mathematics teachers in this school teach to the state standards.	2 (1.0)	2 (1.0)	2 (0.7)	38 (3.2)	55 (3.0)
The school/district/diocese organizes mathematics professional development based on state standards.	4 (1.1)	14 (2.1)	9 (1.8)	32 (2.5)	42 (2.6)

Table MPQ 5.2
Opinions About Various Statements Regarding State Mathematics Standards in Middle Schools

	PERCENT OF SCHOOLS				
	STRONGLY DISAGREE	DISAGREE	NO OPINION	AGREE	STRONGLY AGREE
State mathematics standards have been thoroughly discussed by mathematics teachers in this school.	1 (0.5)	6 (2.0)	5 (2.0)	33 (2.9)	55 (3.1)
There is a school-wide effort to align mathematics instruction with the state mathematics standards.	2 (1.3)	4 (1.4)	3 (1.0)	30 (2.9)	61 (3.5)
Most mathematics teachers in this school teach to the state standards.	2 (1.4)	2 (0.8)	2 (0.8)	40 (3.7)	53 (3.4)
The school/district/diocese organizes mathematics professional development based on state standards.	6 (1.7)	15 (2.5)	12 (2.6)	33 (3.3)	34 (3.1)

Table MPQ 5.3
Opinions About Various Statements Regarding State Mathematics Standards in High Schools

	PERCENT OF SCHOOLS				
	STRONGLY DISAGREE	DISAGREE	NO OPINION	AGREE	STRONGLY AGREE
State mathematics standards have been thoroughly discussed by mathematics teachers in this school.	4 (1.5)	7 (1.6)	6 (1.9)	36 (2.9)	47 (3.0)
There is a school-wide effort to align mathematics instruction with the state mathematics standards.	4 (1.3)	4 (0.9)	5 (1.6)	36 (2.7)	50 (2.9)
Most mathematics teachers in this school teach to the state standards.	4 (1.5)	5 (1.4)	5 (1.5)	41 (3.3)	46 (3.3)
The school/district /diocese organizes mathematics professional development based on state standards.	9 (2.1)	19 (2.7)	19 (3.2)	30 (2.9)	22 (2.1)

Table MPQ 6 and 7
Average Percentage of 8th Grade Students Completing Algebra 1 or Geometry Prior to 9th Grade

	AVERAGE PERCENT OF STUDENTS
8th grade students that will have completed Algebra 1 prior to 9th grade	33 (2.6)
8th grade students that will have completed Geometry prior to 9th grade	8 (2.3)

Table MPQ 8
Average Percentage of High School Students Not Taking a Mathematics Course During the School Year

	AVERAGE PERCENT OF STUDENTS
Students not taking a mathematics course during the school year	6 (0.6)

Table MPQ 9
Type of High School Mathematics Courses Offered

	PERCENT OF SCHOOLS
Single-subject mathematics courses (e.g., Algebra, Geometry)	98 (0.7)
Integrated mathematics courses	20 (2.2)

Table MPQ 10
High School Mathematics Courses Offered

	PERCENT OF SCHOOLS
Non-college prep mathematics courses	79 (2.8)
Formal/College prep mathematics level 1 courses	98 (1.0)
Formal/College prep mathematics level 2 courses	93 (1.9)
Formal/College prep mathematics level 3 courses	91 (2.2)
Formal/College prep mathematics level 4 courses	90 (2.5)
Mathematics courses that might qualify for college credit	72 (3.5)

Table MPQ 11 and 12
High Schools Offering Various Probability and Statistics Courses

	PERCENT OF SCHOOLS†
Any Probability and/or Statistics	52 (3.2)
Probability and Statistics combined	28 (2.5)
Probability	2 (0.7)
Statistics	28 (2.8)

† Schools indicating in Q12 that they do not offer probability and/or statistics classes are treated as not offering each of the specific courses.

Table MPQ 13
High Schools Offering Mathematics Courses That Might Qualify for College Credit

	PERCENT OF SCHOOLS
Advanced Placement (AP) mathematics courses	54 (3.3)
International Baccalaureate (IB) mathematics courses	4 (0.8)
Concurrent college and high school credit/dual enrollment mathematics courses	67 (3.0)

Table MPQ 14
When High Schools Offer Concurrent College and High School Credit/Dual Enrollment Mathematics Courses

	PERCENT OF SCHOOLS†
Offered this school year	100 (0.0)
Not offered this school year, but offered in alternating years	0 ---‡

† Includes only schools indicating in Q13 that they offer concurrent college and high school credit/dual enrollment mathematics courses.
‡ No high schools in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table MPQ 15
Where and When High Schools Offer Various Advanced Placement and International Baccalaureate Mathematics Courses

	PERCENT OF SCHOOLS					
	AVAILABLE?		WHERE OFFERED†		WHEN OFFERED†	
	Yes	No	At this school	Elsewhere (offsite or online)	This year	Not this year, but in alternating years
AP Calculus AB	53 (3.2)	47 (3.2)	93 (2.0)	7 (2.0)	95 (2.4)	5 (2.4)
AP Calculus BC	30 (2.4)	70 (2.4)	79 (3.8)	21 (3.8)	93 (2.6)	7 (2.6)
AP Statistics	34 (2.8)	66 (2.8)	95 (2.4)	5 (2.4)	87 (3.7)	13 (3.7)
IB Mathematical Studies Standard Level	3 (0.7)	97 (0.7)	87 (6.8)	13 (6.8)	97 (2.6)	3 (2.6)
IB Mathematics Standard Level	3 (0.6)	97 (0.6)	89 (6.9)	11 (6.9)	94 (6.5)	6 (6.5)
IB Mathematics Higher Level	3 (0.6)	97 (0.6)	91 (5.4)	9 (5.4)	100 (0.0)	0 ---‡
IB Further Mathematics Standard Level	1 (0.2)	99 (0.2)	71 (18.0)	29 (18.0)	92 (7.5)	8 (7.5)

† Includes only schools indicating AP and/or IB course availability.

‡ No high schools in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table MPQ 16
High School Mathematics Graduation Requirements

	PERCENT OF SCHOOLS†
1 year	0 (0.5)
2 years	4 (1.2)
3 years	44 (3.1)
4 years	52 (3.2)

† Includes only schools that contain grade 12.

Table MPQ 17
Median Amount Schools Spent Per Pupil on Consumable Supplies, Non-Consumable Items, and Software for Mathematics, by Grade Range

	MEDIAN AMOUNT		
	ELEMENTARY	MIDDLE	HIGH
Consumable supplies for mathematics instruction (e.g., graph paper)	$1.46 (0.2)	$0.97 (0.2)	$0.56 (0.1)
Non-consumable items for mathematics instruction such as calculators, protractors, manipulatives, etc.	$0.92 (0.2)	$0.80 (0.1)	$0.93 (0.2)
Software specific to mathematics instruction (e.g., dynamic geometry software)	$0.05 (0.4)†	$0.00 ---‡	$0.09 (0.2)†

† Standard errors for medians are typically computed in Wesvar 5.1 using the Woodruff method. Wesvar was unable to compute a standard error for this estimate using this method; thus, the potentially less-consistent replication standard error is reported.

‡ It was not possible to compute a standard error using either the Woodruff or the replication methods.

Table MPQ 18
How Mathematics Instructional Materials Are Selected, by Grade Range

	PERCENT OF SCHOOLS		
	ELEMENTARY	MIDDLE	HIGH
At the district/diocese level (e.g., by a mathematics supervisor or district/diocese-wide committee)†	47 (2.4)	35 (3.6)	13 (1.7)
At the school level (e.g., by the principal, department chair, or teacher committee/grade-level team)	30 (2.8)	36 (3.1)	40 (3.4)
By individual teachers	22 (2.4)	29 (2.7)	47 (3.6)

† This item was presented only to public and Catholic schools.

Table MPQ 19.1
Effect of Various Factors on Mathematics Instruction in Elementary Schools

	PERCENT OF SCHOOLS				
	INHIBITS EFFECTIVE INSTRUCTION		NEUTRAL OR MIXED		PROMOTES EFFECTIVE INSTRUCTION
	1	2	3	4	5
The school/district/diocese mathematics professional development policies and practices	2 (0.9)	4 (1.2)	28 (2.7)	30 (2.7)	37 (3.4)
The amount of time provided by the school/district/diocese for teacher professional development in mathematics	5 (1.0)	11 (1.8)	30 (2.8)	29 (3.0)	25 (2.8)
The importance that the school places on mathematics	3 (0.9)	4 (1.1)	13 (2.2)	38 (3.1)	42 (3.4)
Other school and/or district and/or diocese initiatives	3 (0.9)	6 (1.4)	41 (2.9)	30 (2.6)	19 (2.4)
The amount of time provided by the school/district/diocese for teachers to share ideas about mathematics instruction	6 (1.5)	13 (1.7)	28 (2.8)	31 (2.7)	21 (2.7)
How mathematics instructional resources are managed (e.g., distributing and replacing materials)	5 (1.3)	8 (1.6)	27 (2.6)	33 (2.9)	28 (2.9)

Table MPQ 19.2
Effect of Various Factors on Mathematics Instruction in Middle Schools

	PERCENT OF SCHOOLS				
	INHIBITS EFFECTIVE INSTRUCTION 1	2	NEUTRAL OR MIXED 3	4	PROMOTES EFFECTIVE INSTRUCTION 5
The school/district/diocese mathematics professional development policies and practices	4 (1.2)	4 (1.2)	28 (3.0)	31 (2.9)	33 (3.1)
The amount of time provided by the school/district/diocese for teacher professional development in mathematics	6 (1.5)	15 (2.5)	29 (2.8)	30 (3.4)	20 (2.4)
The importance that the school places on mathematics	2 (1.0)	3 (0.8)	13 (2.1)	40 (3.3)	42 (3.3)
Other school and/or district and/or diocese initiatives	4 (1.2)	5 (1.2)	51 (3.6)	26 (3.4)	15 (2.4)
The amount of time provided by the school/district/diocese for teachers to share ideas about mathematics instruction	8 (2.2)	14 (1.9)	30 (3.2)	35 (2.9)	14 (2.1)
How mathematics instructional resources are managed (e.g., distributing and replacing materials)	7 (1.9)	8 (1.9)	32 (2.7)	32 (2.6)	21 (2.6)

Table MPQ 19.3
Effect of Various Factors on Mathematics Instruction in High Schools

	PERCENT OF SCHOOLS				
	INHIBITS EFFECTIVE INSTRUCTION 1	2	NEUTRAL OR MIXED 3	4	PROMOTES EFFECTIVE INSTRUCTION 5
The school/district/diocese mathematics professional development policies and practices	4 (1.4)	5 (1.5)	36 (2.8)	29 (3.0)	26 (2.6)
The amount of time provided by the school/district/diocese for teacher professional development in mathematics	6 (1.7)	15 (2.6)	36 (3.4)	28 (2.3)	15 (2.2)
The importance that the school places on mathematics	3 (0.7)	6 (1.7)	19 (2.4)	41 (3.3)	32 (2.8)
Other school and/or district and/or diocese initiatives	3 (0.9)	6 (1.2)	58 (2.8)	25 (2.4)	8 (1.4)
The amount of time provided by the school/district/diocese for teachers to share ideas about mathematics instruction	5 (1.7)	18 (2.5)	29 (3.0)	35 (3.1)	13 (1.8)
How mathematics instructional resources are managed (e.g., distributing and replacing materials)	4 (1.4)	9 (2.1)	31 (3.3)	39 (2.7)	18 (2.0)

Table MPQ 20.1
Mathematics Program Representatives' Opinions About the Extent to Which Various Factors Are Problematic for Mathematics Instruction in Elementary Schools

	PERCENT OF SCHOOLS		
	NOT A SIGNIFICANT PROBLEM	SOMEWHAT OF A PROBLEM	SERIOUS PROBLEM
Lack of equipment and supplies and/or manipulatives for teaching mathematics (e.g., materials for students to draw, cut, and build in order to make sense of problems)	74 (3.0)	23 (2.9)	3 (0.9)
Inadequate funds for purchasing mathematics equipment and supplies	65 (2.4)	28 (2.4)	7 (1.5)
Lack of mathematics textbooks	83 (2.3)	11 (2.1)	6 (1.1)
Poor quality mathematics textbooks	73 (2.5)	19 (2.4)	8 (1.4)
Inadequate materials for differentiating mathematics instruction	46 (3.0)	45 (2.9)	9 (1.5)
Low student interest in mathematics	44 (3.5)	45 (3.4)	11 (1.9)
Low student prior knowledge and skills	29 (2.8)	48 (2.8)	22 (2.4)
Lack of teacher interest in mathematics	75 (2.8)	23 (2.7)	2 (1.0)
Inadequate teacher preparation to teach mathematics	61 (3.2)	34 (3.0)	6 (1.4)
High teacher turnover	71 (2.8)	22 (2.2)	7 (1.6)
Insufficient instructional time to teach mathematics	64 (3.0)	31 (2.9)	4 (1.0)
Inadequate mathematics-related professional development opportunities	48 (3.0)	43 (2.9)	9 (1.6)
Large class sizes	65 (3.3)	24 (2.7)	12 (2.0)
High student absenteeism	56 (2.9)	36 (2.7)	8 (1.7)
Inappropriate student behavior	54 (2.8)	34 (2.7)	13 (1.9)
Lack of parent/guardian support and involvement	40 (3.0)	42 (3.1)	18 (2.2)
Community attitudes toward mathematics instruction	63 (3.0)	29 (3.0)	8 (1.6)

Table MPQ 20.2
Mathematics Program Representatives' Opinions About the Extent to Which Various Factors Are Problematic for Mathematics Instruction in Middle Schools

	PERCENT OF SCHOOLS		
	NOT A SIGNIFICANT PROBLEM	SOMEWHAT OF A PROBLEM	SERIOUS PROBLEM
Lack of equipment and supplies and/or manipulatives for teaching mathematics (e.g., materials for students to draw, cut, and build in order to make sense of problems)	66 (3.5)	32 (3.4)	2 (1.0)
Inadequate funds for purchasing mathematics equipment and supplies	57 (3.5)	36 (3.1)	7 (1.8)
Lack of mathematics textbooks	81 (2.7)	13 (2.4)	6 (1.3)
Poor quality mathematics textbooks	72 (2.7)	19 (2.1)	9 (2.0)
Inadequate materials for differentiating mathematics instruction	47 (3.0)	45 (3.1)	8 (1.7)
Low student interest in mathematics	33 (3.9)	46 (3.3)	21 (2.4)
Low student prior knowledge and skills	23 (3.0)	43 (2.9)	34 (2.6)
Lack of teacher interest in mathematics	81 (2.7)	17 (2.6)	2 (0.9)
Inadequate teacher preparation to teach mathematics	71 (3.2)	25 (2.8)	4 (1.4)
High teacher turnover	66 (3.1)	24 (2.9)	10 (1.8)
Insufficient instructional time to teach mathematics	64 (3.0)	30 (2.8)	6 (1.5)
Inadequate mathematics-related professional development opportunities	49 (3.5)	43 (3.0)	7 (1.7)
Large class sizes	62 (2.9)	26 (2.5)	12 (1.7)
High student absenteeism	49 (3.4)	38 (3.1)	13 (1.8)
Inappropriate student behavior	49 (3.1)	36 (3.1)	15 (1.9)
Lack of parent/guardian support and involvement	37 (3.7)	43 (3.7)	20 (2.3)
Community attitudes toward mathematics instruction	57 (3.4)	33 (3.4)	9 (1.7)

Table MPQ 20.3
Mathematics Program Representatives' Opinions About the Extent to Which Various Factors Are Problematic for Mathematics Instruction in High Schools

	PERCENT OF SCHOOLS		
	NOT A SIGNIFICANT PROBLEM	SOMEWHAT OF A PROBLEM	SERIOUS PROBLEM
Lack of equipment and supplies and/or manipulatives for teaching mathematics (e.g., materials for students to draw, cut, and build in order to make sense of problems)	61 (3.5)	36 (3.7)	3 (1.1)
Inadequate funds for purchasing mathematics equipment and supplies	55 (3.2)	38 (3.6)	7 (1.5)
Lack of mathematics textbooks	71 (3.0)	20 (2.6)	9 (1.7)
Poor quality mathematics textbooks	60 (3.2)	25 (2.7)	14 (2.5)
Inadequate materials for differentiating mathematics instruction	50 (2.8)	42 (3.1)	8 (1.6)
Low student interest in mathematics	18 (2.2)	54 (3.2)	29 (2.9)
Low student prior knowledge and skills	13 (1.5)	49 (2.9)	37 (3.0)
Lack of teacher interest in mathematics	85 (2.4)	13 (2.2)	2 (0.8)
Inadequate teacher preparation to teach mathematics	81 (2.6)	16 (2.4)	3 (1.0)
High teacher turnover	62 (3.1)	28 (3.3)	10 (1.9)
Insufficient instructional time to teach mathematics	56 (3.3)	35 (3.3)	9 (1.7)
Inadequate mathematics-related professional development opportunities	47 (3.1)	43 (3.2)	10 (2.0)
Large class sizes	59 (3.2)	31 (3.0)	10 (1.5)
High student absenteeism	41 (3.0)	37 (3.3)	21 (2.5)
Inappropriate student behavior	54 (2.9)	34 (3.1)	13 (2.2)
Lack of parent/guardian support and involvement	33 (2.8)	46 (3.0)	20 (2.6)
Community attitudes toward mathematics instruction	51 (3.3)	37 (3.1)	11 (2.0)

Table MPQ 21
Mathematics-Focused Professional Development Workshops Offered by School/District in the Last Three Years

	PERCENT OF SCHOOLS
Elementary	69 (2.7)
Middle	61 (3.3)
High	46 (3.1)

Table MPQ 22.1
Elementary Schools With Locally Offered Mathematics Professional Development Workshops in the Last Three Years With an Emphasis in Each of a Number of Areas

	PERCENT OF SCHOOLS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
Deepening teachers' understanding of mathematics concepts	4 (1.8)	2 (1.0)	29 (3.1)	36 (3.5)	29 (3.1)
Deepening teachers' understanding of how mathematics is done (e.g., considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models)	5 (2.0)	3 (1.2)	26 (3.2)	38 (3.6)	29 (3.3)
Deepening teachers' understanding of the state mathematics standards	3 (1.6)	5 (1.9)	24 (3.4)	34 (3.6)	33 (3.2)
Deepening teachers' understanding of how students think about various mathematical ideas	2 (1.4)	7 (2.1)	30 (3.8)	37 (3.5)	24 (3.1)
How to use particular mathematics instructional materials (e.g., textbooks)	4 (1.6)	12 (2.2)	31 (3.3)	29 (3.2)	24 (3.1)
How to monitor student understanding during mathematics instruction	4 (1.7)	11 (2.2)	32 (3.5)	33 (3.7)	20 (2.9)
How to adapt mathematics instruction to address student misconceptions	5 (1.8)	13 (2.1)	38 (3.4)	27 (2.9)	18 (2.7)
How to use technology in mathematics instruction	8 (2.0)	13 (2.3)	30 (3.2)	32 (3.3)	17 (2.7)
How to use investigation-oriented tasks in mathematics instruction	6 (1.8)	19 (3.2)	31 (3.5)	26 (3.1)	17 (2.5)
How to develop students' confidence that they can successfully pursue careers in mathematics	23 (3.3)	21 (3.0)	29 (3.5)	19 (3.0)	7 (1.7)
How to incorporate real-world issues (e.g., current events, community concerns) into mathematics instruction	13 (2.6)	17 (2.6)	36 (3.3)	23 (2.8)	12 (2.3)
How to connect instruction to mathematics career opportunities	21 (3.1)	30 (3.4)	27 (3.1)	15 (2.7)	6 (1.8)
How to integrate science, engineering, mathematics, and/or computer science	14 (2.7)	23 (3.2)	31 (3.6)	24 (3.3)	9 (2.1)
How to engage students in doing mathematics (e.g., considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models)	2 (1.4)	10 (2.0)	33 (3.3)	33 (3.4)	22 (3.4)
How to incorporate students' cultural backgrounds into mathematics instruction	32 (3.5)	27 (3.2)	27 (3.5)	10 (1.7)	4 (1.5)
How to differentiate mathematics instruction to meet the needs of diverse learners	4 (1.4)	12 (2.5)	38 (3.7)	30 (3.2)	16 (2.8)

† Includes only elementary schools indicating in Q21 that they and/or their district/diocese offered mathematics-focused workshops in the last three years.

Table MPQ 22.2
Middle Schools With Locally Offered Mathematics Professional Development Workshops in the Last Three Years With an Emphasis in Each of a Number of Areas

	PERCENT OF SCHOOLS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
Deepening teachers' understanding of mathematics concepts	5 (1.4)	3 (0.9)	33 (4.1)	32 (3.7)	27 (3.3)
Deepening teachers' understanding of how mathematics is done (e.g., considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models)	5 (1.6)	6 (1.6)	29 (4.2)	35 (4.3)	25 (3.1)
Deepening teachers' understanding of the state mathematics standards	4 (1.4)	9 (2.9)	23 (3.6)	29 (3.5)	35 (3.6)
Deepening teachers' understanding of how students think about various mathematical ideas	4 (1.5)	7 (1.9)	31 (4.0)	34 (4.1)	23 (3.6)
How to use particular mathematics instructional materials (e.g., textbooks)	8 (1.7)	11 (2.4)	24 (3.2)	31 (3.6)	27 (3.6)
How to monitor student understanding during mathematics instruction	4 (1.3)	14 (3.3)	29 (3.6)	31 (3.7)	21 (3.5)
How to adapt mathematics instruction to address student misconceptions	6 (1.5)	12 (2.6)	32 (3.7)	30 (4.0)	20 (3.3)
How to use technology in mathematics instruction	9 (2.3)	12 (2.9)	30 (3.5)	31 (3.9)	19 (3.4)
How to use investigation-oriented tasks in mathematics instruction	7 (1.7)	21 (3.5)	30 (3.6)	23 (3.7)	19 (2.9)
How to develop students' confidence that they can successfully pursue careers in mathematics	23 (3.2)	21 (3.2)	34 (4.1)	15 (2.9)	7 (2.2)
How to incorporate real-world issues (e.g., current events, community concerns) into mathematics instruction	15 (2.7)	16 (2.7)	37 (4.0)	19 (3.7)	13 (2.7)
How to connect instruction to mathematics career opportunities	21 (3.0)	28 (3.7)	30 (3.7)	13 (3.1)	8 (2.4)
How to integrate science, engineering, mathematics, and/or computer science	15 (2.7)	22 (3.5)	29 (3.9)	26 (4.2)	8 (2.3)
How to engage students in doing mathematics (e.g., considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models)	3 (0.9)	6 (1.4)	34 (3.7)	34 (3.7)	23 (3.7)
How to incorporate students' cultural backgrounds into mathematics instruction	33 (4.0)	32 (3.9)	26 (3.6)	5 (1.5)	4 (1.7)
How to differentiate mathematics instruction to meet the needs of diverse learners	7 (1.8)	11 (2.4)	37 (4.1)	30 (4.2)	16 (2.9)

† Includes only middle schools indicating in Q21 that they and/or their district/diocese offered mathematics-focused workshops in the last three years.

Table MPQ 22.3
High Schools With Locally Offered Mathematics Professional Development Workshops in the Last Three Years With an Emphasis in Each of a Number of Areas

	PERCENT OF SCHOOLS†									
	NOT AT ALL 1		2		SOMEWHAT 3		4		TO A GREAT EXTENT 5	
Deepening teachers' understanding of mathematics concepts	10	(2.5)	11	(3.0)	40	(5.1)	29	(4.4)	10	(2.2)
Deepening teachers' understanding of how mathematics is done (e.g., considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models)	6	(1.9)	12	(2.9)	39	(5.0)	31	(4.3)	13	(2.6)
Deepening teachers' understanding of the state mathematics standards	10	(2.7)	6	(1.5)	28	(4.7)	33	(3.7)	24	(3.9)
Deepening teachers' understanding of how students think about various mathematical ideas	7	(2.3)	19	(4.6)	37	(5.4)	26	(3.5)	11	(2.5)
How to use particular mathematics instructional materials (e.g., textbooks)	15	(3.0)	18	(3.0)	32	(4.3)	24	(3.9)	12	(2.4)
How to monitor student understanding during mathematics instruction	11	(2.3)	12	(2.7)	37	(4.4)	27	(4.1)	13	(3.0)
How to adapt mathematics instruction to address student misconceptions	9	(2.1)	18	(5.1)	40	(4.8)	24	(2.9)	8	(2.3)
How to use technology in mathematics instruction	7	(1.9)	10	(1.8)	29	(4.1)	35	(3.6)	18	(3.0)
How to use investigation-oriented tasks in mathematics instruction	8	(1.7)	19	(4.2)	42	(4.1)	19	(2.5)	12	(2.7)
How to develop students' confidence that they can successfully pursue careers in mathematics	30	(4.6)	19	(2.5)	29	(5.2)	18	(3.6)	4	(1.2)
How to incorporate real-world issues (e.g., current events, community concerns) into mathematics instruction	19	(3.2)	18	(2.9)	39	(4.8)	14	(2.5)	10	(3.1)
How to connect instruction to mathematics career opportunities	29	(3.9)	26	(3.6)	28	(4.4)	13	(3.0)	5	(1.6)
How to integrate science, engineering, mathematics, and/or computer science	21	(3.0)	25	(3.8)	28	(3.8)	22	(4.4)	4	(1.3)
How to engage students in doing mathematics (e.g., considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models)	5	(1.3)	13	(3.4)	41	(4.8)	28	(3.5)	13	(3.0)
How to incorporate students' cultural backgrounds into mathematics instruction	39	(4.3)	30	(4.4)	22	(3.1)	7	(1.8)	2	(0.8)
How to differentiate mathematics instruction to meet the needs of diverse learners	9	(2.5)	16	(3.6)	42	(5.2)	21	(3.0)	11	(2.9)

† Includes only high schools indicating in Q21 that they and/or their district/diocese offered mathematics-focused workshops in the last three years.

Table MPQ 23
Mathematics-Focused Teacher Study Groups Offered by School in the Last Three Years

	PERCENT OF SCHOOLS
Elementary	55 (3.2)
Middle	57 (3.3)
High	53 (2.8)

Table MPQ 24
Required Participation in Mathematics-Focused Teacher Study Groups in Elementary Schools

	PERCENT OF SCHOOLS†
All teachers of grades K–5 mathematics	76 (3.1)
Only mathematics/STEM specialists	6 (1.8)
No required participation	18 (3.0)

† Includes only elementary schools indicating in Q23 that they offered mathematics-focused teacher study groups in the last three years.

Table MPQ 25 and 26
Required Participation in Mathematics-Focused Teacher Study Groups in Secondary Schools

	PERCENT OF SCHOOLS†
Middle	83 (3.1)
High	77 (4.3)

† Includes only secondary schools indicating in Q23 that they offered mathematics-focused teacher study groups in the last three years.

Table MPQ 27
Schools With Specified Schedule for Mathematics-Focused Teacher Study Groups

	PERCENT OF SCHOOLS†
Elementary	77 (3.2)
Middle	74 (3.9)
High	82 (3.2)

† Includes only schools indicating in Q23 that they offered mathematics-focused teacher study groups in the last three years.

Table MPQ 28
Duration of Mathematics-Focused Teacher Study Groups, by Grade Range

	PERCENT OF SCHOOLS†		
	ELEMENTARY	MIDDLE	HIGH
The entire school year	89 (2.6)	95 (1.7)	93 (2.8)
One semester	8 (2.2)	3 (1.5)	4 (1.8)
Less than one semester	3 (1.8)	2 (0.9)	3 (1.4)

† Includes only schools indicating in Q23 that they offered mathematics-focused teacher study groups in the last three years and indicating in Q27 that they have a specified schedule for these teacher study groups.

Table MPQ 29

Frequency of Mathematics-Focused Teacher Study Groups, by Grade Range

	PERCENT OF SCHOOLS†		
	ELEMENTARY	MIDDLE	HIGH
Less than once a month	24 (3.9)	20 (4.6)	14 (2.8)
Once a month	29 (3.9)	26 (3.7)	35 (3.8)
Twice a month	18 (3.3)	16 (3.4)	21 (2.9)
More than twice a month	29 (4.1)	38 (4.0)	30 (3.6)

† Includes only schools indicating in Q23 that they offered mathematics-focused teacher study groups in the last three years and indicating in Q27 that they have a specified schedule for these teacher study groups.

Table MPQ 30

Composition of Mathematics-Focused Teacher Study Groups, by Grade Range

	PERCENT OF SCHOOLS†		
	ELEMENTARY	MIDDLE	HIGH
Organized by grade level	77 (3.1)	69 (3.5)	36 (3.4)
Include teachers from multiple grade levels	54 (3.2)	62 (3.8)	70 (4.4)
Include teachers who teach different mathematics subjects	24 (3.3)	47 (4.9)	72 (2.8)
Include parents/guardians or other community members	2 (0.9)	1 (1.1)	1 (0.5)
Include higher education faculty or other “consultants”	17 (3.0)	19 (3.1)	16 (4.0)
Include school and/or district/diocese administrators	61 (4.1)	56 (3.7)	38 (3.8)
Limited to teachers from this school	53 (4.3)	61 (4.7)	71 (4.5)
Include teachers from other schools in the district/diocese‡	27 (3.7)	23 (3.8)	14 (3.4)
Include teachers from other schools outside of your district/diocese	5 (1.9)	3 (2.0)	3 (1.8)

† Includes only schools indicating in Q23 that they offered mathematics-focused teacher study groups in the last three years.

‡ This item was presented only to public and Catholic schools.

Table MPQ 31
Description of Activities in
Mathematics-Focused Teacher Study Groups, by Grade Range

	PERCENT OF SCHOOLS†		
	ELEMENTARY	MIDDLE	HIGH
Teachers engage in mathematics investigations	34 (3.7)	37 (4.5)	36 (4.5)
Teachers analyze student mathematics assessment results	81 (3.6)	79 (4.1)	76 (4.2)
Teachers analyze mathematics instructional materials (e.g., textbooks)	59 (4.4)	63 (4.4)	64 (4.0)
Teachers plan mathematics lessons together	59 (3.4)	63 (4.1)	63 (3.5)
Teachers rehearse instructional practices (i.e., try out, receive feedback, and reflect on those practices)	29 (3.7)	26 (3.8)	21 (2.8)
Teachers observe each other's mathematics instruction (either in-person or through video recording)	26 (3.9)	25 (3.5)	21 (2.8)
Teachers provide feedback on each other's mathematics instruction	31 (4.0)	31 (4.2)	26 (3.7)
Teachers examine classroom artifacts (e.g., student work samples, videos of classroom instruction)	45 (3.8)	37 (3.9)	32 (3.8)

† Includes only schools indicating in Q23 that they offered mathematics-focused teacher study groups in the last three years.

Table MPQ 32.1
Elementary School Mathematics-Focused Teacher Study Groups in the Last Three Years With an Emphasis in Each of a Number of Areas

	PERCENT OF SCHOOLS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
Deeping teachers' understanding of mathematics concepts	9 (2.2)	8 (2.4)	29 (4.0)	35 (4.3)	20 (3.2)
Deepening teachers' understanding of the how mathematics is done (e.g., considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models)	5 (1.6)	11 (3.1)	25 (3.6)	33 (3.7)	25 (3.2)
Deepening teachers' understanding of the state mathematics standards	6 (1.7)	11 (3.1)	19 (3.2)	30 (4.3)	33 (4.0)
Deepening teachers' understanding of how students think about various mathematical ideas	5 (1.7)	9 (2.4)	28 (3.4)	37 (3.9)	21 (3.4)
How to use particular mathematics instructional materials (e.g., textbooks)	6 (2.0)	13 (2.8)	29 (3.8)	35 (3.9)	17 (2.6)
How to monitor student understanding during mathematics instruction	5 (1.6)	11 (2.9)	28 (3.3)	42 (3.6)	15 (2.9)
How to adapt mathematics instruction to address student misconceptions	7 (1.9)	11 (2.5)	30 (3.6)	35 (3.8)	16 (3.1)
How to use technology in mathematics instruction	10 (2.2)	17 (2.4)	36 (4.0)	26 (3.8)	11 (2.3)
How to use investigation-oriented tasks in mathematics instruction	8 (1.9)	23 (3.3)	33 (3.4)	22 (3.7)	14 (2.2)
How to develop students' confidence that they can successfully pursue careers in mathematics	31 (3.9)	18 (2.8)	28 (3.9)	14 (2.9)	9 (2.4)
How to incorporate real-world issues (e.g., current events, community concerns) into mathematics instruction	14 (2.8)	17 (2.6)	32 (3.7)	27 (3.5)	11 (2.2)
How to connect instruction to mathematics career opportunities	29 (3.9)	25 (3.0)	24 (3.4)	15 (3.1)	7 (1.9)
How to integrate science, engineering, mathematics, and/or computer science	18 (3.0)	20 (3.3)	34 (4.0)	16 (3.2)	12 (2.5)
How to engage students in doing mathematics (e.g., considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models)	3 (1.3)	8 (2.1)	23 (3.6)	40 (4.1)	26 (3.7)
How to incorporate students' cultural backgrounds into mathematics instruction	32 (4.3)	28 (3.6)	22 (3.9)	11 (2.6)	7 (2.1)
How to differentiate mathematics instruction to meet the needs of diverse learners	3 (1.1)	9 (1.9)	32 (3.6)	32 (4.1)	24 (3.6)

† Includes only elementary schools indicating in Q23 that they offered mathematics-focused teacher study groups in the last three years.

Table MPQ 32.2
Middle School Mathematics-Focused Teacher Study Groups in the Last Three Years With an Emphasis in Each of a Number of Areas

	PERCENT OF SCHOOLS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
Deeping teachers' understanding of mathematics concepts	9 (2.5)	14 (3.3)	37 (3.8)	21 (3.2)	19 (3.2)
Deepening teachers' understanding of the how mathematics is done (e.g., considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models)	6 (1.4)	14 (3.8)	29 (4.0)	28 (4.2)	23 (3.5)
Deepening teachers' understanding of the state mathematics standards	5 (1.4)	12 (3.4)	23 (3.0)	26 (3.7)	35 (4.1)
Deepening teachers' understanding of how students think about various mathematical ideas	6 (1.8)	10 (2.5)	34 (4.0)	28 (3.6)	22 (3.6)
How to use particular mathematics instructional materials (e.g., textbooks)	3 (0.9)	15 (2.9)	32 (3.9)	31 (4.0)	19 (2.8)
How to monitor student understanding during mathematics instruction	4 (1.2)	13 (3.0)	30 (3.9)	33 (3.8)	20 (3.6)
How to adapt mathematics instruction to address student misconceptions	7 (1.9)	12 (3.0)	30 (3.7)	33 (3.3)	18 (3.2)
How to use technology in mathematics instruction	9 (2.9)	14 (2.3)	34 (3.5)	35 (4.4)	8 (1.8)
How to use investigation-oriented tasks in mathematics instruction	8 (1.9)	22 (3.6)	35 (3.8)	22 (3.7)	12 (2.7)
How to develop students' confidence that they can successfully pursue careers in mathematics	27 (3.9)	19 (2.9)	33 (4.0)	14 (3.0)	7 (2.0)
How to incorporate real-world issues (e.g., current events, community concerns) into mathematics instruction	12 (2.3)	20 (2.8)	31 (4.3)	28 (3.9)	9 (2.3)
How to connect instruction to mathematics career opportunities	26 (3.7)	22 (2.9)	32 (4.1)	16 (3.4)	5 (1.8)
How to integrate science, engineering, mathematics, and/or computer science	18 (3.0)	20 (3.1)	39 (4.1)	14 (2.6)	9 (2.8)
How to engage students in doing mathematics (e.g., considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models)	4 (1.2)	6 (1.4)	31 (4.2)	37 (4.1)	22 (3.1)
How to incorporate students' cultural backgrounds into mathematics instruction	31 (4.1)	24 (3.1)	31 (4.5)	10 (2.6)	4 (2.1)
How to differentiate mathematics instruction to meet the needs of diverse learners	3 (1.0)	11 (2.3)	35 (3.9)	29 (4.3)	23 (4.1)

† Includes only middle schools indicating in Q23 that they offered mathematics-focused teacher study groups in the last three years.

Table MPQ 32.3
High School Mathematics-Focused Teacher Study Groups in the Last Three Years With an Emphasis in Each of a Number of Areas

	PERCENT OF SCHOOLS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
Deeping teachers' understanding of mathematics concepts	15 (2.8)	22 (4.0)	38 (4.2)	20 (3.0)	6 (1.5)
Deepening teachers' understanding of the how mathematics is done (e.g., considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models)	11 (3.1)	10 (2.0)	43 (3.9)	27 (3.5)	9 (1.9)
Deepening teachers' understanding of the state mathematics standards	10 (2.4)	9 (2.3)	28 (4.0)	34 (3.6)	18 (2.6)
Deepening teachers' understanding of how students think about various mathematical ideas	11 (3.0)	12 (2.7)	37 (4.0)	31 (3.5)	8 (1.9)
How to use particular mathematics instructional materials (e.g., textbooks)	11 (2.7)	15 (3.0)	38 (4.2)	26 (3.1)	10 (2.1)
How to monitor student understanding during mathematics instruction	11 (3.2)	11 (2.0)	37 (4.2)	31 (3.7)	11 (2.4)
How to adapt mathematics instruction to address student misconceptions	9 (3.3)	15 (3.3)	30 (3.2)	34 (3.4)	12 (2.4)
How to use technology in mathematics instruction	4 (1.4)	20 (3.9)	31 (3.6)	32 (2.9)	13 (2.5)
How to use investigation-oriented tasks in mathematics instruction	15 (3.5)	22 (2.7)	32 (3.9)	21 (3.2)	10 (2.4)
How to develop students' confidence that they can successfully pursue careers in mathematics	29 (3.6)	25 (3.4)	28 (3.1)	14 (2.5)	4 (1.5)
How to incorporate real-world issues (e.g., current events, community concerns) into mathematics instruction	18 (2.7)	21 (3.6)	33 (3.6)	18 (2.5)	10 (2.4)
How to connect instruction to mathematics career opportunities	29 (3.4)	25 (3.6)	27 (3.1)	14 (3.0)	4 (1.5)
How to integrate science, engineering, mathematics, and/or computer science	26 (3.7)	24 (2.8)	29 (3.2)	16 (3.9)	5 (1.7)
How to engage students in doing mathematics (e.g., considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models)	10 (2.5)	11 (2.0)	33 (3.5)	33 (3.5)	13 (2.4)
How to incorporate students' cultural backgrounds into mathematics instruction	35 (3.7)	30 (3.9)	21 (2.8)	9 (1.9)	5 (1.9)
How to differentiate mathematics instruction to meet the needs of diverse learners	8 (2.2)	11 (1.8)	40 (3.0)	29 (3.0)	13 (2.5)

† Includes only high schools indicating in Q23 that they offered mathematics-focused teacher study groups in the last three years.

Table MPQ 33
Use of Designated Leaders for Mathematics-Focused Teacher Study Groups

	PERCENT OF SCHOOLS†
Elementary	62 (3.7)
Middle	55 (3.9)
High	65 (3.9)

† Includes only schools indicating in Q23 that they offered mathematics-focused teacher study groups in the last three years.

Table MPQ 34
Origin of Designated Leaders of Mathematics-Focused Teacher Study Groups, by Grade Range

	PERCENT OF SCHOOLS†		
	ELEMENTARY	MIDDLE	HIGH
This school	52 (3.5)	48 (3.7)	57 (3.3)
Elsewhere in this district/diocese‡	24 (3.6)	16 (3.1)	8 (2.2)
College or University	1 (0.7)	0 ---§	0 ---§
External consultants	8 (2.3)	6 (2.0)	7 (3.3)
Other	4 (1.7)	3 (1.3)	3 (1.3)

† Includes only schools indicating in Q23 that they offered mathematics-focused teacher study groups in the last three years and indicating in Q33 that they have designated leaders for these teacher study groups.

‡ This item was presented only to public and Catholic schools.

§ No schools in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table MPQ 35
How Schools Provide Time for Mathematics Professional Development, by Grade Range

	PERCENT OF SCHOOLS		
	ELEMENTARY	MIDDLE	HIGH
Early dismissal and/or late start for students	35 (2.9)	36 (3.3)	39 (3.0)
Professional days/teacher work days during the school year	70 (2.8)	69 (3.3)	67 (3.3)
Professional days/teacher work days before and/or after the school year	53 (3.0)	54 (3.0)	57 (3.1)
Common planning time for teachers	58 (2.8)	48 (3.2)	36 (3.2)
Substitute teachers to cover teachers' classes while they attend professional development	36 (3.0)	36 (3.2)	39 (3.1)
None of the above	8 (1.7)	11 (2.2)	10 (2.4)

Table MPQ 36
Schools Providing One-on-One Mathematics-Focused Coaching

	PERCENT OF SCHOOLS
Elementary	43 (2.8)
Middle	33 (2.6)
High	29 (2.8)

Table MPQ 37
Average Percentage of Teachers in Schools Receiving One-on-One Mathematics-Focused Coaching

	AVERAGE PERCENT OF TEACHERS
Elementary	43 (3.2)
Middle	49 (3.9)
High	43 (4.8)

† Includes only schools indicating in Q36 that teachers have access to one-on-one mathematics-focused coaching.

Table MPQ 38.1
Providers of One-on-One Mathematics-Focused Coaching in Elementary Schools

	PERCENT OF SCHOOLS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
The principal of your school	39 (4.8)	9 (2.5)	28 (4.5)	12 (3.2)	12 (2.4)
An assistant principal at your school	61 (4.4)	7 (2.2)	14 (3.5)	10 (2.3)	8 (2.4)
District/Diocese administrators including mathematics supervisors/coordinators‡	35 (4.1)	14 (3.1)	21 (3.0)	15 (3.1)	15 (2.5)
Teachers/coaches who do not have classroom teaching responsibilities	19 (3.5)	7 (2.5)	16 (3.4)	15 (3.2)	43 (4.2)
Teachers/coaches who have part-time classroom teaching responsibilities	68 (4.6)	7 (2.7)	10 (2.4)	8 (2.3)	7 (2.3)
Teachers/coaches who have full-time classroom teaching responsibilities	46 (4.2)	6 (2.0)	22 (3.9)	14 (3.0)	13 (2.9)

† Includes only elementary schools indicating in Q36 that teachers have access to one-on-one mathematics-focused coaching.
‡ This item was presented only to public and Catholic schools.

Table MPQ 38.2
Providers of One-on-One Mathematics-Focused Coaching in Middle Schools

	PERCENT OF SCHOOLS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
The principal of your school	45 (5.4)	6 (1.6)	23 (4.6)	13 (3.4)	13 (2.9)
An assistant principal at your school	54 (4.3)	6 (1.7)	18 (3.5)	10 (2.8)	11 (3.2)
District/Diocese administrators including mathematics supervisors/coordinators‡	32 (4.8)	15 (3.7)	16 (3.5)	17 (3.7)	20 (4.2)
Teachers/coaches who do not have classroom teaching responsibilities	30 (4.9)	7 (3.3)	9 (2.7)	14 (3.3)	40 (4.9)
Teachers/coaches who have part-time classroom teaching responsibilities	70 (5.1)	6 (3.5)	9 (2.3)	8 (2.9)	7 (2.0)
Teachers/coaches who have full-time classroom teaching responsibilities	41 (5.7)	2 (1.0)	25 (4.7)	11 (2.9)	21 (4.2)

† Includes only middle schools indicating in Q36 that teachers have access to one-on-one mathematics-focused coaching.
‡ This item was presented only to public and Catholic schools.

Table MPQ 38.3
Providers of One-on-One Mathematics-Focused Coaching in High Schools

	PERCENT OF SCHOOLS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
The principal of your school	42 (5.7)	10 (2.2)	21 (4.2)	17 (5.8)	11 (3.4)
An assistant principal at your school	48 (5.5)	7 (1.8)	18 (3.0)	17 (5.8)	10 (3.3)
District/Diocese administrators including mathematics supervisors/coordinators‡	37 (5.7)	22 (6.9)	19 (3.9)	12 (3.9)	11 (2.7)
Teachers/coaches who do not have classroom teaching responsibilities	45 (6.0)	10 (3.0)	9 (3.4)	13 (5.7)	23 (4.9)
Teachers/coaches who have part-time classroom teaching responsibilities	61 (6.4)	10 (5.4)	11 (3.2)	6 (2.1)	12 (4.0)
Teachers/coaches who have full-time classroom teaching responsibilities	31 (5.2)	8 (3.4)	20 (4.6)	17 (4.0)	24 (3.9)

† Includes only high schools indicating in Q36 that teachers have access to one-on-one mathematics-focused coaching.
‡ This item was presented only to public and Catholic schools.

Table MPQ 39
Services Provided to Mathematics Teachers in Need of Special Assistance in Mathematics Teaching, by Grade Range

	PERCENT OF SCHOOLS		
	ELEMENTARY	MIDDLE	HIGH
Seminars, classes, and/or study groups	40 (2.9)	35 (3.3)	22 (2.5)
Guidance from a formally designated mentor or coach	51 (2.8)	46 (3.4)	48 (3.8)
A higher level of supervision than for other teachers	31 (2.8)	27 (2.8)	32 (2.9)
None of the above	30 (2.9)	36 (3.3)	36 (3.5)

Science Teacher Questionnaire
Science Teacher Questionnaire Tables

2018 NSSME+
Science Teacher Questionnaire

Teacher Background and Opinions

1. How many years have you taught prior to this school year: [Enter each response as a whole number (for example: 15).]

a.	any subject at the K–12 level?	
b.	science at the K–12 level?	
c.	at this school, any subject?	

2. At what grade levels do you currently teach science? [Select all that apply.]

☐	K–5
☐	6–8
☐	9–12
☐	I do not currently teach science.

3. *[Presented to self-contained teachers only]*
Which best describes the science instruction provided to the entire class?
   - Do not consider pull-out instruction that some students may receive for remediation or enrichment.
   - Do not consider instruction provided to individual or small groups of students, for example by an English-language specialist, special educator, or teacher assistant.

○	This class receives science instruction only from you. ***[Presented only to teachers who answered in Q2 that they teach science]***
○	This class receives science instruction from you and other teachers (for example: a science specialist or a teacher you team with). ***[Presented only to teachers who answered in Q2 that they teach science]***
○	This class receives science instruction only from another teacher (for example: a science specialist or a teacher you team with). ***[Presented only to teachers who answered in Q2 that they do not currently teach science] [Teacher ineligible, exit survey]***
○	This class does not receive science instruction this year. ***[Presented only to teachers who answered in Q2 that they do not currently teach science] [Teacher ineligible, exit survey]***

4. Omitted – Used only for survey routing.

5. *[Presented to self-contained teachers only]*
Which best describes your science teaching?

○	I teach science all or most days, every week of the year.
○	I teach science every week, but typically not every day of the week.
○	I teach science some weeks, but typically not every week. ***[Skip to Q7]***

6. *[Presented to self-contained teachers only]*
In a typical week, how many days do you teach lessons on each of the following subjects and how many minutes per week are spent on each subject? [Enter each response as a whole number (for example: 5, 150).]

	NUMBER OF DAYS PER WEEK	TOTAL NUMBER OF MINUTES PER WEEK
a. Mathematics		
b. Science		
c. Social Studies		
d. Reading/Language Arts		

7. *[Presented only to self-contained teachers who did not answer Q6]*
In a typical year, how many weeks do you teach lessons on each of the following subjects and how many minutes per week are spent on each subject? [Enter each response as a whole number (for example: 36, 150).]

	NUMBER OF WEEKS PER YEAR	AVERAGE NUMBER OF MINUTES PER WEEK WHEN TAUGHT
a. Mathematics		
b. Science		
c. Social Studies		
d. Reading/Language Arts		

8. *[Presented to non-self-contained teachers only]*
In a typical week, how many different classes (sections) of each of the following are you currently teaching? [Select one on each row.]
- If you meet with the *same class of students* multiple times per week, count that class only once.
- If you teach the *same science or engineering* course to multiple classes of students, count each class separately.

	0	1	2	3	4	5	6	7	8	9	10
Science (may include some engineering content)		○	○	○	○	○	○	○	○	○	○
Engineering	○	○	○	○	○	○	○	○	○	○	○

9. ***[Presented to non-self-contained teachers only]***
For each science class you currently teach, select the course type and enter the number of students enrolled. Enter the classes in the order that you teach them. For teachers on an alternating day block schedule, please order your classes starting with the first class you teach this week. Select one course type on each row and enter the number of students as a whole number (for example: 25).]

CLASS	COURSE TYPE	NUMBER OF STUDENTS ENROLLED
Your 1st science class:		
Your 2nd science class:		
…		
Your 10th science class:		

COURSE TYPE LIST	
1	Science (Grades K–5)
2	Life Science (Grades 6–8)
3	Earth/Space Science (Grades 6–8)
4	Physical Science (Grades 6–8)
5	General or Integrated Science (Grades 6–8)
6	Multi-discipline science courses (for example: General Science, Integrated Science, Physical Science) (Grades 9–12)
7	Earth/Space Science (Grades 9–12)
8	Life Science/Biology (Grades 9–12)
9	Environmental Science/Ecology (Grades 9–12)
10	Chemistry (Grades 9–12)
11	Physics (Grades 9–12)

10. ***[Presented to non-self-contained grades 9–12 teachers only]***
Use the descriptions below to select the level that best describes the content addressed in each grades 9–12 science class you teach. [Select one on each row.]

LEVEL	DESCRIPTION
Non-college Prep	A course that does not count towards the entrance requirements of a 4-year college. For example: Life Science.
1st Year College Prep, Including Honors	The first course in a discipline that counts towards the entrance requirements of a 4-year college. For example: Biology, Chemistry I.
2nd Year Advanced	A course typically taken after a 1st year college prep course. For example: Anatomy and Physiology, Advanced Chemistry, Physics II. Include Advanced Placement, International Baccalaureate, and concurrent college and high school credit/dual enrollment.

CLASS	COURSE TYPE	NON-COLLEGE PREP	1ST YEAR COLLEGE PREP, INCLUDING HONORS	2ND YEAR ADVANCED
Your 1st science class:	*[course type(s) teacher selected in Q9]*	○	○	○
Your 2nd science class:		○	○	○
…				
Your 10th science class:		○	○	○

11. ***[Presented to non-self-contained teachers only]***
Later in this questionnaire, we will ask you questions about your *[[x^th^]]* science class, which you indicated was *[[level indicated in Q10]] [[course type indicated in Q9]]*. What is your school's title for this course? ______________________________________

12. Have you been awarded one or more bachelor's and/or graduate degrees in the following fields? (With regard to bachelor's degrees, count only areas in which you majored. Do not include endorsements or certificates.) [Select one on each row.]

		YES	NO
a.	Education (general or subject specific such as science education)	○	○
b.	Engineering	○	○
c.	Natural Sciences (for example: biology, chemistry, physics, Earth sciences)	○	○
d.	Other, including social sciences; please specify ____________________	○	○

13. ***[Presented only to teachers that selected "Yes" for Q12a]***
What type of education degree do you have? (With regard to bachelor's degrees, count only areas in which you majored.) [Select all that apply.]

□	Elementary Education
□	Mathematics Education
□	Science Education
□	Other education, please specify. ___________

14. ***[Presented only to teachers that selected "Yes" for Q12b]***
What type of engineering degree do you have? (With regard to bachelor's degrees, count only areas in which you majored.) [Select all that apply.]

□	Aerospace/Aeronautical/Astronautical Engineering
□	Bioengineering/Biomedical Engineering
□	Chemical Engineering
□	Civil Engineering
□	Computer Engineering
□	Electrical/Electronics Engineering
□	Environmental Engineering
□	Industrial/Manufacturing Engineering
□	Mechanical Engineering
□	Other engineering, please specify ___________

15. ***[Presented only to teachers that selected "Yes" for Q12c]***
What type of natural science degree do you have? (With regard to bachelor's degrees, count only areas in which you majored.) [Select all that apply.]

☐	Biology/Life Science
☐	Chemistry
☐	Earth/Space Science
☐	Environmental Science/Ecology
☐	Physics
☐	Other natural science, please specify __________

16. Did you complete any of the following types of biology/life science courses at the undergraduate or graduate level? [Select one on each row.]

		YES	NO
a.	General/introductory biology/life science courses (for example: Biology I, Introduction to Biology, Biology for Teachers)	○	○
b.	Biology/life science courses beyond the general/introductory level	○	○
c.	Biology/life science teaching methods courses	○	○

17. ***[Presented only to teachers that selected "Yes" for Q16b]***
Please indicate which of the following biology/life science courses you completed (beyond a general/introductory course) at the undergraduate or graduate level. [Select all that apply.]

☐	Anatomy/Physiology
☐	Biochemistry
☐	Botany
☐	Cell Biology
☐	Ecology
☐	Evolution
☐	Genetics
☐	Microbiology
☐	Zoology
☐	Other biology/life science beyond the general/introductory level

18. Did you complete any of the following types of chemistry courses at the undergraduate or graduate level? [Select one on each row.]

		YES	NO
a.	General/introductory chemistry courses (for example: Chemistry I, Introduction to Chemistry)	○	○
b.	Chemistry courses beyond the general/introductory level	○	○
c.	Chemistry teaching methods courses	○	○

19. ***[Presented only to teachers that selected "Yes" for Q18b]***
Please indicate which of the following chemistry courses you completed (beyond a general/introductory course) at the undergraduate or graduate level. [Select all that apply.]

□	Analytic Chemistry
□	Biochemistry
□	Inorganic Chemistry
□	Organic Chemistry
□	Physical Chemistry
□	Quantum Chemistry
□	Other chemistry beyond the general/introductory level

20. Did you complete any of the following types of physics courses at the undergraduate or graduate level? [Select one on each row.]

		YES	NO
a.	General/introductory physics courses (for example: Physics I, Introduction to Physics)	○	○
b.	Physics courses beyond the general/introductory level	○	○
c.	Physics teaching methods courses	○	○

21. ***[Presented only to teachers that selected "Yes" for Q20b]***
Please indicate which of the following physics courses you completed (beyond a general/introductory course) at the undergraduate or graduate level. [Select all that apply.]

□	Astronomy/Astrophysics
□	Electricity and Magnetism
□	Heat and Thermodynamics
□	Mechanics
□	Modern or Quantum Physics
□	Nuclear Physics
□	Optics
□	Other physics beyond the general/introductory level

22. Did you complete any of the following types of Earth/space science courses at the undergraduate or graduate level? [Select one on each row.]

		YES	NO
a.	General/introductory Earth/space science courses (for example: Earth Science I, Introduction to Earth Science, Introductory Astronomy)	○	○
b.	Earth/space science courses beyond the general/introductory level	○	○
c.	Earth/space science teaching methods courses	○	○

23. ***[Presented only to teachers that selected "Yes" for Q22b]***
Please indicate which of the following Earth/space science courses you completed (beyond a general/introductory course) at the undergraduate or graduate level. [Select all that apply.]

□	Astronomy/Astrophysics
□	Geology
□	Meteorology
□	Oceanography
□	Physical Geography
□	Other Earth/space science beyond the general/introductory level

24. Did you complete any of the following types of environmental science courses at the undergraduate or graduate level? [Select one on each row.]

		YES	NO
a.	General/introductory environmental science courses (for example: Environmental Science I, Introduction to Environmental Science)	○	○
b.	Environmental science courses beyond the general/introductory level	○	○
c.	Environmental science teaching methods courses	○	○

25. ***[Presented only to teachers that selected "Yes" for Q24b]***
Please indicate which of the following environmental science courses you completed (beyond a general/introductory course) at the undergraduate or graduate level. [Select all that apply.]

□	Conservation Biology
□	Ecology
□	Forestry
□	Hydrology
□	Oceanography
□	Toxicology
□	Other environmental science beyond the general/introductory level

26. ***[Presented only to teachers who did not select Q12b]***
Did you complete one or more engineering courses at the undergraduate or graduate level?

○	Yes
○	No

27. Which of the following best describes the program you completed to earn your teaching credential (sometimes called certification or license)?

○	An undergraduate program leading to a bachelor's degree and a teaching credential
○	A post-baccalaureate credentialing program (no master's degree awarded)
○	A master's program that also led to a teaching credential
○	I have not completed a program to earn a teaching credential. ***[Skip to Q29]***

28. *[Presented only to high school teachers]*
In which of the following areas are you certified (have a credential, endorsement, or license) to teach at the high school level? [Select all that apply.]

□	Biology/life science
□	Chemistry
□	Earth/space science
□	Ecology/environmental science
□	Engineering
□	Physics

29. After completing your undergraduate degree and prior to becoming a teacher, did you have a full-time job in a science- or engineering-related field?

○	Yes
○	No

Professional Development

The questions in this section ask about your participation in professional development focused on science/engineering or science/engineering teaching. When answering these questions, please include:

- face-to-face and/or online courses;
- professional meetings/conferences;
- workshops;
- professional learning communities/lesson studies/teacher study groups; and
- coaching and mentoring.

Do not include:

- courses you took prior to becoming a teacher; and
- time spent providing professional development (including coaching and mentoring) for other teachers.

30. When did you **last participate** in professional development focused on science/engineering or science/engineering teaching?

○	In the last 12 months	
○	1–3 years ago	
○	4–6 years ago	*[Skip to Q35]*
○	7–10 years ago	*[Skip to Q35]*
○	More than 10 years ago	*[Skip to Q35]*
○	Never	*[Skip to Q35]*

31. **In the last 3 years,** which of the following types of professional development related to science/engineering or science/engineering teaching have you had? [Select one on each row.]

		YES	NO
a.	I attended a professional development program/workshop.	○	○
b.	I attended a national, state, or regional science teacher association meeting.	○	○
c.	I completed an online course/webinar.	○	○
d.	I participated in a professional learning community/lesson study/teacher study group	○	○
e.	I received assistance or feedback from a formally designated coach/mentor.	○	○
f.	I took a formal course for college credit.	○	○

32. What is the **total** amount of time you have spent on professional development related to science/engineering or science/engineering teaching **in the last 3 years**?

○	Less than 6 hours
○	6–15 hours
○	16–35 hours
○	36–80 hours
○	More than 80 hours

33. Considering all of your science- and engineering-related professional development **in the last 3 years**, to what extent does each of the following describe your experiences? [Select one on each row.]

		NOT AT ALL		SOMEWHAT		TO A GREAT EXTENT
a.	I had opportunities to engage in science investigations/engineering design challenges.	①	②	③	④	⑤
b.	I had opportunities to experience lessons, as my students would, from the textbook/modules I use in my classroom.	①	②	③	④	⑤
c.	I had opportunities to examine classroom artifacts (for example: student work samples, videos of classroom instruction).	①	②	③	④	⑤
d.	I had opportunities to rehearse instructional practices during the professional development (meaning: try out, receive feedback, and reflect on those practices).	①	②	③	④	⑤
e.	I had opportunities to apply what I learned to my classroom and then come back and talk about it as part of the professional development.	①	②	③	④	⑤
f.	I worked closely with other teachers from my school.	①	②	③	④	⑤
g.	I worked closely with other teachers who taught the same grade and/or subject whether or not they were from my school.	①	②	③	④	⑤

34. Thinking about all of your science- and engineering-related professional development **in the last 3 years**, to what extent was each of the following emphasized? [Select one on each row.]

		NOT AT ALL		SOMEWHAT		TO A GREAT EXTENT
a.	Deepening your own science content knowledge	①	②	③	④	⑤
b.	Deepening your understanding of how science is done (for example: developing scientific questions, developing and using models, engaging in argumentation)	①	②	③	④	⑤
c.	Deepening your understanding of how engineering is done (for example: identifying criteria and constraints, designing solutions, optimizing solutions)	①	②	③	④	⑤
d.	Implementing the science textbook/modules to be used in your classroom	①	②	③	④	⑤
e.	Learning about difficulties that students may have with particular science ideas	①	②	③	④	⑤
f.	Finding out what students think or already know prior to instruction on a topic	①	②	③	④	⑤
g.	Monitoring student understanding during science instruction	①	②	③	④	⑤
h.	Differentiating science instruction to meet the needs of diverse learners	①	②	③	④	⑤
i.	Incorporating students' cultural backgrounds into science instruction	①	②	③	④	⑤
j.	Learning how to provide science instruction that integrates engineering, mathematics, and/or computer science	①	②	③	④	⑤

Preparedness to Teach

35. ***[Presented only to grades K–5 teachers; sub-items e-h for self-contained teachers only]*** Many teachers feel better prepared to teach some subject areas than others. How well prepared do you feel to teach each of the following subjects **at the grade level(s) you teach**, whether or not they are currently included in your teaching responsibilities? [Select one on each row.]

		NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
a.	Life Science	①	②	③	④
b.	Earth/Space Science	①	②	③	④
c.	Physical Science	①	②	③	④
d.	Engineering	①	②	③	④
e.	Mathematics	①	②	③	④
f.	Reading/Language Arts	①	②	③	④
g.	Social Studies	①	②	③	④
h.	Computer Science/Programming	①	②	③	④

36. ***[Subset of items related to topic of randomly selected class presented to non-self-contained teachers]***
Within science, many teachers feel better prepared to teach some topics than others. How well prepared do you feel to teach each of the following topics **at the grade level(s) you teach**, whether or not they are currently included in your teaching responsibilities? [Select one on each row.]

	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
a. Earth/Space Science				
i. Earth's features and physical processes	①	②	③	④
ii. The solar system and the universe	①	②	③	④
iii. Climate and weather	①	②	③	④
b. Biology/Life Science				
i. Cell biology	①	②	③	④
ii. Structures and functions of organisms	①	②	③	④
iii. Ecology/ecosystems	①	②	③	④
iv. Genetics	①	②	③	④
v. Evolution	①	②	③	④
c. Chemistry				
i. Atomic structure	①	②	③	④
ii. Chemical bonding, equations, nomenclature, and reactions	①	②	③	④
iii. Elements, compounds, and mixtures	①	②	③	④
iv. The Periodic Table	①	②	③	④
v. Properties of solutions	①	②	③	④
vi. States, classes, and properties of matter	①	②	③	④
d. Physics				
i. Forces and motion	①	②	③	④
ii. Energy transfers, transformations, and conservation	①	②	③	④
iii. Properties and behaviors of waves	①	②	③	④
iv. Electricity and magnetism	①	②	③	④
v. Modern physics (for example: special relativity)	①	②	③	④
e. Engineering				
i. Defining engineering problems	①	②	③	④
ii. Developing possible solutions	①	②	③	④
iii. Optimizing a design solution	①	②	③	④
f. Environmental and resource issues (for example: land and water use, energy resources and consumption, sources and impacts of pollution)	①	②	③	④

37. How well prepared do you feel to do each of the following in your science instruction? [Select one on each row.]

		NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
a.	Develop students' conceptual understanding of the science ideas you teach	①	②	③	④
b.	Develop students' abilities to do science (for example: develop scientific questions; design and conduct investigations; analyze data; develop models, explanations, and scientific arguments)	①	②	③	④
c.	Develop students' awareness of STEM careers	①	②	③	④
d.	Provide science instruction that is based on students' ideas (whether completely correct or not) about the topics you teach	①	②	③	④
e.	Use formative assessment to monitor student learning	①	②	③	④
f.	Differentiate science instruction to meet the needs of diverse learners	①	②	③	④
g.	Incorporate students' cultural backgrounds into science instruction	①	②	③	④
h.	Encourage students' interest in science and/or engineering	①	②	③	④
i.	Encourage participation of all students in science and/or engineering	①	②	③	④

Opinions about Science Instruction

38. Please provide your opinion about each of the following statements. [Select one on each row.]

		STRONGLY DISAGREE	DISAGREE	NO OPINION	AGREE	STRONGLY AGREE
a.	Students learn science best in classes with students of similar abilities.	①	②	③	④	⑤
b.	It is better for science instruction to focus on ideas in depth, even if that means covering fewer topics.	①	②	③	④	⑤
c.	At the beginning of instruction on a science idea, students should be provided with definitions for new scientific vocabulary that will be used.	①	②	③	④	⑤
d.	Teachers should explain an idea to students before having them consider evidence that relates to the idea.	①	②	③	④	⑤
e.	Most class periods should provide opportunities for students to share their thinking and reasoning.	①	②	③	④	⑤
f.	Hands-on/laboratory activities should be used primarily to reinforce a science idea that the students have already learned.	①	②	③	④	⑤
g.	Teachers should ask students to support their conclusions about a science concept with evidence.	①	②	③	④	⑤
h.	Students learn best when instruction is connected to their everyday lives.	①	②	③	④	⑤
i.	Most class periods should provide opportunities for students to apply scientific ideas to real-world contexts.	①	②	③	④	⑤
j.	Students should learn science by doing science (for example: developing scientific questions; designing and conducting investigations; analyzing data; developing models, explanations, and scientific arguments).	①	②	③	④	⑤

Leadership Experiences

39. **In the last 3 years** have you… [Select one on each row.]

		YES	NO
a.	Served as a lead teacher or department chair in science?	○	○
b.	Served as a ***formal*** mentor or coach for a science teacher? (Do not include supervision of student teachers.)	○	○
c.	Supervised a student teacher in your classroom?	○	○
d.	Served on a school or district/diocese-wide science committee (for example: developing curriculum, developing pacing guides, selecting instructional materials)?	○	○
e.	Led or co-led a workshop or professional learning community (for example: teacher study group, lesson study) for other teachers focused on science or science teaching?	○	○
f.	Taught a science lesson for other teachers in your school to observe?	○	○
g.	Observed another teacher's science lesson for the purpose of giving him/her feedback?	○	○

Your Science Instruction

The rest of this questionnaire is about your science instruction in your *[[xth]]* science class, which you indicated is *[[level indicated in Q10]] [[type indicated in Q9]]* and is titled *[[title provided in Q11]]*. ***[Instructions presented to non-self-contained teachers only]***

40. ***[Presented to non-self-contained teachers only]***
    On average, how many minutes per week does this class meet? [Enter your response as a whole number (for example: 300).] _________

The rest of this questionnaire is about your science instruction in this randomly selected class. ***[Instructions presented to self-contained teachers only]***

41. Enter the number of students for each grade represented in this class. [Enter each response as a whole number (for example: 15).]

Kindergarten	
1st grade	
2nd grade	
3rd grade	
4th grade	
5th grade	
6th grade	
7th grade	
8th grade	
9th grade	
10th grade	
11th grade	
12th grade	

42. For the *[sum of Q41]* students in this class, indicate the number of males and females in each of the following categories of race/ethnicity. [Enter each response as a whole number (for example: 15).]

	MALES	FEMALES
a. American Indian or Alaskan Native		
b. Asian		
c. Black or African American		
d. Hispanic or Latino		
e. Native Hawaiian or Other Pacific Islander		
f. White		
g. Two or more races		

43. Which of the following best describes the prior science achievement levels of the students in this class relative to other students in this school?

○	Mostly low achievers
○	Mostly average achievers
○	Mostly high achievers
○	A mixture of levels

44. How much control do you have over each of the following for science instruction in this class? [Select one on each row.]

		NO CONTROL		MODERATE CONTROL		STRONG CONTROL
a.	Determining course goals and objectives	①	②	③	④	⑤
b.	Selecting curriculum materials (for example: textbooks/modules)	①	②	③	④	⑤
c.	Selecting content, topics, and skills to be taught	①	②	③	④	⑤
d.	Selecting the sequence in which topics are covered	①	②	③	④	⑤
e.	Determining the amount of instructional time to spend on each topic	①	②	③	④	⑤
f.	Selecting teaching techniques	①	②	③	④	⑤
g.	Determining the amount of homework to be assigned	①	②	③	④	⑤
h.	Choosing criteria for grading student performance	①	②	③	④	⑤

45. Think about your plans for this class for the entire course/year. By the end of the course/ year, how much emphasis will each of the following student objectives receive? [Select one on each row.]

		NONE	MINIMAL EMPHASIS	MODERATE EMPHASIS	HEAVY EMPHASIS
a.	Learning science vocabulary and/or facts	①	②	③	④
b.	Understanding science concepts	①	②	③	④
c.	Learning about different fields of science/engineering	①	②	③	④
d.	Learning how to do science (develop scientific questions; design and conduct investigations; analyze data; develop models, explanations, and scientific arguments)	①	②	③	④
e.	Learning how to do engineering (for example: identify criteria and constraints, design solutions, optimize solutions)	①	②	③	④
f.	Learning about real-life applications of science/engineering	①	②	③	④
g.	Increasing students' interest in science/engineering	①	②	③	④
h.	Developing students' confidence that they can successfully pursue careers in science/engineering	①	②	③	④
i.	Learning test-taking skills/strategies	①	②	③	④

46. How often do **you** do each of the following in your science instruction in this class? [Select one on each row.]

	NEVER	RARELY (FOR EXAMPLE: A FEW TIMES A YEAR)	SOMETIMES (FOR EXAMPLE: ONCE OR TWICE A MONTH)	OFTEN (FOR EXAMPLE: ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL SCIENCE LESSONS
a. Explain science ideas to the whole class	①	②	③	④	⑤
b. Engage the whole class in discussions	①	②	③	④	⑤
c. Have students work in small groups	①	②	③	④	⑤
d. Have students do hands-on/laboratory activities	①	②	③	④	⑤
e. Use flipped instruction (have students watch lectures/demonstrations outside of class to prepare for in-class activities)	①	②	③	④	⑤
f. Have students read from a textbook, module, or other material in class, either aloud or to themselves	①	②	③	④	⑤
g. Engage the class in project-based learning (PBL) activities	①	②	③	④	⑤
h. Have students write their reflections (for example: in their journals, on exit tickets) in class or for homework	①	②	③	④	⑤
i. Focus on literacy skills (for example: informational reading or writing strategies)	①	②	③	④	⑤
j. Have students practice for standardized tests	①	②	③	④	⑤

47. How often do you have **students** do each of the following during science instruction in this class? [Select one on each row.]

	NEVER	RARELY (FOR EXAMPLE: A FEW TIMES A YEAR)	SOMETIMES (FOR EXAMPLE: ONCE OR TWICE A MONTH)	OFTEN (FOR EXAMPLE: ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL SCIENCE LESSONS
a. Determine whether or not a question is "scientific" (meaning it requires an answer supported by evidence gathered through systematic investigation)	①	②	③	④	⑤
b. Generate scientific questions based on their curiosity, prior knowledge, careful observation of real-world phenomena, scientific models, or preliminary data from an investigation	①	②	③	④	⑤
c. Determine what data would need to be collected in order to answer a scientific question (regardless of who generated the question)	①	②	③	④	⑤
d. Develop procedures for a scientific investigation to answer a scientific question (regardless of who generated the question)	①	②	③	④	⑤
e. Conduct a scientific investigation (regardless of who developed the procedures)	①	②	③	④	⑤
f. Organize and/or represent data using tables, charts, or graphs in order to facilitate analysis of the data	①	②	③	④	⑤
g. Compare data from multiple trials or across student groups for consistency in order to identify potential sources of error or inconsistencies in the data	①	②	③	④	⑤
h. Analyze data using grade-appropriate methods in order to identify patterns, trends, or relationships	①	②	③	④	⑤

i.	Consider how missing data or measurement error can affect the interpretation of data	①	②	③	④	⑤
j.	Make and support claims (proposed answers to scientific questions) with evidence	①	②	③	④	⑤
k.	Use multiple sources of evidence (for example: different investigations, scientific literature) to develop an explanation	①	②	③	④	⑤
l.	Revise their explanations (claims supported by evidence and reasoning) for real-world phenomena based on additional evidence	①	②	③	④	⑤
m.	Develop scientific models—physical, graphical, or mathematical representations of real-world phenomena—based on data and reasoning	①	②	③	④	⑤
n.	Identify the strengths and limitations of a scientific model—in terms of accuracy, clarity, generalizability, accessibility to others, strength of evidence supporting it—regardless of who created the model	①	②	③	④	⑤
o.	Select and use grade-appropriate mathematical and/or statistical techniques to analyze data (for example: determining the best measure of central tendency, examining variation in data, or developing a fit line)	①	②	③	④	⑤
p.	Use mathematical and/or computational models to generate data to support a scientific claim	①	②	③	④	⑤
q.	Determine what details about an investigation (for example: its design, implementation, and results) might persuade a targeted audience about a scientific claim (regardless of who made the claim)	①	②	③	④	⑤
r.	Use data and reasoning to defend, verbally or in writing, a claim or refute alternative scientific claims about a real-world phenomenon (regardless of who made the claims)	①	②	③	④	⑤
s.	Evaluate the strengths and weaknesses of competing scientific explanations (claims supported by evidence) for a real-world phenomenon	①	②	③	④	⑤
t.	Construct a persuasive case, verbally or in writing, for the best scientific model or explanation for a real-world phenomenon	①	②	③	④	⑤
u.	Pose questions that elicit relevant details about the important aspects of a scientific argument (for example: the claims/models/explanations, research design, implementation, data analysis)	①	②	③	④	⑤
v.	Evaluate the credibility of scientific information—for example: its reliability, validity, consistency, logical coherence, lack of bias, or methodological strengths and weaknesses (regardless of whether it is from their own or others' work)	①	②	③	④	⑤
w.	Summarize patterns, similarities, and differences in scientific information obtained from multiple sources (regardless of whether it is from their own or others' work)	①	②	③	④	⑤

48. Thinking about your instruction in this class over the entire year, about how often do you incorporate engineering into your science instruction?

○	Never
○	Rarely (for example: A few times per year)
○	Sometimes (for example: Once or twice a month)
○	Often (for example: Once or twice a week)
○	All or almost all science lessons

49. Thinking about your instruction in this class over the entire year, about how often do you have students use coding to develop or revise computer programs as part of your science instruction (for example: use Scratch or Python as part of doing science)?

○	Never
○	Rarely (for example: A few times per year)
○	Sometimes (for example: Once or twice a month)
○	Often (for example: Once or twice a week)
○	All or almost all science lessons

50. In a typical week, how much time outside of this class are students expected to spend on science assignments?

○	None
○	1–15 minutes per week
○	16–30 minutes per week
○	31–60 minutes per week
○	61–90 minutes per week
○	91–120 minutes per week
○	More than 2 hours per week

51. How often are students in this class required to take science tests that you did not choose to administer, for example state assessments or district benchmarks? Do not include Advanced Placement or International Baccalaureate exams or students retaking a test because of failure.

○	Never
○	Once a year
○	Twice a year
○	Three or four times a year
○	Five or more times a year

52. Please indicate the availability of each of the following for your science instruction in this class. [Select one on each row.]

	LOCATED IN YOUR CLASSROOM	AVAILABLE IN ANOTHER ROOM	NOT AVAILABLE
a. Lab tables	○	○	○
b. Electric outlets	○	○	○
c. Faucets and sinks	○	○	○
d. Gas for burners *[Grades 9-12 only]*	○	○	○
e. Fume hoods *[Grades 9–12 only]*	○	○	○

53. Please indicate the availability of each of the following for your science instruction in this class. [Select one on each row.]

	ALWAYS AVAILABLE IN YOUR CLASSROOM	AVAILABLE UPON REQUEST	NOT AVAILABLE
a. Probes for collecting data (for example: motion sensors, temperature probes)	○	○	○
b. Microscopes	○	○	○
c. Balances (for example: pan, triple beam, digital scale)	○	○	○
d. Projection devices (for example: Smartboard, document camera, LCD projector)	○	○	○

54. Science courses may benefit from the availability of particular resources. Considering what you have available, how adequate is each of the following for teaching this science class? [Select one on each row.]

	NOT ADEQUATE		SOMEWHAT ADEQUATE		ADEQUATE
a. Instructional technology (for example: calculators, computers, probes/sensors)	①	②	③	④	⑤
b. Consumable supplies (for example: chemicals, living organisms, batteries)	①	②	③	④	⑤
c. Equipment (for example: thermometers, magnifying glasses, microscopes, beakers, photogate timers, Bunsen burners)	①	②	③	④	⑤
d. Facilities (for example: lab tables, electric outlets, faucets and sinks)	①	②	③	④	⑤

This item asks about different types of instructional materials; please read the entire list of materials before answering

55. Thinking about your instruction in this class over the entire year, about how often is instruction based on materials from each of the following sources? [Select one on each row.]

	NEVER	RARELY (FOR EXAMPLE: A FEW TIMES A YEAR)	SOMETIMES (FOR EXAMPLE: ONCE OR TWICE A MONTH)	OFTEN (FOR EXAMPLE: ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL SCIENCE LESSONS
a. Commercially published textbooks (printed or electronic), including the supplementary materials (for example: worksheets, laboratory handouts) that accompany the textbooks	①	②	③	④	⑤
b. Commercially published kits/modules (printed or electronic)	①	②	③	④	⑤
c. State, county, or district/diocese-developed units or lessons	①	②	③	④	⑤
d. Online units or courses that students work through at their own pace (for example: i-Ready, Edgenuity)	①	②	③	④	⑤
e. Lessons or resources from websites that have a subscription fee or per lesson cost (for example: BrainPOP, Discovery Ed, Teachers Pay Teachers)	①	②	③	④	⑤
f. Lessons or resources from websites that are free (for example: Khan Academy, PhET)	①	②	③	④	⑤
g. Units or lessons you created (either by yourself or with others)	①	②	③	④	⑤
h. Units or lessons you collected from any other source (for example: conferences, journals, colleagues, university or museum partners)	①	②	③	④	⑤

56. Does your school/district/diocese designate instructional materials (textbooks, kits, modules, units, or lessons) to be used in this class?

○	Yes
○	No *[Skip to Q58]*

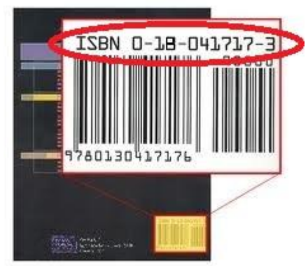
57. Which of the following types of instructional materials does your school/district/diocese designate to be used in this class? [Select all that apply.]

□	Commercially published textbooks (printed or electronic), including the supplementary materials (for example: worksheets, laboratory handouts) that accompany the textbooks
□	Commercially published kits/modules (printed or online)
□	State, county, or district/diocese-developed instructional materials
□	Online units or courses that students work through at their own pace (for example: i-Ready, Edgenuity)
□	Lessons or resources from websites that have a subscription fee or per lesson cost (for example: BrainPOP, Discovery Ed, Teachers Pay Teachers)
□	Lessons or resources from websites that are free (for example: Khan Academy, PhET)

58. Omitted – Used only for survey routing.

59. ***[Presented only to teachers who selected "Sometimes" "Often" or "All" for Q55a, b, or d]***
[Version for teachers who indicate using a commercial textbook most often] Please indicate the title, author, most recent copyright year, and ISBN code of the commercially published textbook or kits/modules (printed or electronic) used <u>most often</u> by the students in this class.

- If you use multiple kits/modules, select one to enter the information for.
- The 10- or 13-character ISBN code can be found on the copyright page and/or the back cover of the textbook or kit/module.
- Do not include the dashes when entering the ISBN.
- Example ISBN:



[Version for teachers who indicate using an online course most often] Please indicate the title and URL of the online units or courses used <u>most often</u> by the students in this class.

Title:	
First Author: [for teachers who indicate using a commercial textbook most often]	
Year: [for teachers who indicate using a commercial textbook most often]	
ISBN: [for teachers who indicate using a commercial textbook most often]	
URL: [for teachers who indicate using an online program most often]	

60. Please rate how each of the following affects your science instruction in this class. [Select one on each row.]

		INHIBITS EFFECTIVE INSTRUCTION		NEUTRAL OR MIXED		PROMOTES EFFECTIVE INSTRUCTION	N/A
a.	Current state standards	①	②	③	④	⑤	○
b.	District/diocese and/or school pacing guides	①	②	③	④	⑤	○
c.	State/district/diocese testing/accountability policies ***[Not presented to non-Catholic private schools]***	①	②	③	④	⑤	○
d.	Textbook/module selection policies	①	②	③	④	⑤	○
e.	Teacher evaluation policies	①	②	③	④	⑤	○
f.	College entrance requirements **[Presented to grades 9–12 teachers only]**	①	②	③	④	⑤	○
g.	Students' prior knowledge and skills	①	②	③	④	⑤	○
h.	Students' motivation, interest, and effort in science	①	②	③	④	⑤	○
i.	Parent/guardian expectations and involvement	①	②	③	④	⑤	○
j.	Principal support	①	②	③	④	⑤	○
k.	Amount of time for you to plan, individually and with colleagues	①	②	③	④	⑤	○
l.	Amount of time available for your professional development	①	②	③	④	⑤	○
m.	Amount of instructional time devoted to science **[Presented to grades K–5 teachers only]**	①	②	③	④	⑤	○

Your Most Recently Completed Science Unit in this Class

The questions in this section are about the most recently completed science unit in this class which you indicated is *[level indicated in Q10] [type indicated in Q9]* and is titled *[title provided in Q11]*.

- Depending on the structure of your class and the instructional materials you use, a unit may range from a few to many class periods.
- Do not be concerned if this unit was not typical of your instruction.

61. Which one of the following best describes the content of this unit?

○	Earth/space science
○	Life science/biology
○	Environmental science/ecology
○	Chemistry
○	Physics
○	Engineering

62. *[Presented only to teachers who selected "Sometimes" "Often" or "All" for Q55a, b, or c]* Was this unit based primarily on a commercially published textbook/kit/module or state, county, or district/diocese-developed materials?

○	Yes
○	No *[Skip to Q66]*

This next set of items is about the commercially published textbook/kit/module or state, county, or district/diocese-developed lessons you used in this unit.

63. Please indicate the extent to which you did each of the following while teaching this unit. [Select one on each row.]

		NOT AT ALL		SOMEWHAT		TO A GREAT EXTENT
a.	I used these materials to guide the structure and content emphasis of the unit.	①	②	③	④	⑤
b.	I picked what is important from these materials and skipped the rest.	①	②	③	④	⑤
c.	I incorporated activities (for example: problems, investigations, readings) from other sources to supplement what these materials were lacking.	①	②	③	④	⑤
d.	I modified activities from these materials.	①	②	③	④	⑤

64. *[Presented only to teachers who did not select "Not at all" for Q63b]* During this unit, when you skipped activities (for example: problems, investigations, readings) in these materials, how much was each of the following a factor in your decisions? [Select one on each row.]

		NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
a.	The science ideas addressed in the activities I skipped are not included in my pacing guide/standards.	①	②	③
b.	I did not have the materials needed to implement the activities I skipped.	①	②	③
c.	I did not have the knowledge needed to implement the activities I skipped			
d.	The activities I skipped were too difficult for my students.	①	②	③
e.	My students already knew the science ideas or were able to learn them without the activities I skipped.	①	②	③
f.	I have different activities for those science ideas that work better than the ones I skipped.	①	②	③
g.	I did not have enough instructional time for the activities I skipped.	①	②	③

65. *[Presented only to teachers who did not select "Not at all" for Q63c]*
During this unit, when you supplemented these materials with additional activities, how much was each of the following a factor in your decisions? [Select one on each row.]

		NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
a.	My pacing guide indicated that I should use supplemental activities.	①	②	③
b.	Supplemental activities were needed to prepare students for standardized tests.	①	②	③
c.	Supplemental activities were needed to provide students with additional practice.	①	②	③
d.	Supplemental activities were needed so students at different levels of achievement could increase their understanding of the ideas targeted in each activity.	①	②	③
e.	I had additional activities that I liked.	①	②	③

66. *[Presented only to teachers who did not select "Not at all" in Q63d]*
During this unit, when you modified activities from these materials, how much was each of the following a factor in your decisions? [Select one on each row.]

		NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
a.	I did not have the necessary materials/supplies for the original activities.	①	②	③
b.	The original activities were too difficult conceptually for my students.	①	②	③
c.	The original activities were too easy conceptually for my students.	①	②	③
d.	I did not have enough instructional time to implement the activities as designed.	①	②	③
e.	The original activities were too structured for my students.	①	②	③
f.	The original activities were not structured enough for my students.	①	②	③

67. How well prepared did you feel to do each of the following as part of your instruction on this particular unit? [Select one on each row.]

		NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
a.	Anticipate difficulties that students may have with particular science ideas and procedures in this unit	①	②	③	④
b.	Find out what students thought or already knew about the key science ideas	①	②	③	④
c.	Implement the instructional materials (for example: textbook, module) to be used during this unit	①	②	③	④
d.	Monitor student understanding during this unit	①	②	③	④
e.	Assess student understanding at the conclusion of this unit	①	②	③	④

Your Most Recent Science Lesson in this Class

The next set of questions refer to the most recent science lesson in this class which you indicated is *[level indicated in Q10] [type indicated in Q9]* and is titled *[title provided in Q11]*, even if it included activities and/or interruptions that are not typical (for example: a test, students working on projects, a fire drill). If the lesson spanned multiple days, please answer for the most recent day.

68. How many minutes was that day's science lesson? Answer for the entire length of the class period, even if there were interruptions. [Enter your response as a non-zero whole number (for example: 50).] __________

69. Of these *[[answer to Q68]]* minutes, how many were spent on the following: [Enter each response as a whole number (for example: 15).]

a.	Non-instructional activities (for example: attendance taking, interruptions)	
b.	Whole class activities (for example: lectures, explanations, discussions)	
c.	Small group work	
d.	Students working individually (for example: reading textbooks, completing worksheets, taking a test or quiz)	

70. Which of the following activities took place during that day's science lesson? [Select all that apply.]

◻	Teacher explaining a science idea to the whole class
◻	Teacher conducting a demonstration while students watched
◻	Whole class discussion
◻	Students working in small groups
◻	Students completing textbook/worksheet problems
◻	Students doing hands-on/laboratory activities
◻	Students reading about science
◻	Students writing about science (do not include students taking notes)
◻	Practicing for standardized tests
◻	Test or quiz
◻	None of the above

Demographic Information

71. Are you:

○	Female
○	Male
○	Other

72. Are you of Hispanic or Latino origin?

○	Yes
○	No

73. What is your race? [Select all that apply.]

☐	American Indian or Alaskan Native
☐	Asian
☐	Black or African American
☐	Native Hawaiian or Other Pacific Islander
☐	White

74. In what year were you born? [Enter your response as a whole number (for example: 1969).]

____

Thank you!

Science Teacher Questionnaire Tables

Table STQ 1
Number of Years Science Teachers Spent Teaching Prior to This School Year, by Grade Range

	MEAN NUMBER OF YEARS		
	ELEMENTARY	MIDDLE	HIGH
Any subject at the K–12 level	13 (0.3)	13 (0.5)	13 (0.3)
Science at the K–12 level	12 (0.3)	11 (0.4)	13 (0.3)
At this school, any subject	9 (0.3)	8 (0.4)	9 (0.2)

Table STQ 2
Grade Levels Taught by Science Teachers

	PERCENT OF TEACHERS
Grades K–5	79 (0.8)
Grades 6–8	12 (0.6)
Grades 9–12	12 (0.5)

Table STQ 3
Instructional Arrangements for Science in Self-Contained Elementary School Classes

	PERCENT OF TEACHERS
This class receives science instruction only from you.	84 (1.8)
This class receives science instruction from you and other teachers (e.g., a science specialist or a teacher you team with).	16 (1.8)

There is no table for STQ 4.

Table STQ 5
Frequency With Which Self-Contained Elementary School Teachers Provide Science Instruction

	PERCENT OF TEACHERS
I teach science all or most days, every week of the year.	18 (1.5)
I teach science every week, but typically not every day of the week.	43 (2.1)
I teach science some weeks, but typically not every week.	39 (1.9)

Table STQ 6 and 7

Average Number of Minutes Per Day Spent Teaching Each Subject in Self-Contained Elementary School Classes†

	AVERAGE NUMBER OF MINUTES
Mathematics	59 (0.9)
Science	21 (0.6)
Social Studies	17 (0.5)
Reading/Language Arts	86 (1.7)

† Includes only self-contained elementary teachers who indicated they teach reading/language arts, mathematics, science, and social studies to one class of students.

Table STQ 8.1

Number of Sections of Science and Engineering Classes Taught Per Week by Non-Self-Contained Elementary School Teachers

	PERCENT OF TEACHERS	
	SCIENCE	ENGINEERING
0 Sections	n/a	82 (4.5)
1 Section	20 (7.3)	2 (1.0)
2 Sections	42 (5.9)	10 (3.6)
3 Sections	24 (4.6)	4 (1.7)
4 Sections	5 (1.7)	1 (0.6)
5 Sections	2 (0.9)	0 (0.2)
6 Sections	1 (0.6)	0 ---†
7 Sections	0 ---†	0 ---†
8 Sections	1 (0.7)	1 (0.6)
9 Sections	1 (1.1)	0 ---†
10 Sections	5 (2.6)	1 (0.8)

† No non-self-contained elementary school science teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table STQ 8.2
Number of Sections of Science and Engineering Classes Taught Per Week by Middle School Teachers

	PERCENT OF TEACHERS	
	SCIENCE	ENGINEERING
0 Sections	n/a	90 (1.5)
1 Section	6 (1.2)	3 (0.6)
2 Sections	10 (1.6)	2 (0.8)
3 Sections	14 (2.1)	1 (0.6)
4 Sections	23 (2.4)	1 (0.2)
5 Sections	25 (2.3)	1 (0.4)
6 Sections	19 (1.9)	1 (0.3)
7 Sections	2 (0.5)	0 ---†
8 Sections	0 (0.2)	0 ---†
9 Sections	0 (0.3)	0 (0.1)
10 Sections	0 (0.2)	0 (0.1)

† No middle school science teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table STQ 8.3
Number of Sections of Science and Engineering Classes Taught Per Week by High School Teachers

	PERCENT OF TEACHERS	
	SCIENCE	ENGINEERING
0 Sections	n/a	93 (0.8)
1 Section	5 (0.7)	3 (0.5)
2 Sections	7 (0.9)	2 (0.5)
3 Sections	19 (1.6)	1 (0.1)
4 Sections	16 (1.5)	1 (0.3)
5 Sections	26 (1.7)	0 (0.1)
6 Sections	22 (1.5)	0 (0.0)
7 Sections	4 (0.6)	0 (0.2)
8 Sections	0 (0.1)	0 ---†
9 Sections	0 (0.0)	0 ---†
10 Sections	0 (0.1)	0 (0.1)

† No high school science teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

There is no table for STQ 9.

There is no table for STQ 10.

There is no table for STQ 11.

Table STQ 12
Subjects of Science Teachers' Degrees, by Grade Range

	PERCENT OF TEACHERS		
	ELEMENTARY	MIDDLE	HIGH
Education (general or subject specific such as science education)	95 (0.8)	80 (1.9)	70 (1.6)
Engineering	0 (0.1)	3 (1.4)	3 (0.4)
Natural Sciences (e.g., biology, chemistry, physics, Earth sciences)	3 (0.5)	39 (2.2)	77 (1.5)
Other Subject	18 (1.3)	22 (2.0)	17 (1.3)

Table STQ 13
Science Teachers With Education Degrees, by Grade Range

	PERCENT OF TEACHERS†		
	ELEMENTARY	MIDDLE	HIGH
Elementary Education	90 (1.5)	35 (2.7)	2 (0.5)
Mathematics Education	0 (0.3)	5 (1.6)	3 (1.0)
Science Education	1 (0.3)	36 (2.8)	57 (2.1)
Other Education	21 (1.7)	30 (2.4)	22 (1.9)

† Teachers indicating in Q12 that they do not have an education degree are treated as not having a degree in these areas.

Table STQ 14
Science Teachers With Engineering Degrees, by Grade Range

	PERCENT OF TEACHERS†		
	ELEMENTARY	MIDDLE	HIGH
Aerospace/Aeronautical/Astronautical Engineering	0 ---‡	2 (1.5)	0 (0.0)
Bioengineering/Biomedical Engineering	0 ---‡	0 ---‡	0 (0.1)
Chemical Engineering	0 ---‡	0 ---‡	1 (0.3)
Civil Engineering	0 ---‡	2 (1.4)	0 (0.1)
Computer Engineering	0 ---‡	0 ---‡	0 ---‡
Electrical/Electronics Engineering	0 ---‡	0 (0.1)	0 (0.1)
Environmental Engineering	0 ---‡	0 ---‡	0 (0.1)
Industrial/Manufacturing Engineering	0 ---‡	0 (0.2)	0 (0.1)
Mechanical Engineering	0 ---‡	0 ---‡	0 (0.1)
Other engineering	0 (0.1)	0 (0.1)	1 (0.4)

† Teachers indicating in Q12 that they do not have an engineering degree are treated as not having a degree in this area.

‡ No science teachers at this grade range in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table STQ 15
Science Teachers With Natural Science Degrees, by Grade Range

	PERCENT OF TEACHERS†		
	ELEMENTARY	MIDDLE	HIGH
Biology/Life Science	1 (0.4)	25 (2.0)	47 (1.7)
Chemistry	0 (0.1)	4 (0.9)	16 (1.2)
Earth/Space Science	0 (0.2)	3 (0.5)	4 (0.7)
Environmental Science/Ecology	0 (0.0)	4 (1.0)	4 (0.6)
Physics	0 (0.1)	1 (0.2)	6 (0.6)
Other natural science	1 (0.4)	8 (1.1)	11 (1.1)

† Teachers indicating in Q12 that they do not have a natural science degree are treated as not having a degree in this area.

Table STQ 16
Biology/Life Science College Courses Completed by Science Teachers, by Grade Range

	PERCENT OF TEACHERS		
	ELEMENTARY	MIDDLE	HIGH
General/introductory biology/life science courses (e.g., Biology I, Introduction to Biology, Biology for Teachers)	85 (1.4)	88 (2.0)	92 (0.8)
Biology/life science courses beyond the general/introductory level	29 (1.8)	65 (2.3)	79 (1.5)
Biology/life science teaching methods courses	40 (2.0)	52 (2.2)	52 (1.7)

Table STQ 17
Advanced Biology/Life Science College Courses Completed by Science Teachers, by Grade Range

	PERCENT OF TEACHERS†		
	ELEMENTARY	MIDDLE	HIGH
Anatomy/Physiology	13 (1.4)	37 (2.1)	51 (1.8)
Biochemistry	2 (0.6)	22 (2.0)	43 (1.9)
Botany	3 (0.7)	27 (2.1)	40 (1.7)
Cell Biology	5 (0.8)	34 (2.3)	50 (1.7)
Ecology	6 (0.9)	34 (2.6)	50 (1.8)
Evolution	2 (0.5)	21 (2.1)	32 (1.8)
Genetics	4 (0.7)	33 (2.2)	56 (1.7)
Microbiology	4 (0.8)	28 (1.7)	48 (1.7)
Zoology	4 (0.8)	24 (1.9)	37 (1.6)
Other biology/life science beyond the general/introductory level	13 (1.2)	33 (2.3)	45 (1.9)

† Teachers indicating in Q16 that they have not taken biology/life science courses beyond the general/introductory level are treated as not having taken any of these courses.

Table STQ 18
Chemistry College Courses Completed by Science Teachers, by Grade Range

	PERCENT OF TEACHERS		
	ELEMENTARY	MIDDLE	HIGH
General/introductory chemistry courses (e.g., Chemistry I, Introduction to Chemistry)	44 (1.8)	79 (2.2)	95 (0.6)
Chemistry courses beyond the general/introductory level	6 (0.8)	41 (2.3)	72 (1.7)
Chemistry teaching methods courses	5 (0.9)	15 (1.9)	23 (1.3)

Table STQ 19
Advanced Chemistry College Courses Completed by Science Teachers, by Grade Range

	PERCENT OF TEACHERS†		
	ELEMENTARY	MIDDLE	HIGH
Analytic Chemistry	0 (0.2)	7 (1.2)	25 (1.2)
Biochemistry	2 (0.4)	20 (2.0)	40 (1.7)
Inorganic Chemistry	2 (0.6)	18 (1.7)	42 (1.8)
Organic Chemistry	3 (0.6)	32 (2.1)	64 (1.7)
Physical Chemistry	2 (0.5)	12 (1.4)	26 (1.3)
Quantum Chemistry	0 (0.1)	2 (0.4)	7 (0.6)
Other chemistry beyond the general/introductory level	1 (0.3)	8 (1.0)	17 (1.5)

† Teachers indicating in Q18 that they have not taken chemistry courses beyond the general/introductory level are treated as not having taken any of these courses.

Table STQ 20
Physics College Courses Completed by Science Teachers, by Grade Range

	PERCENT OF TEACHERS		
	ELEMENTARY	MIDDLE	HIGH
General/introductory physics courses (e.g., Physics I, Introduction to Physics)	29 (1.6)	67 (2.4)	84 (1.4)
Physics courses beyond the general/introductory level	3 (0.5)	19 (1.8)	31 (1.6)
Physics teaching methods courses	5 (0.8)	16 (1.9)	15 (1.3)

Table STQ 21
Advanced Physics College Courses Completed by Science Teachers, by Grade Range

	PERCENT OF TEACHERS†		
	ELEMENTARY	MIDDLE	HIGH
Astronomy/Astrophysics	1 (0.3)	10 (1.4)	13 (1.1)
Electricity and Magnetism	0 (0.2)	6 (1.0)	17 (1.1)
Heat and Thermodynamics	0 (0.1)	6 (1.3)	14 (1.2)
Mechanics	0 (0.3)	6 (1.3)	19 (1.3)
Modern or Quantum Physics	0 (0.2)	3 (0.7)	13 (1.0)
Nuclear Physics	0 ---‡	1 (0.3)	6 (0.7)
Optics	0 (0.1)	2 (0.7)	9 (1.2)
Other physics beyond the general/introductory level	1 (0.4)	8 (0.9)	13 (1.2)

† Teachers indicating in Q20 that they have not taken physics courses beyond the general/introductory level are treated as not having taken any of these courses.

‡ No elementary school science teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table STQ 22
Earth/Space Science College Courses Completed by Science Teachers, by Grade Range

	PERCENT OF TEACHERS		
	ELEMENTARY	MIDDLE	HIGH
General/introductory Earth/space science courses (e.g., Earth Science I, Introduction to Earth Science, Introductory Astronomy)	63 (1.5)	68 (2.6)	58 (1.6)
Earth/space science courses beyond the general/introductory level	10 (1.0)	29 (2.1)	24 (1.4)
Earth/space science teaching methods courses	15 (1.2)	22 (1.8)	11 (1.1)

Table STQ 23
Advanced Earth/Space Science College Courses Completed by Science Teachers, by Grade Range

	PERCENT OF TEACHERS†		
	ELEMENTARY	MIDDLE	HIGH
Astronomy/Astrophysics	4 (0.7)	15 (1.7)	13 (1.2)
Geology	5 (0.8)	22 (1.8)	19 (1.3)
Meteorology	1 (0.4)	9 (1.4)	9 (1.0)
Oceanography	2 (0.5)	8 (0.9)	8 (0.9)
Physical Geography	4 (0.7)	13 (1.6)	9 (1.0)
Other Earth/space science beyond the general/introductory level	2 (0.4)	11 (1.3)	11 (1.1)

† Teachers indicating in Q22 that they have not taken Earth/space science courses beyond the general/introductory level are treated as not having taken any of these courses.

Table STQ 24
Environmental Science College Courses Completed by Science Teachers, by Grade Range

	PERCENT OF TEACHERS		
	ELEMENTARY	MIDDLE	HIGH
General/introductory environmental science courses (e.g., Environmental Science I, Introduction to Environmental Science)	37 (1.7)	55 (2.4)	52 (1.2)
Environmental science courses beyond the general/introductory level	5 (0.8)	19 (1.7)	26 (1.4)
Environmental science teaching methods courses	9 (1.4)	14 (1.9)	7 (0.6)

Table STQ 25
Advanced Environmental Science College Courses Completed by Science Teachers, by Grade Range

	PERCENT OF TEACHERS†		
	ELEMENTARY	MIDDLE	HIGH
Conservation Biology	1 (0.5)	8 (1.2)	11 (0.9)
Ecology	2 (0.6)	15 (1.4)	22 (1.3)
Forestry	1 (0.3)	4 (1.3)	5 (1.0)
Hydrology	0 (0.0)	3 (0.6)	4 (0.6)
Oceanography	1 (0.3)	5 (0.6)	8 (1.0)
Toxicology	0 (0.2)	2 (0.4)	3 (0.5)
Other environmental science beyond the general/introductory level	2 (0.6)	8 (1.2)	13 (1.1)

† Teachers indicating in Q24 that they have not taken environmental science courses beyond the general/introductory level are treated as not having taken any of these courses.

Table STQ 26
Science Teachers Having Completed One or More College Courses in Engineering

	PERCENT OF TEACHERS
Elementary	3 (0.5)
Middle	10 (1.7)
High	13 (1.1)

Table STQ 27
Science Teachers' Paths to Certification, by Grade Range

	PERCENT OF TEACHERS		
	ELEMENTARY	MIDDLE	HIGH
An undergraduate program leading to a bachelor's degree and a teaching credential	65 (1.9)	53 (2.8)	40 (1.9)
A post-baccalaureate credentialing program (no master's degree awarded)	11 (1.5)	20 (2.3)	25 (1.7)
A master's program that also led to a teaching credential	22 (1.8)	24 (2.7)	28 (2.2)
I have not completed a program to earn a teaching credential.	1 (0.5)	4 (1.3)	7 (1.0)

Table STQ 28
High School Science Teachers' Areas of Certification

	PERCENT OF TEACHERS
Biology/life science	71 (1.6)
Chemistry	51 (2.2)
Earth/space science	37 (2.1)
Ecology/environmental science	32 (2.0)
Engineering	5 (0.8)
Physics	33 (1.6)

Table STQ 29
Science Teachers With Full-Time Job Experience in a Science- or Engineering-Related Field Prior to Teaching

	PERCENT OF TEACHERS
Elementary	3 (0.7)
Middle	23 (2.8)
High	36 (2.1)

Table STQ 30
Science Teachers' Most Recent Participation in Science/Engineering-Focused Professional Development, by Grade Range

	PERCENT OF TEACHERS		
	ELEMENTARY	MIDDLE	HIGH
In the last 12 months	36 (2.2)	57 (2.5)	59 (1.8)
1–3 years ago	22 (1.7)	21 (2.2)	24 (1.5)
4–6 years ago	8 (1.2)	6 (1.4)	5 (0.8)
7–10 years ago	5 (0.7)	2 (0.8)	2 (0.4)
More than 10 years ago	6 (1.0)	3 (0.8)	2 (0.6)
Never	24 (1.5)	11 (1.6)	7 (0.9)

Table STQ 31
Science Teachers Participating in Various Science/Engineering-Focused Professional Development Activities in the Last Three Years, by Grade Range

	PERCENT OF TEACHERS†		
	ELEMENTARY	MIDDLE	HIGH
I attended a professional development program/workshop.	89 (2.0)	94 (1.2)	91 (1.5)
I attended a national, state, or regional science teacher association meeting.	12 (1.8)	37 (3.2)	40 (2.0)
I completed an online course/webinar.	9 (1.5)	29 (3.0)	34 (2.2)
I participated in a professional learning community/lesson study/teacher study group.	42 (2.9)	61 (3.1)	55 (1.7)
I received assistance or feedback from a formally designated coach/mentor.	28 (2.6)	33 (3.4)	35 (2.1)
I took a formal course for college credit.	5 (1.3)	9 (1.5)	16 (1.4)

† Includes only science teachers indicating in Q30 that they participated in science/engineering-focused professional development in the last three years.

Table STQ 32
Time Spent by Science Teachers on Science/Engineering-Focused Professional Development in the Last Three Years, by Grade Range

	PERCENT OF TEACHERS†		
	ELEMENTARY	MIDDLE	HIGH
Less than 6 hours	35 (2.5)	10 (1.4)	10 (1.5)
6–15 hours	36 (2.4)	30 (2.6)	22 (1.9)
16–35 hours	22 (2.0)	27 (2.1)	26 (1.5)
36–80 hours	6 (1.3)	20 (1.9)	25 (1.7)
More than 80 hours	2 (0.6)	13 (1.5)	16 (1.1)

† Includes only science teachers indicating in Q30 that they participated in science/engineering-focused professional development in the last three years.

Table STQ 33.1
Elementary School Science Teachers' Descriptions of Science/Engineering-Focused Professional Development in the Last Three Years

	PERCENT OF TEACHERS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
I had opportunities to engage in science investigations/engineering design challenges.	18 (2.3)	13 (2.1)	32 (2.8)	25 (2.6)	13 (2.4)
I had opportunities to experience lessons, as my students would, from the textbook/modules I use in my classroom.	21 (2.3)	12 (2.1)	24 (2.5)	29 (3.0)	14 (2.0)
I had opportunities to examine classroom artifacts (e.g., student work samples, videos of classroom instruction).	23 (2.8)	15 (2.4)	32 (2.9)	22 (2.6)	8 (1.6)
I had opportunities to rehearse instructional practices during the professional development (i.e., try out, receive feedback, and reflect on those practices).	32 (2.5)	20 (2.2)	26 (2.3)	17 (2.0)	6 (1.5)
I had opportunities to apply what I learned to my classroom and then come back and talk about it as part of the professional development.	32 (2.9)	16 (2.3)	22 (2.2)	21 (2.2)	10 (1.8)
I worked closely with other teachers from my school.	12 (1.7)	12 (1.8)	19 (2.8)	29 (3.0)	28 (2.8)
I worked closely with other teachers who taught the same grade and/or subject whether or not they were from my school.	19 (2.5)	11 (1.8)	23 (2.3)	27 (2.8)	20 (2.4)

† Includes only elementary school science teachers indicating in Q30 that they participated in science/engineering-focused professional development in the last three years.

Table STQ 33.2
Middle School Science Teachers' Descriptions of Science/Engineering-Focused Professional Development in the Last Three Years

	PERCENT OF TEACHERS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
I had opportunities to engage in science investigations/engineering design challenges.	9 (1.4)	9 (2.3)	36 (3.3)	30 (3.3)	16 (2.1)
I had opportunities to experience lessons, as my students would, from the textbook/modules I use in my classroom.	18 (2.9)	11 (1.6)	31 (2.7)	24 (2.6)	17 (2.7)
I had opportunities to examine classroom artifacts (e.g., student work samples, videos of classroom instruction).	13 (1.9)	16 (2.2)	33 (2.8)	27 (3.0)	11 (2.6)
I had opportunities to rehearse instructional practices during the professional development (i.e., try out, receive feedback, and reflect on those practices).	25 (2.9)	15 (1.6)	33 (3.1)	17 (1.9)	10 (2.0)
I had opportunities to apply what I learned to my classroom and then come back and talk about it as part of the professional development.	20 (2.1)	13 (2.3)	27 (2.9)	29 (3.0)	11 (1.8)
I worked closely with other teachers from my school.	9 (2.8)	9 (1.9)	20 (2.6)	30 (2.5)	32 (3.0)
I worked closely with other teachers who taught the same grade and/or subject whether or not they were from my school.	7 (1.2)	14 (2.6)	26 (2.3)	28 (2.4)	25 (2.8)

† Includes only middle school science teachers indicating in Q30 that they participated in science/engineering-focused professional development in the last three years.

Table STQ 33.3
High School Science Teachers' Descriptions of Science/Engineering-Focused Professional Development in the Last Three Years

	PERCENT OF TEACHERS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
I had opportunities to engage in science investigations/engineering design challenges.	13 (1.2)	8 (1.1)	33 (2.1)	28 (2.0)	18 (2.0)
I had opportunities to experience lessons, as my students would, from the textbook/modules I use in my classroom.	17 (1.9)	12 (1.3)	25 (2.4)	27 (1.8)	18 (1.8)
I had opportunities to examine classroom artifacts (e.g., student work samples, videos of classroom instruction).	15 (1.7)	16 (1.5)	29 (1.7)	25 (1.7)	14 (1.7)
I had opportunities to rehearse instructional practices during the professional development (i.e., try out, receive feedback, and reflect on those practices).	22 (2.2)	18 (1.5)	24 (1.9)	24 (2.2)	11 (1.6)
I had opportunities to apply what I learned to my classroom and then come back and talk about it as part of the professional development.	19 (1.6)	14 (1.4)	24 (1.9)	29 (2.3)	14 (1.4)
I worked closely with other teachers from my school.	12 (1.6)	9 (1.3)	24 (1.7)	24 (1.6)	31 (2.2)
I worked closely with other teachers who taught the same grade and/or subject whether or not they were from my school.	10 (1.4)	11 (1.6)	25 (1.9)	28 (2.2)	26 (1.9)

† Includes only high school science teachers indicating in Q30 that they participated in science/engineering-focused professional development in the last three years.

Table STQ 34.1
Elementary School Science Teachers' Perceptions of Topics Emphasized During Professional Development in the Last Three Years

	PERCENT OF TEACHERS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
Deepening your own science content knowledge	8 (2.0)	16 (2.5)	36 (3.1)	25 (2.3)	15 (2.0)
Deepening your understanding of how science is done (e.g., developing scientific questions, developing and using models, engaging in argumentation)	12 (1.9)	14 (1.8)	35 (3.0)	27 (3.0)	12 (1.7)
Deepening your understanding of how engineering is done (e.g., identifying criteria and constraints, designing solutions, optimizing solutions)	30 (2.9)	21 (2.6)	24 (2.4)	18 (2.7)	7 (1.5)
Implementing the science textbook/modules to be used in your classroom	22 (2.7)	16 (2.3)	27 (2.7)	23 (2.5)	11 (2.2)
Learning about difficulties that students may have with particular science ideas	28 (3.0)	17 (2.6)	29 (3.5)	21 (3.1)	5 (1.3)
Finding out what students think or already know prior to instruction on a topic	16 (2.2)	14 (2.1)	35 (2.7)	25 (2.8)	10 (2.1)
Monitoring student understanding during science instruction	15 (2.3)	12 (2.1)	33 (2.8)	30 (3.2)	11 (1.8)
Differentiating science instruction to meet the needs of diverse learners	21 (2.7)	16 (2.1)	30 (2.6)	24 (2.8)	9 (1.6)
Incorporating students' cultural backgrounds into science instruction	33 (2.8)	21 (2.3)	27 (3.1)	13 (2.1)	6 (1.3)
Learning how to provide science instruction that integrates engineering, mathematics, and/or computer science	19 (2.6)	16 (2.1)	29 (2.8)	24 (3.0)	12 (1.9)

† Includes only elementary school science teachers indicating in Q30 that they participated in science/engineering-focused professional development in the last three years.

Table STQ 34.2
Middle School Science Teachers' Perceptions of Topics Emphasized During Professional Development in the Last Three Years

	PERCENT OF TEACHERS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
Deepening your own science content knowledge	4 (0.9)	11 (2.1)	34 (2.6)	31 (3.1)	20 (2.4)
Deepening your understanding of how science is done (e.g., developing scientific questions, developing and using models, engaging in argumentation)	3 (0.9)	11 (2.4)	27 (3.0)	40 (3.3)	18 (2.3)
Deepening your understanding of how engineering is done (e.g., identifying criteria and constraints, designing solutions, optimizing solutions)	17 (1.9)	17 (2.2)	33 (3.2)	25 (3.4)	9 (1.9)
Implementing the science textbook/modules to be used in your classroom	23 (3.0)	18 (2.8)	28 (2.8)	18 (2.1)	13 (2.5)
Learning about difficulties that students may have with particular science ideas	14 (2.3)	19 (2.7)	32 (2.9)	27 (2.9)	8 (1.2)
Finding out what students think or already know prior to instruction on a topic	8 (1.3)	19 (2.9)	30 (2.9)	35 (3.7)	7 (1.0)
Monitoring student understanding during science instruction	7 (1.2)	11 (1.8)	34 (4.0)	33 (3.5)	14 (2.4)
Differentiating science instruction to meet the needs of diverse learners	7 (1.2)	15 (2.5)	29 (3.3)	35 (2.5)	14 (1.5)
Incorporating students' cultural backgrounds into science instruction	24 (2.4)	25 (2.4)	24 (2.8)	21 (2.0)	6 (1.2)
Learning how to provide science instruction that integrates engineering, mathematics, and/or computer science	9 (1.6)	13 (1.7)	29 (3.1)	37 (3.4)	12 (2.0)

† Includes only middle school science teachers indicating in Q30 that they participated in science/engineering-focused professional development in the last three years.

Table STQ 34.3
High School Science Teachers' Perceptions of Topics Emphasized During Professional Development in the Last Three Years

	PERCENT OF TEACHERS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
Deepening your own science content knowledge	11 (1.3)	12 (1.8)	33 (1.9)	25 (1.9)	20 (1.7)
Deepening your understanding of how science is done (e.g., developing scientific questions, developing and using models, engaging in argumentation)	7 (1.0)	9 (1.0)	34 (2.3)	33 (1.9)	18 (1.6)
Deepening your understanding of how engineering is done (e.g., identifying criteria and constraints, designing solutions, optimizing solutions)	29 (2.0)	22 (2.0)	25 (1.9)	17 (1.6)	6 (0.9)
Implementing the science textbook/modules to be used in your classroom	22 (1.8)	24 (1.8)	26 (2.0)	20 (1.6)	9 (1.0)
Learning about difficulties that students may have with particular science ideas	11 (1.2)	16 (1.7)	33 (2.0)	29 (1.9)	11 (1.3)
Finding out what students think or already know prior to instruction on a topic	11 (1.5)	18 (1.4)	34 (1.6)	28 (1.7)	9 (1.0)
Monitoring student understanding during science instruction	9 (1.1)	13 (1.9)	30 (1.8)	31 (1.8)	16 (1.5)
Differentiating science instruction to meet the needs of diverse learners	9 (0.9)	14 (1.6)	31 (2.0)	32 (2.0)	14 (1.4)
Incorporating students' cultural backgrounds into science instruction	25 (2.1)	24 (1.8)	28 (2.4)	15 (1.7)	8 (1.4)
Learning how to provide science instruction that integrates engineering, mathematics, and/or computer science	16 (1.5)	19 (1.5)	32 (1.8)	24 (2.0)	9 (1.1)

† Includes only high school science teachers indicating in Q30 that they participated in science/engineering-focused professional development in the last three years.

Table STQ 35
Elementary School Science Teachers' Perceptions of Their Preparedness to Teach Various Subjects

	PERCENT OF TEACHERS			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
Life Science	3 (0.7)	24 (1.8)	49 (1.8)	24 (1.5)
Earth/Space Science	6 (0.8)	27 (1.5)	47 (1.7)	20 (1.5)
Physical Science	11 (1.3)	35 (1.6)	41 (2.1)	13 (1.1)
Engineering	51 (2.2)	33 (1.8)	14 (1.2)	3 (0.6)
Mathematics†	0 (0.1)	4 (0.7)	23 (1.6)	73 (1.6)
Reading/Language Arts†	0 (0.2)	3 (0.6)	17 (1.4)	80 (1.6)
Social Studies†	3 (0.5)	13 (1.4)	43 (1.9)	41 (1.9)
Computer Science/Programming†	43 (2.1)	35 (2.1)	16 (1.5)	6 (1.0)

† This item was presented only to self-contained elementary school teachers.

There is no table for elementary teachers for STQ 36.

Table STQ 36.2
Middle School Science Teachers' Perceptions of Their Preparedness to Teach Various Topics

	PERCENT OF TEACHERS†			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
Earth/Space Science				
Earth's features and physical processes	5 (1.6)	19 (2.3)	34 (2.5)	42 (2.2)
The solar system and the universe	8 (1.8)	25 (2.4)	35 (3.1)	32 (2.0)
Climate and weather	6 (1.1)	23 (2.4)	40 (2.8)	31 (2.3)
Biology/Life Science				
Cell biology	6 (1.7)	18 (2.2)	25 (2.2)	50 (2.6)
Structures and functions of organisms	5 (1.6)	15 (1.9)	25 (2.7)	55 (2.7)
Ecology/ecosystems	3 (0.9)	12 (2.0)	33 (3.0)	52 (3.0)
Genetics	8 (1.9)	17 (2.2)	30 (2.7)	46 (3.0)
Evolution	12 (2.6)	20 (2.1)	27 (2.4)	40 (2.8)
Chemistry				
Atomic structure	9 (2.0)	17 (2.7)	29 (3.0)	46 (3.2)
Chemical bonding, equations, nomenclature, and reactions	15 (2.6)	25 (2.8)	31 (2.8)	28 (2.6)
Elements, compounds, and mixtures	8 (2.2)	15 (2.5)	32 (3.2)	45 (2.6)
The Periodic Table	7 (2.1)	15 (2.5)	31 (3.3)	47 (3.0)
Properties of solutions	8 (2.2)	30 (2.8)	32 (2.9)	30 (2.2)
States, classes, and properties of matter	5 (2.0)	13 (2.2)	26 (2.5)	55 (2.6)
Physics				
Forces and motion	4 (1.8)	15 (1.9)	37 (3.2)	44 (3.5)
Energy transfers, transformations, and conservation	5 (1.8)	17 (2.2)	38 (2.9)	39 (3.0)
Properties and behaviors of waves	10 (2.2)	29 (2.8)	40 (3.5)	21 (2.1)
Electricity and magnetism	15 (2.3)	32 (2.6)	35 (3.0)	19 (2.0)
Modern physics (e.g., special relativity)	36 (2.9)	37 (2.6)	20 (2.2)	7 (1.3)
Engineering				
Defining engineering problems	29 (2.1)	35 (2.3)	24 (2.0)	12 (1.6)
Developing possible solutions	28 (2.2)	32 (2.2)	26 (1.9)	14 (1.8)
Optimizing a design solution	32 (2.2)	33 (2.2)	24 (1.9)	10 (1.6)
Environmental and resource issues (e.g., land and water use, energy resources and consumption, sources and impacts of pollution)	3 (0.8)	22 (3.2)	44 (3.4)	31 (2.8)

† Middle school science teachers were shown only those topics related to their randomly selected class, with the exception of engineering which was presented to all teachers.

Table STQ 36.3
High School Science Teachers' Perceptions of Their Preparedness to Teach Various Topics

	PERCENT OF TEACHERS†			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
Earth/Space Science				
Earth's features and physical processes	0 (0.4)	5 (2.4)	30 (7.7)	64 (7.0)
The solar system and the universe	1 (0.5)	10 (5.1)	29 (6.8)	60 (7.0)
Climate and weather	1 (0.7)	6 (2.5)	33 (7.8)	60 (7.0)
Biology/Life Science				
Cell biology	2 (1.2)	5 (1.6)	19 (1.8)	74 (2.6)
Structures and functions of organisms	2 (1.3)	4 (1.0)	24 (2.6)	70 (3.3)
Ecology/ecosystems	2 (1.1)	8 (1.3)	26 (2.9)	65 (2.5)
Genetics	1 (1.0)	6 (1.4)	23 (2.5)	70 (3.2)
Evolution	2 (1.3)	9 (1.3)	27 (3.1)	63 (2.5)
Chemistry				
Atomic structure	0 ---‡	3 (2.0)	9 (2.3)	87 (2.9)
Chemical bonding, equations, nomenclature, and reactions	1 (0.6)	6 (2.8)	11 (2.3)	83 (3.3)
Elements, compounds, and mixtures	0 ---‡	5 (2.8)	8 (1.6)	87 (3.0)
The Periodic Table	1 (0.9)	2 (1.8)	7 (1.7)	89 (2.4)
Properties of solutions	2 (1.8)	7 (1.9)	15 (1.8)	76 (3.1)
States, classes, and properties of matter	0 ---‡	3 (1.8)	9 (1.6)	88 (2.4)
Physics				
Forces and motion	0 (0.2)	3 (2.6)	18 (3.8)	79 (4.2)
Energy transfers, transformations, and conservation	3 (2.5)	6 (2.7)	20 (3.8)	72 (4.6)
Properties and behaviors of waves	6 (3.7)	10 (2.9)	27 (3.4)	57 (4.8)
Electricity and magnetism	1 (0.4)	17 (3.7)	37 (4.9)	45 (4.4)
Modern physics (e.g., special relativity)	17 (3.9)	26 (2.9)	38 (3.8)	19 (2.7)
Engineering				
Defining engineering problems	38 (1.8)	38 (1.7)	18 (1.2)	7 (0.7)
Developing possible solutions	34 (1.9)	36 (1.9)	22 (1.4)	8 (0.8)
Optimizing a design solution	42 (1.8)	36 (1.7)	16 (1.1)	6 (0.7)
Environmental and resource issues (e.g., land and water use, energy resources and consumption, sources and impacts of pollution)	1 (1.1)	6 (4.6)	29 (5.9)	63 (6.7)

† High school science teachers were shown only those topics related to their randomly selected class, with the exception of engineering which was presented to all teachers.

‡ No high school science teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table STQ 37.1
Elementary School Science Teachers' Perceptions of Their Preparedness for Each of a Number of Tasks

	PERCENT OF TEACHERS			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
Develop students' conceptual understanding of the science ideas you teach	3 (0.6)	23 (1.6)	52 (2.1)	23 (1.5)
Develop students' abilities to do science (e.g., develop scientific questions; design and conduct investigations; analyze data; develop models, explanations, and scientific arguments)	6 (0.8)	31 (1.7)	46 (1.9)	17 (1.5)
Develop students' awareness of STEM careers	21 (1.4)	39 (1.8)	31 (1.7)	9 (0.9)
Provide science instruction that is based on students' ideas (whether completely correct or not) about the topics you teach	13 (1.2)	35 (1.7)	40 (1.6)	12 (1.1)
Use formative assessment to monitor student learning	4 (0.6)	25 (2.0)	43 (2.2)	28 (1.7)
Differentiate science instruction to meet the needs of diverse learners	12 (1.2)	32 (1.6)	37 (1.6)	19 (1.3)
Incorporate students' cultural backgrounds into science instruction	19 (1.3)	39 (1.3)	31 (1.7)	11 (1.1)
Encourage students' interest in science and/or engineering	6 (1.0)	25 (1.6)	43 (1.7)	26 (1.3)
Encourage participation of all students in science and/or engineering	4 (0.8)	21 (1.4)	44 (1.6)	31 (1.6)

Table STQ 37.2
Middle School Science Teachers' Perceptions of Their Preparedness for Each of a Number of Tasks

	PERCENT OF TEACHERS			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
Develop students' conceptual understanding of the science ideas you teach	1 (0.4)	11 (1.9)	47 (2.2)	42 (2.2)
Develop students' abilities to do science (e.g., develop scientific questions; design and conduct investigations; analyze data; develop models, explanations, and scientific arguments)	2 (0.7)	17 (2.2)	43 (2.3)	38 (1.9)
Develop students' awareness of STEM careers	8 (1.2)	38 (2.5)	33 (2.1)	21 (1.8)
Provide science instruction that is based on students' ideas (whether completely correct or not) about the topics you teach	7 (1.4)	28 (2.6)	44 (2.6)	21 (1.8)
Use formative assessment to monitor student learning	1 (0.3)	10 (1.9)	41 (2.5)	48 (2.2)
Differentiate science instruction to meet the needs of diverse learners	3 (0.6)	24 (2.1)	40 (2.0)	33 (2.0)
Incorporate students' cultural backgrounds into science instruction	16 (1.9)	32 (2.1)	37 (2.2)	15 (1.3)
Encourage students' interest in science and/or engineering	1 (0.3)	15 (1.7)	42 (2.4)	42 (2.2)
Encourage participation of all students in science and/or engineering	1 (0.4)	13 (1.7)	42 (2.3)	44 (2.3)

Table STQ 37.3
High School Science Teachers' Perceptions of Their Preparedness for Each of a Number of Tasks

	PERCENT OF TEACHERS			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
Develop students' conceptual understanding of the science ideas you teach	0 (0.1)	5 (0.6)	37 (1.5)	58 (1.5)
Develop students' abilities to do science (e.g., develop scientific questions; design and conduct investigations; analyze data; develop models, explanations, and scientific arguments)	0 (0.3)	12 (1.4)	42 (1.5)	46 (1.6)
Develop students' awareness of STEM careers	7 (0.8)	29 (1.7)	43 (2.0)	21 (1.2)
Provide science instruction that is based on students' ideas (whether completely correct or not) about the topics you teach	5 (0.8)	24 (1.3)	46 (1.8)	25 (1.4)
Use formative assessment to monitor student learning	1 (0.4)	9 (1.2)	38 (1.7)	52 (1.6)
Differentiate science instruction to meet the needs of diverse learners	3 (0.7)	22 (1.4)	40 (1.7)	35 (1.5)
Incorporate students' cultural backgrounds into science instruction	14 (1.3)	34 (1.6)	34 (1.8)	18 (1.4)
Encourage students' interest in science and/or engineering	1 (0.4)	13 (1.3)	42 (1.7)	44 (1.6)
Encourage participation of all students in science and/or engineering	1 (0.3)	16 (1.3)	40 (1.6)	43 (1.6)

Table STQ 38.1
Elementary School Science
Teachers' Opinions About Teaching and Learning

	PERCENT OF TEACHERS				
	STRONGLY DISAGREE	DISAGREE	NO OPINION	AGREE	STRONGLY AGREE
Students learn science best in classes with students of similar abilities.	5 (0.9)	51 (2.4)	19 (1.8)	24 (1.8)	2 (0.4)
It is better for science instruction to focus on ideas in depth, even if that means covering fewer topics.	1 (0.4)	12 (1.3)	13 (1.6)	60 (2.4)	15 (1.8)
At the beginning of instruction on a science idea, students should be provided with definitions for new scientific vocabulary that will be used.	2 (0.6)	10 (1.4)	10 (1.4)	46 (2.0)	31 (2.0)
Teachers should explain an idea to students before having them consider evidence that relates to the idea.	4 (0.8)	45 (2.5)	18 (1.8)	25 (1.9)	8 (1.2)
Most class periods should provide opportunities for students to share their thinking and reasoning.	0 (0.2)	1 (0.3)	3 (0.7)	40 (2.4)	56 (2.4)
Hands-on/laboratory activities should be used primarily to reinforce a science idea that the students have already learned.	5 (0.8)	30 (2.4)	9 (1.1)	32 (1.9)	24 (1.8)
Teachers should ask students to support their conclusions about a science concept with evidence.	0 (0.2)	1 (0.3)	4 (1.0)	51 (2.5)	44 (2.4)
Students learn best when instruction is connected to their everyday lives.	0 (0.2)	1 (0.5)	3 (0.7)	40 (2.3)	55 (2.5)
Most class periods should provide opportunities for students to apply scientific ideas to real-world contexts.	0 (0.2)	1 (0.4)	6 (1.1)	51 (2.5)	43 (2.5)
Students should learn science by doing science (e.g., developing scientific questions; designing and conducting investigations; analyzing data; developing models, explanations, and scientific arguments).	0 (0.2)	0 (0.3)	4 (0.9)	36 (2.2)	60 (2.3)

Table STQ 38.2
Middle School Science
Teachers' Opinions About Teaching and Learning

	PERCENT OF TEACHERS				
	STRONGLY DISAGREE	DISAGREE	NO OPINION	AGREE	STRONGLY AGREE
Students learn science best in classes with students of similar abilities.	3 (0.8)	38 (3.5)	11 (1.6)	40 (3.5)	8 (1.5)
It is better for science instruction to focus on ideas in depth, even if that means covering fewer topics.	1 (0.7)	14 (2.4)	10 (1.7)	53 (2.7)	21 (2.4)
At the beginning of instruction on a science idea, students should be provided with definitions for new scientific vocabulary that will be used.	3 (0.8)	14 (1.3)	10 (1.4)	48 (2.7)	24 (2.6)
Teachers should explain an idea to students before having them consider evidence that relates to the idea.	6 (1.1)	43 (3.2)	21 (2.4)	24 (2.5)	6 (1.3)
Most class periods should provide opportunities for students to share their thinking and reasoning.	0 (0.1)	1 (0.7)	7 (1.9)	47 (2.9)	45 (2.9)
Hands-on/laboratory activities should be used primarily to reinforce a science idea that the students have already learned.	4 (0.8)	30 (2.1)	9 (1.8)	31 (2.8)	26 (2.4)
Teachers should ask students to support their conclusions about a science concept with evidence.	0 (0.3)	1 (0.4)	2 (0.7)	33 (2.7)	64 (2.5)
Students learn best when instruction is connected to their everyday lives.	0 (0.2)	1 (0.4)	2 (0.6)	38 (2.6)	59 (2.7)
Most class periods should provide opportunities for students to apply scientific ideas to real-world contexts.	0 ---†	2 (0.6)	8 (1.9)	46 (2.7)	44 (2.9)
Students should learn science by doing science (e.g., developing scientific questions; designing and conducting investigations; analyzing data; developing models, explanations, and scientific arguments).	0 (0.3)	0 (0.2)	6 (1.7)	36 (2.7)	57 (3.1)

† No middle school science teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table STQ 38.3
High School Science
Teachers' Opinions About Teaching and Learning

	PERCENT OF TEACHERS				
	STRONGLY DISAGREE	DISAGREE	NO OPINION	AGREE	STRONGLY AGREE
Students learn science best in classes with students of similar abilities.	1 (0.4)	27 (1.6)	11 (1.3)	45 (2.0)	15 (1.3)
It is better for science instruction to focus on ideas in depth, even if that means covering fewer topics.	2 (1.4)	12 (1.6)	10 (1.2)	55 (2.0)	22 (1.6)
At the beginning of instruction on a science idea, students should be provided with definitions for new scientific vocabulary that will be used.	1 (0.4)	16 (1.4)	16 (2.0)	43 (2.1)	23 (2.0)
Teachers should explain an idea to students before having them consider evidence that relates to the idea.	5 (0.8)	38 (2.2)	20 (1.7)	30 (2.3)	7 (0.8)
Most class periods should provide opportunities for students to share their thinking and reasoning.	0 (0.2)	3 (1.0)	7 (1.0)	53 (2.5)	36 (2.1)
Hands-on/laboratory activities should be used primarily to reinforce a science idea that the students have already learned.	5 (0.9)	31 (2.1)	12 (1.3)	32 (2.0)	20 (1.8)
Teachers should ask students to support their conclusions about a science concept with evidence.	0 (0.1)	0 (0.0)	1 (0.3)	36 (2.0)	63 (2.1)
Students learn best when instruction is connected to their everyday lives.	0 (0.1)	1 (0.3)	3 (0.7)	40 (2.5)	56 (2.4)
Most class periods should provide opportunities for students to apply scientific ideas to real-world contexts.	0 (0.0)	2 (0.4)	8 (1.4)	54 (2.1)	37 (2.1)
Students should learn science by doing science (e.g., developing scientific questions; designing and conducting investigations; analyzing data; developing models, explanations, and scientific arguments).	0 (0.2)	2 (0.9)	4 (0.8)	40 (2.0)	53 (2.0)

Table STQ 39
Science Teachers Having Various Leadership Responsibilities Within the Last Three Years, by Grade Range

	PERCENT OF TEACHERS		
	ELEMENTARY	MIDDLE	HIGH
Served as a lead teacher or department chair in science	14 (1.6)	37 (2.7)	33 (2.0)
Served as a formal mentor or coach for a science teacher	4 (0.7)	21 (2.1)	27 (1.8)
Supervised a student teacher in your classroom	30 (2.2)	22 (2.2)	22 (2.3)
Served on a school or district/diocese-wide science committee (e.g., developing curriculum, developing pacing guides, selecting instructional materials)	22 (1.9)	44 (3.1)	51 (2.0)
Led or co-led a workshop or professional learning community (e.g., teacher study group, lesson study) for other teachers focused on science or science teaching	8 (1.4)	22 (2.3)	28 (1.7)
Taught a science lesson for other teachers in your school to observe	8 (1.1)	37 (2.9)	38 (2.1)
Observed another teacher's science lesson for the purpose of giving him/her feedback	11 (1.6)	44 (3.1)	50 (2.3)

Table STQ 40
Average Minutes Per Week Science Classes Meet

	AVERAGE NUMBER OF MINUTES†
Elementary	208 (15.4)
Middle	246 (4.5)
High	253 (2.7)

† Includes only non-self-contained classes.

Table STQ 41
Average Number of Students in Science Classes

	AVERAGE NUMBER OF STUDENTS
Elementary	22 (0.2)
Middle	23 (0.3)
High	21 (0.3)

Table STQ 42
Race/Ethnicity of Students in Science Classes, by Grade Range

	PERCENT OF STUDENTS		
	ELEMENTARY	MIDDLE	HIGH
American Indian or Alaskan Native	3 (0.8)	1 (0.3)	1 (0.5)
Asian	4 (0.8)	4 (0.5)	6 (0.6)
Black or African American	18 (1.4)	16 (1.3)	13 (1.0)
Hispanic or Latino	20 (1.6)	24 (1.7)	18 (1.3)
Native Hawaiian or Other Pacific Islander	1 (0.2)	0 (0.1)	1 (0.5)
White	50 (1.8)	52 (1.6)	59 (1.4)
Two or more races	5 (0.4)	4 (0.4)	4 (0.6)

Table STQ 43
Prior Science Achievement Level of Students in Science Classes, by Grade Range

	PERCENT OF CLASSES		
	ELEMENTARY	MIDDLE	HIGH
Mostly low achievers	11 (1.3)	17 (1.8)	13 (1.3)
Mostly average achievers	43 (1.8)	26 (1.8)	28 (1.5)
Mostly high achievers	6 (0.9)	15 (1.6)	31 (1.6)
A mixture of levels	41 (1.9)	43 (2.3)	28 (1.5)

Table STQ 44.1
Elementary School Science Classes in Which Teachers Report Having Control Over Various Curricular and Instructional Decisions

	PERCENT OF CLASSES				
	NO CONTROL 1	2	MODERATE CONTROL 3	4	STRONG CONTROL 5
Determining course goals and objectives	27 (2.2)	14 (1.7)	28 (2.2)	13 (1.7)	17 (2.7)
Selecting curriculum materials (e.g., textbooks/modules)	29 (2.3)	16 (1.6)	27 (2.0)	12 (1.3)	15 (2.5)
Selecting content, topics, and skills to be taught	34 (2.6)	19 (1.7)	23 (2.3)	12 (1.3)	13 (2.6)
Selecting the sequence in which topics are covered	18 (2.1)	11 (1.3)	23 (1.9)	18 (1.6)	30 (2.6)
Determining the amount of instructional time to spend on each topic	15 (2.1)	16 (1.6)	28 (2.2)	20 (1.8)	21 (2.7)
Selecting teaching techniques	2 (0.5)	2 (0.7)	19 (2.1)	30 (1.7)	48 (2.3)
Determining the amount of homework to be assigned	4 (0.9)	2 (0.5)	13 (1.7)	22 (1.7)	59 (2.5)
Choosing criteria for grading student performance	5 (0.9)	5 (0.9)	21 (2.1)	28 (1.8)	41 (2.5)

Table STQ 44.2
Middle School Science Classes in Which Teachers Report Having Control Over Various Curricular and Instructional Decisions

	PERCENT OF CLASSES				
	NO CONTROL		MODERATE CONTROL		STRONG CONTROL
	1	2	3	4	5
Determining course goals and objectives	20 (2.0)	10 (1.3)	23 (2.1)	15 (1.5)	33 (3.0)
Selecting curriculum materials (e.g., textbooks/modules)	17 (2.3)	15 (1.8)	22 (2.1)	18 (1.8)	28 (2.9)
Selecting content, topics, and skills to be taught	24 (2.9)	19 (1.9)	18 (1.4)	13 (1.5)	27 (3.0)
Selecting the sequence in which topics are covered	13 (2.0)	13 (1.6)	18 (1.7)	15 (1.5)	41 (2.9)
Determining the amount of instructional time to spend on each topic	6 (1.6)	10 (1.7)	19 (1.8)	22 (1.9)	43 (3.2)
Selecting teaching techniques	0 (0.1)	2 (0.5)	10 (1.8)	22 (2.1)	67 (2.4)
Determining the amount of homework to be assigned	0 (0.2)	1 (0.5)	8 (1.9)	17 (1.6)	73 (2.2)
Choosing criteria for grading student performance	3 (1.3)	3 (0.7)	11 (1.3)	24 (1.9)	59 (2.6)

Table STQ 44.3
High School Science Classes in Which Teachers Report Having Control Over Various Curricular and Instructional Decisions

	PERCENT OF CLASSES				
	NO CONTROL		MODERATE CONTROL		STRONG CONTROL
	1	2	3	4	5
Determining course goals and objectives	12 (1.4)	10 (1.5)	17 (1.6)	24 (2.1)	36 (2.5)
Selecting curriculum materials (e.g., textbooks/modules)	12 (1.7)	13 (1.4)	21 (2.4)	18 (1.7)	36 (2.0)
Selecting content, topics, and skills to be taught	11 (1.3)	13 (1.5)	19 (1.7)	22 (2.0)	34 (2.2)
Selecting the sequence in which topics are covered	6 (1.0)	8 (1.5)	15 (1.2)	20 (1.6)	51 (2.1)
Determining the amount of instructional time to spend on each topic	4 (1.5)	5 (0.8)	17 (1.5)	26 (2.1)	48 (2.1)
Selecting teaching techniques	1 (1.3)	3 (0.8)	7 (1.1)	21 (2.1)	68 (2.3)
Determining the amount of homework to be assigned	1 (0.5)	1 (0.4)	6 (0.9)	19 (1.7)	74 (1.8)
Choosing criteria for grading student performance	2 (0.5)	5 (1.6)	13 (1.4)	25 (1.5)	54 (2.2)

Table STQ 45.1
Emphasis Given in Elementary School Science Classes to Various Instructional Objectives

	PERCENT OF CLASSES			
	NONE	MINIMAL EMPHASIS	MODERATE EMPHASIS	HEAVY EMPHASIS
Learning science vocabulary and/or facts	0 (0.3)	15 (1.5)	58 (1.9)	27 (1.9)
Understanding science concepts	0 (0.1)	7 (0.9)	47 (1.6)	47 (1.7)
Learning about different fields of science/engineering	9 (0.9)	49 (1.9)	34 (2.1)	8 (1.9)
Learning how to do science (develop scientific questions; design and conduct investigations; analyze data; develop models, explanations, and scientific arguments)	2 (0.4)	26 (1.7)	46 (1.8)	26 (2.0)
Learning how to do engineering (e.g., identify criteria and constraints, design solutions, optimize solutions)	22 (1.6)	42 (1.8)	28 (1.8)	8 (1.8)
Learning about real-life applications of science/engineering	6 (0.9)	27 (1.7)	47 (2.1)	20 (2.1)
Increasing students' interest in science/engineering	2 (0.5)	20 (1.7)	50 (2.0)	27 (2.2)
Developing students' confidence that they can successfully pursue careers in science/engineering	6 (0.8)	30 (1.8)	42 (2.3)	23 (2.0)
Learning test-taking skills/strategies	10 (1.2)	32 (1.5)	38 (2.1)	20 (1.5)

Table STQ 45.2
Emphasis Given in Middle School Science Classes to Various Instructional Objectives

	PERCENT OF CLASSES			
	NONE	MINIMAL EMPHASIS	MODERATE EMPHASIS	HEAVY EMPHASIS
Learning science vocabulary and/or facts	0 (0.2)	12 (1.7)	51 (2.3)	37 (2.2)
Understanding science concepts	0 ---†	1 (0.4)	23 (1.7)	77 (1.8)
Learning about different fields of science/engineering	6 (0.8)	51 (2.4)	36 (2.4)	7 (1.2)
Learning how to do science (develop scientific questions; design and conduct investigations; analyze data; develop models, explanations, and scientific arguments)	1 (0.5)	9 (1.2)	45 (2.4)	46 (2.1)
Learning how to do engineering (e.g., identify criteria and constraints, design solutions, optimize solutions)	18 (1.9)	45 (2.1)	27 (2.3)	10 (1.2)
Learning about real-life applications of science/engineering	3 (0.6)	25 (2.3)	44 (1.9)	28 (2.0)
Increasing students' interest in science/engineering	2 (0.5)	18 (2.0)	44 (2.0)	35 (2.1)
Developing students' confidence that they can successfully pursue careers in science/engineering	2 (0.6)	22 (1.8)	46 (2.1)	30 (1.9)
Learning test-taking skills/strategies	4 (1.0)	31 (2.3)	43 (2.3)	23 (1.8)

† No middle school science teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table STQ 45.3
Emphasis Given in High School Science Classes to Various Instructional Objectives

	PERCENT OF CLASSES			
	NONE	MINIMAL EMPHASIS	MODERATE EMPHASIS	HEAVY EMPHASIS
Learning science vocabulary and/or facts	0 (0.1)	16 (1.2)	52 (1.8)	32 (1.6)
Understanding science concepts	0 ---†	0 (0.1)	24 (1.7)	76 (1.8)
Learning about different fields of science/engineering	8 (1.0)	52 (1.6)	33 (1.5)	7 (0.8)
Learning how to do science (develop scientific questions; design and conduct investigations; analyze data; develop models, explanations, and scientific arguments)	1 (0.6)	13 (1.1)	45 (1.4)	41 (1.3)
Learning how to do engineering (e.g., identify criteria and constraints, design solutions, optimize solutions)	31 (1.5)	44 (1.7)	20 (1.3)	5 (0.7)
Learning about real-life applications of science/engineering	2 (0.5)	23 (1.6)	47 (1.6)	29 (1.2)
Increasing students' interest in science/engineering	1 (0.3)	17 (1.4)	51 (1.7)	31 (1.5)
Developing students' confidence that they can successfully pursue careers in science/engineering	1 (0.3)	18 (1.3)	45 (1.8)	35 (1.5)
Learning test-taking skills/strategies	4 (0.6)	30 (1.7)	43 (1.8)	23 (1.4)

† No high school science teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table STQ 46.1
Elementary School Science Classes in Which Teachers Report Using Various Activities in Their Classrooms

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL SCIENCE LESSONS
Explain science ideas to the whole class	0 (0.1)	1 (0.4)	13 (1.8)	37 (2.1)	48 (1.8)
Engage the whole class in discussions	0 (0.1)	1 (0.4)	8 (0.9)	35 (1.5)	55 (1.5)
Have students work in small groups	0 (0.1)	5 (0.8)	20 (1.5)	44 (1.7)	30 (2.0)
Have students do hands-on/laboratory activities	1 (0.4)	11 (1.2)	35 (1.8)	37 (1.9)	16 (1.9)
Use flipped instruction (have students watch lectures/demonstrations outside of class to prepare for in-class activities)	53 (2.1)	22 (1.7)	15 (1.8)	7 (1.0)	3 (0.5)
Have students read from a textbook, module, or other material in class, either aloud or to themselves	15 (1.3)	21 (2.1)	28 (1.7)	26 (1.6)	11 (1.4)
Engage the class in project-based learning (PBL) activities	11 (1.3)	23 (1.5)	37 (2.1)	21 (1.6)	8 (2.0)
Have students write their reflections (e.g., in their journals, on exit tickets) in class or for homework	8 (1.0)	19 (1.5)	29 (1.4)	30 (1.9)	14 (1.3)
Focus on literacy skills (e.g., informational reading or writing strategies)	4 (0.7)	10 (1.0)	26 (1.9)	40 (1.7)	20 (1.5)
Have students practice for standardized tests	37 (2.0)	24 (2.1)	21 (1.7)	13 (1.2)	5 (0.9)

Table STQ 46.2
Middle School Science Classes in Which Teachers Report Using Various Activities in Their Classrooms

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL SCIENCE LESSONS
Explain science ideas to the whole class	0 (0.1)	1 (0.4)	6 (0.8)	46 (2.0)	46 (2.1)
Engage the whole class in discussions	0 (0.1)	1 (0.4)	10 (1.1)	47 (2.1)	42 (2.1)
Have students work in small groups	0 ---†	2 (0.7)	11 (1.4)	53 (2.2)	33 (2.1)
Have students do hands-on/laboratory activities	0 (0.3)	5 (1.6)	31 (2.0)	52 (2.1)	11 (1.4)
Use flipped instruction (have students watch lectures/demonstrations outside of class to prepare for in-class activities)	43 (2.3)	31 (2.1)	17 (1.7)	7 (1.0)	2 (0.5)
Have students read from a textbook, module, or other material in class, either aloud or to themselves	3 (0.7)	22 (2.1)	36 (2.0)	31 (2.0)	8 (1.7)
Engage the class in project-based learning (PBL) activities	7 (1.6)	22 (1.6)	40 (2.1)	23 (1.8)	8 (1.4)
Have students write their reflections (e.g., in their journals, on exit tickets) in class or for homework	6 (1.3)	16 (1.6)	31 (1.6)	30 (1.6)	17 (1.9)
Focus on literacy skills (e.g., informational reading or writing strategies)	3 (0.8)	13 (1.5)	38 (1.9)	35 (2.1)	11 (1.4)
Have students practice for standardized tests	19 (1.7)	35 (2.5)	26 (1.8)	14 (1.5)	4 (0.8)

† No middle school science teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table STQ 46.3
High School Science Classes in Which Teachers Report Using Various Activities in Their Classrooms

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL SCIENCE LESSONS
Explain science ideas to the whole class	0 (0.0)	2 (0.4)	7 (0.9)	49 (1.7)	42 (1.7)
Engage the whole class in discussions	0 (0.1)	3 (0.4)	19 (1.3)	47 (1.6)	31 (1.6)
Have students work in small groups	0 (0.1)	2 (0.5)	13 (1.4)	54 (1.6)	30 (1.5)
Have students do hands-on/laboratory activities	1 (0.3)	4 (0.7)	27 (1.4)	57 (1.8)	12 (1.0)
Use flipped instruction (have students watch lectures/demonstrations outside of class to prepare for in-class activities)	31 (1.5)	33 (1.7)	21 (1.4)	11 (1.2)	4 (0.7)
Have students read from a textbook, module, or other material in class, either aloud or to themselves	13 (1.2)	29 (1.4)	32 (1.6)	22 (1.7)	4 (0.7)
Engage the class in project-based learning (PBL) activities	9 (0.8)	25 (1.4)	38 (1.7)	22 (1.6)	6 (0.7)
Have students write their reflections (e.g., in their journals, on exit tickets) in class or for homework	17 (1.5)	26 (1.5)	29 (1.6)	20 (1.5)	8 (0.9)
Focus on literacy skills (e.g., informational reading or writing strategies)	9 (1.2)	23 (1.4)	36 (1.8)	26 (1.6)	6 (0.9)
Have students practice for standardized tests	25 (1.5)	29 (1.7)	26 (1.4)	16 (1.1)	5 (0.8)

Table STQ 47.1
Elementary School Science Classes in Which Teachers Report Students Engaging in Various Aspects of Science Practices

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL SCIENCE LESSONS
Determine whether or not a question is "scientific" (meaning it requires an answer supported by evidence gathered through systematic investigation)	20 (1.4)	31 (2.1)	31 (2.2)	15 (1.4)	4 (0.7)
Generate scientific questions based on their curiosity, prior knowledge, careful observation of real-world phenomena, scientific models, or preliminary data from an investigation	6 (0.8)	21 (1.5)	36 (1.8)	29 (1.7)	9 (1.9)
Determine what data would need to be collected in order to answer a scientific question (regardless of who generated the question)	8 (0.9)	25 (1.8)	37 (2.1)	24 (2.0)	5 (0.7)
Develop procedures for a scientific investigation to answer a scientific question (regardless of who generated the question)	9 (1.0)	26 (1.8)	35 (2.0)	25 (1.9)	4 (0.7)
Conduct a scientific investigation (regardless of who developed the procedures)	4 (0.6)	20 (1.7)	40 (1.7)	29 (2.0)	7 (1.3)
Organize and/or represent data using tables, charts, or graphs in order to facilitate analysis of the data	6 (0.7)	21 (1.5)	40 (1.9)	27 (1.9)	7 (1.2)
Compare data from multiple trials or across student groups for consistency in order to identify potential sources of error or inconsistencies in the data	22 (1.4)	33 (2.0)	27 (1.7)	15 (2.0)	4 (0.9)
Analyze data using grade-appropriate methods in order to identify patterns, trends, or relationships	12 (1.1)	27 (1.8)	34 (1.7)	21 (1.9)	6 (1.0)
Consider how missing data or measurement error can affect the interpretation of data	24 (1.5)	32 (1.8)	30 (2.1)	11 (1.4)	3 (0.6)
Make and support claims (proposed answers to scientific questions) with evidence	10 (1.1)	21 (1.5)	37 (1.9)	23 (1.4)	9 (1.8)
Use multiple sources of evidence (e.g., different investigations, scientific literature) to develop an explanation	15 (1.2)	27 (1.8)	31 (1.7)	20 (2.1)	6 (0.9)
Revise their explanations (claims supported by evidence and reasoning) for real-world phenomena based on additional evidence	17 (1.2)	27 (1.5)	34 (1.8)	17 (1.8)	5 (0.8)
Develop scientific models—physical, graphical, or mathematical representations of real-world phenomena—based on data and reasoning	19 (1.1)	33 (1.6)	29 (1.6)	16 (1.7)	3 (0.7)
Identify the strengths and limitations of a scientific model—in terms of accuracy, clarity, generalizability, accessibility to others, strength of evidence supporting it—regardless of who created the model	31 (1.4)	34 (1.7)	24 (1.6)	10 (1.9)	2 (0.5)

Select and use grade-appropriate mathematical and/or statistical techniques to analyze data (e.g., determining the best measure of central tendency, examining variation in data, or developing a fit line)	27 (1.5)	29 (2.1)	29 (2.2)	12 (1.2)	3 (0.7)
Use mathematical and/or computational models to generate data to support a scientific claim	28 (1.6)	33 (1.9)	28 (2.1)	9 (1.1)	2 (0.6)
Determine what details about an investigation (e.g., its design, implementation, and results) might persuade a targeted audience about a scientific claim (regardless of who made the claim)	33 (1.7)	32 (2.2)	24 (1.8)	8 (1.1)	2 (0.6)
Use data and reasoning to defend, verbally or in writing, a claim or refute alternative scientific claims about a real-world phenomenon (regardless of who made the claims)	27 (1.5)	31 (1.7)	25 (2.1)	14 (1.6)	2 (0.6)
Evaluate the strengths and weaknesses of competing scientific explanations (claims supported by evidence) for a real-world phenomenon	33 (1.4)	29 (1.9)	26 (1.9)	9 (1.3)	2 (0.5)
Construct a persuasive case, verbally or in writing, for the best scientific model or explanation for a real-world phenomenon	35 (1.6)	33 (1.7)	23 (1.8)	8 (1.1)	1 (0.4)
Pose questions that elicit relevant details about the important aspects of a scientific argument (e.g., the claims/models/explanations, research design, implementation, data analysis)	31 (1.4)	29 (1.8)	27 (1.8)	11 (1.3)	3 (0.7)
Evaluate the credibility of scientific information—e.g., its reliability, validity, consistency, logical coherence, lack of bias, or methodological strengths and weaknesses (regardless of whether it is from their own or others' work)	38 (1.6)	30 (2.0)	23 (2.3)	7 (1.0)	2 (0.5)
Summarize patterns, similarities, and differences in scientific information obtained from multiple sources (regardless of whether it is from their own or others' work)	24 (1.2)	32 (1.6)	26 (1.5)	15 (2.0)	3 (0.6)

Table STQ 47.2
Middle School Science Classes in Which Teachers Report Students Engaging in Various Aspects of Science Practices

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL SCIENCE LESSONS
Determine whether or not a question is "scientific" (meaning it requires an answer supported by evidence gathered through systematic investigation)	5 (0.8)	24 (2.1)	40 (2.0)	24 (1.8)	7 (1.1)
Generate scientific questions based on their curiosity, prior knowledge, careful observation of real-world phenomena, scientific models, or preliminary data from an investigation	2 (0.4)	16 (1.8)	39 (2.1)	33 (2.3)	10 (1.3)
Determine what data would need to be collected in order to answer a scientific question (regardless of who generated the question)	2 (0.5)	18 (2.0)	42 (1.9)	31 (2.0)	8 (1.2)
Develop procedures for a scientific investigation to answer a scientific question (regardless of who generated the question)	3 (0.6)	21 (1.5)	41 (1.8)	27 (1.9)	7 (1.2)
Conduct a scientific investigation (regardless of who developed the procedures)	2 (0.6)	11 (1.5)	40 (1.9)	40 (1.9)	8 (1.3)
Organize and/or represent data using tables, charts, or graphs in order to facilitate analysis of the data	1 (0.3)	8 (1.5)	42 (2.3)	39 (2.1)	10 (1.3)
Compare data from multiple trials or across student groups for consistency in order to identify potential sources of error or inconsistencies in the data	4 (0.8)	22 (2.1)	43 (2.2)	27 (2.1)	5 (0.9)
Analyze data using grade-appropriate methods in order to identify patterns, trends, or relationships	3 (1.0)	16 (2.0)	37 (2.2)	34 (2.2)	10 (1.4)
Consider how missing data or measurement error can affect the interpretation of data	4 (1.0)	28 (2.1)	46 (2.0)	19 (2.0)	2 (0.5)
Make and support claims (proposed answers to scientific questions) with evidence	1 (0.3)	10 (1.3)	39 (2.0)	41 (1.9)	9 (1.3)
Use multiple sources of evidence (e.g., different investigations, scientific literature) to develop an explanation	3 (0.6)	18 (1.7)	41 (2.2)	30 (1.9)	7 (1.3)
Revise their explanations (claims supported by evidence and reasoning) for real-world phenomena based on additional evidence	4 (0.7)	22 (2.3)	44 (2.3)	24 (1.9)	5 (0.8)
Develop scientific models—physical, graphical, or mathematical representations of real-world phenomena—based on data and reasoning	3 (0.6)	23 (2.5)	41 (2.1)	29 (2.3)	5 (0.7)
Identify the strengths and limitations of a scientific model—in terms of accuracy, clarity, generalizability, accessibility to others, strength of evidence supporting it—regardless of who created the model	8 (1.3)	30 (1.9)	41 (2.3)	18 (1.9)	4 (0.6)

Select and use grade-appropriate mathematical and/or statistical techniques to analyze data (e.g., determining the best measure of central tendency, examining variation in data, or developing a fit line)	12 (1.6)	30 (2.3)	38 (2.1)	17 (1.8)	4 (0.8)
Use mathematical and/or computational models to generate data to support a scientific claim	10 (1.5)	30 (1.9)	41 (2.2)	16 (1.3)	3 (0.6)
Determine what details about an investigation (e.g., its design, implementation, and results) might persuade a targeted audience about a scientific claim (regardless of who made the claim)	15 (1.8)	34 (1.7)	35 (2.1)	12 (1.3)	3 (0.7)
Use data and reasoning to defend, verbally or in writing, a claim or refute alternative scientific claims about a real-world phenomenon (regardless of who made the claims)	8 (1.6)	21 (1.7)	43 (2.0)	24 (1.6)	5 (0.9)
Evaluate the strengths and weaknesses of competing scientific explanations (claims supported by evidence) for a real-world phenomenon	10 (1.5)	32 (2.0)	39 (1.9)	16 (1.4)	4 (0.9)
Construct a persuasive case, verbally or in writing, for the best scientific model or explanation for a real-world phenomenon	16 (1.7)	36 (1.8)	30 (1.8)	14 (1.5)	3 (0.7)
Pose questions that elicit relevant details about the important aspects of a scientific argument (e.g., the claims/models/explanations, research design, implementation, data analysis)	12 (1.5)	28 (1.8)	35 (2.2)	19 (1.8)	5 (0.8)
Evaluate the credibility of scientific information—e.g., its reliability, validity, consistency, logical coherence, lack of bias, or methodological strengths and weaknesses (regardless of whether it is from their own or others' work)	13 (1.5)	32 (1.8)	37 (2.1)	15 (1.5)	4 (0.7)
Summarize patterns, similarities, and differences in scientific information obtained from multiple sources (regardless of whether it is from their own or others' work)	9 (1.5)	24 (1.8)	41 (2.2)	20 (1.7)	5 (0.8)

Table STQ 47.3
High School Science Classes in Which Teachers Report Students Engaging in Various Aspects of Science Practices

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL SCIENCE LESSONS
Determine whether or not a question is "scientific" (meaning it requires an answer supported by evidence gathered through systematic investigation)	8 (0.7)	28 (1.5)	36 (1.5)	23 (1.3)	6 (0.7)
Generate scientific questions based on their curiosity, prior knowledge, careful observation of real-world phenomena, scientific models, or preliminary data from an investigation	3 (0.5)	18 (1.3)	41 (2.0)	30 (1.6)	8 (1.0)
Determine what data would need to be collected in order to answer a scientific question (regardless of who generated the question)	3 (0.5)	16 (1.1)	42 (1.6)	32 (1.4)	8 (0.9)
Develop procedures for a scientific investigation to answer a scientific question (regardless of who generated the question)	4 (0.8)	20 (1.2)	44 (1.5)	26 (1.4)	6 (0.8)
Conduct a scientific investigation (regardless of who developed the procedures)	2 (0.4)	12 (1.3)	36 (1.7)	43 (1.4)	8 (0.8)
Organize and/or represent data using tables, charts, or graphs in order to facilitate analysis of the data	1 (0.3)	8 (1.0)	33 (1.6)	48 (1.6)	10 (0.9)
Compare data from multiple trials or across student groups for consistency in order to identify potential sources of error or inconsistencies in the data	4 (0.6)	19 (1.3)	41 (1.6)	31 (1.4)	5 (0.7)
Analyze data using grade-appropriate methods in order to identify patterns, trends, or relationships	3 (0.6)	12 (1.1)	38 (1.7)	40 (1.5)	7 (0.8)
Consider how missing data or measurement error can affect the interpretation of data	4 (0.7)	25 (1.6)	43 (1.9)	24 (1.4)	3 (0.5)
Make and support claims (proposed answers to scientific questions) with evidence	2 (0.5)	9 (0.9)	39 (1.7)	41 (1.8)	9 (0.9)
Use multiple sources of evidence (e.g., different investigations, scientific literature) to develop an explanation	5 (0.6)	22 (1.3)	40 (1.6)	27 (1.5)	6 (0.8)
Revise their explanations (claims supported by evidence and reasoning) for real-world phenomena based on additional evidence	5 (0.8)	22 (1.3)	44 (1.9)	23 (1.2)	5 (0.7)
Develop scientific models—physical, graphical, or mathematical representations of real-world phenomena—based on data and reasoning	5 (0.7)	20 (1.2)	41 (1.8)	28 (1.5)	6 (0.7)
Identify the strengths and limitations of a scientific model—in terms of accuracy, clarity, generalizability, accessibility to others, strength of evidence supporting it—regardless of who created the model	6 (0.9)	30 (1.4)	42 (1.5)	18 (1.1)	3 (0.7)

Select and use grade-appropriate mathematical and/or statistical techniques to analyze data (e.g., determining the best measure of central tendency, examining variation in data, or developing a fit line)	8 (0.9)	26 (1.4)	36 (1.8)	24 (1.5)	6 (0.7)
Use mathematical and/or computational models to generate data to support a scientific claim	9 (1.0)	26 (1.6)	38 (2.0)	21 (1.3)	5 (0.6)
Determine what details about an investigation (e.g., its design, implementation, and results) might persuade a targeted audience about a scientific claim (regardless of who made the claim)	16 (1.3)	33 (1.4)	34 (1.7)	14 (1.2)	2 (0.5)
Use data and reasoning to defend, verbally or in writing, a claim or refute alternative scientific claims about a real-world phenomenon (regardless of who made the claims)	9 (0.8)	25 (1.2)	39 (1.7)	22 (1.7)	5 (0.7)
Evaluate the strengths and weaknesses of competing scientific explanations (claims supported by evidence) for a real-world phenomenon	11 (1.2)	33 (1.5)	35 (1.7)	17 (1.4)	3 (0.6)
Construct a persuasive case, verbally or in writing, for the best scientific model or explanation for a real-world phenomenon	17 (1.4)	36 (1.7)	31 (1.5)	13 (0.9)	2 (0.6)
Pose questions that elicit relevant details about the important aspects of a scientific argument (e.g., the claims/models/explanations, research design, implementation, data analysis)	13 (1.3)	31 (1.5)	34 (1.7)	18 (1.2)	5 (1.0)
Evaluate the credibility of scientific information—e.g., its reliability, validity, consistency, logical coherence, lack of bias, or methodological strengths and weaknesses (regardless of whether it is from their own or others' work)	11 (0.9)	33 (1.5)	33 (1.6)	19 (1.3)	4 (0.8)
Summarize patterns, similarities, and differences in scientific information obtained from multiple sources (regardless of whether it is from their own or others' work)	10 (1.1)	24 (1.5)	38 (1.6)	22 (1.3)	6 (1.0)

Table STQ 48
Science Classes in Which Teachers Report Incorporating Engineering Into Science Instruction, by Grade Range

	PERCENT OF CLASSES		
	ELEMENTARY	MIDDLE	HIGH
Never	16 (1.8)	10 (1.8)	20 (1.8)
Rarely (e.g., a few times per year)	48 (2.5)	51 (2.4)	50 (1.9)
Sometimes (e.g., once or twice a month)	26 (2.2)	32 (2.2)	24 (1.5)
Often (e.g., once or twice a week)	8 (2.7)	5 (1.0)	6 (1.1)
All or almost all science lessons	1 (0.5)	1 (0.6)	1 (0.2)

Table STQ 49
Science Classes in Which Teachers Report Incorporating Coding Into Science Instruction, by Grade Range

	PERCENT OF CLASSES		
	ELEMENTARY	MIDDLE	HIGH
Never	71 (3.4)	81 (1.9)	89 (1.2)
Rarely (e.g., a few times per year)	16 (2.0)	14 (1.8)	6 (0.9)
Sometimes (e.g., once or twice a month)	11 (2.8)	3 (0.8)	4 (0.8)
Often (e.g., once or twice a week)	3 (0.7)	1 (0.5)	0 (0.1)
All or almost all science lessons	0 ---†	0 (0.3)	0 (0.0)

† No elementary school science teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table STQ 50
Amount of Homework Assigned in Science Classes Per Week, by Grade Range

	PERCENT OF CLASSES		
	ELEMENTARY	MIDDLE	HIGH
None	57 (2.8)	8 (1.8)	3 (0.5)
1–15 minutes per week	21 (2.2)	15 (1.9)	9 (1.3)
16–30 minutes per week	12 (1.4)	33 (2.8)	19 (1.3)
31–60 minutes per week	8 (2.6)	31 (2.7)	33 (1.6)
61–90 minutes per week	2 (1.1)	8 (1.4)	22 (1.9)
91–120 minutes per week	0 (0.1)	3 (1.0)	7 (0.9)
More than 2 hours per week	0 ---†	2 (1.2)	7 (0.9)

† No elementary school science teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table STQ 51
Frequency of Required External Science Testing in Science Classes, by Grade Range

	PERCENT OF CLASSES		
	ELEMENTARY	MIDDLE	HIGH
Never	62 (2.4)	17 (1.8)	31 (2.0)
Once a year	17 (2.6)	33 (2.7)	33 (2.0)
Twice a year	4 (0.8)	11 (1.8)	14 (1.7)
Three or four times a year	11 (1.5)	28 (2.8)	16 (1.5)
Five or more times a year	6 (1.1)	11 (1.9)	6 (0.9)

Table STQ 52.1
Availability of Resources in Elementary School Science Classes

	PERCENT OF CLASSES		
	NOT AVAILABLE	AVAILABLE IN ANOTHER ROOM	LOCATED IN YOUR CLASSROOM
Lab tables	71 (3.1)	19 (2.4)	9 (2.5)
Electric outlets	7 (1.1)	3 (0.8)	90 (1.4)
Faucets and sinks	17 (2.0)	21 (2.6)	61 (3.0)

Table STQ 52.2
Availability of Resources in Middle School Science Classes

	PERCENT OF CLASSES		
	NOT AVAILABLE	AVAILABLE IN ANOTHER ROOM	LOCATED IN YOUR CLASSROOM
Lab tables	19 (2.0)	13 (2.0)	68 (2.6)
Electric outlets	2 (0.7)	5 (1.3)	93 (1.6)
Faucets and sinks	11 (1.5)	14 (2.0)	76 (2.3)

Table STQ 52.3
Availability of Resources in High School Science Classes

	PERCENT OF CLASSES		
	NOT AVAILABLE	AVAILABLE IN ANOTHER ROOM	LOCATED IN YOUR CLASSROOM
Lab tables	6 (1.1)	14 (1.7)	80 (1.7)
Electric outlets	2 (0.6)	3 (0.7)	95 (0.8)
Faucets and sinks	5 (0.9)	14 (1.6)	81 (1.9)
Gas for burners	15 (1.7)	26 (1.8)	60 (2.5)
Fume hoods	18 (1.8)	44 (2.2)	38 (2.2)

Table STQ 53.1
Availability of Instructional Technology in Elementary School Science Classes

	PERCENT OF CLASSES		
	NOT AVAILABLE	AVAILABLE UPON REQUEST	ALWAYS AVAILABLE IN YOUR CLASSROOM
Probes for collecting data (e.g., motion sensors, temperature probes)	61 (2.7)	32 (2.3)	8 (2.7)
Microscopes	44 (2.7)	45 (2.8)	11 (2.0)
Balances (e.g., pan, triple beam, digital scale)	20 (2.0)	44 (2.1)	36 (2.7)
Projection devices (e.g., Smartboard, document camera, LCD projector)	2 (0.7)	3 (0.7)	95 (0.9)

Table STQ 53.2
Availability of Instructional Technology in Middle School Science Classes

	PERCENT OF CLASSES		
	NOT AVAILABLE	AVAILABLE UPON REQUEST	ALWAYS AVAILABLE IN YOUR CLASSROOM
Probes for collecting data (e.g., motion sensors, temperature probes)	32 (2.4)	42 (2.8)	26 (3.0)
Microscopes	7 (1.3)	48 (2.5)	45 (2.7)
Balances (e.g., pan, triple beam, digital scale)	4 (1.0)	39 (2.5)	57 (2.7)
Projection devices (e.g., Smartboard, document camera, LCD projector)	1 (1.1)	5 (1.2)	94 (1.6)

Table STQ 53.3
Availability of Instructional Technology in High School Science Classes

	PERCENT OF CLASSES		
	NOT AVAILABLE	AVAILABLE UPON REQUEST	ALWAYS AVAILABLE IN YOUR CLASSROOM
Probes for collecting data (e.g., motion sensors, temperature probes)	19 (2.3)	48 (2.2)	33 (1.8)
Microscopes	6 (1.0)	51 (2.5)	43 (2.2)
Balances (e.g., pan, triple beam, digital scale)	3 (0.8)	29 (2.0)	68 (2.2)
Projection devices (e.g., Smartboard, document camera, LCD projector)	2 (0.9)	3 (0.8)	95 (1.1)

Table STQ 54.1
Adequacy of Classroom Resources for Science Instruction in Elementary Schools

	PERCENT OF CLASSES				
	NOT ADEQUATE 1	2	SOMEWHAT ADEQUATE 3	4	ADEQUATE 5
Instructional technology (e.g., calculators, computers, probes/sensors)	12 (1.6)	9 (1.2)	30 (2.3)	17 (1.7)	32 (2.5)
Consumable supplies (e.g., chemicals, living organisms, batteries)	30 (2.3)	16 (1.6)	24 (1.9)	16 (2.0)	14 (2.8)
Equipment (e.g., thermometers, magnifying glasses, microscopes, beakers, photogate timers, Bunsen burners)	19 (2.0)	15 (1.5)	27 (2.0)	16 (1.7)	23 (2.6)
Facilities (e.g., lab tables, electric outlets, faucets and sinks)	20 (1.9)	13 (1.4)	28 (2.5)	18 (2.1)	21 (2.7)

Table STQ 54.2
Adequacy of Classroom Resources
for Science Instruction in Middle Schools

	PERCENT OF CLASSES				
	NOT ADEQUATE 1	2	SOMEWHAT ADEQUATE 3	4	ADEQUATE 5
Instructional technology (e.g., calculators, computers, probes/sensors)	9 (2.1)	8 (1.3)	26 (2.2)	21 (2.0)	37 (2.5)
Consumable supplies (e.g., chemicals, living organisms, batteries)	16 (2.1)	11 (1.7)	28 (2.6)	18 (1.8)	27 (2.1)
Equipment (e.g., thermometers, magnifying glasses, microscopes, beakers, photogate timers, Bunsen burners)	9 (1.6)	9 (1.6)	24 (2.2)	24 (2.3)	34 (2.5)
Facilities (e.g., lab tables, electric outlets, faucets and sinks)	12 (1.6)	7 (1.1)	20 (2.6)	17 (2.0)	45 (2.5)

Table STQ 54.3
Adequacy of Classroom Resources
for Science Instruction in High Schools

	PERCENT OF CLASSES				
	NOT ADEQUATE 1	2	SOMEWHAT ADEQUATE 3	4	ADEQUATE 5
Instructional technology (e.g., calculators, computers, probes/sensors)	7 (1.0)	4 (0.8)	19 (1.9)	22 (2.0)	48 (2.0)
Consumable supplies (e.g., chemicals, living organisms, batteries)	7 (1.1)	7 (1.5)	20 (1.5)	19 (1.5)	48 (2.2)
Equipment (e.g., thermometers, magnifying glasses, microscopes, beakers, photogate timers, Bunsen burners)	5 (1.0)	4 (0.8)	17 (1.7)	24 (1.9)	49 (2.1)
Facilities (e.g., lab tables, electric outlets, faucets and sinks)	7 (1.1)	6 (1.0)	15 (1.5)	14 (1.3)	58 (2.2)

Table STQ 55.1
Frequency of Use of Various Instructional Resources in Elementary School Science Classes

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL SCIENCE LESSONS
Commercially published textbooks (printed or electronic), including the supplementary materials (e.g., worksheets, laboratory handouts) that accompany the textbooks	26 (2.5)	17 (1.5)	19 (1.6)	21 (1.5)	17 (1.4)
Commercially published kits/modules (printed or electronic)	24 (1.9)	22 (1.5)	25 (2.1)	17 (1.6)	11 (1.4)
State, county, or district/diocese-developed units or lessons	28 (2.0)	20 (1.5)	21 (1.6)	20 (2.2)	12 (1.3)
Online units or courses that students work through at their own pace (e.g., i-Ready, Edgenuity)	67 (1.8)	16 (1.6)	9 (1.1)	5 (0.8)	2 (0.5)
Lessons or resources from websites that have a subscription fee or per lesson cost (e.g., BrainPOP, Discovery Ed, Teachers Pay Teachers)	13 (1.4)	12 (1.4)	26 (2.2)	34 (2.1)	16 (1.6)
Lessons or resources from websites that are free (e.g., Khan Academy, PhET)	32 (2.2)	20 (1.4)	25 (1.5)	18 (2.0)	5 (0.8)
Units or lessons you created (either by yourself or with others)	10 (1.0)	17 (1.6)	26 (1.9)	26 (1.6)	21 (1.9)
Units or lessons you collected from any other source (e.g., conferences, journals, colleagues, university or museum partners)	20 (1.4)	23 (1.5)	28 (1.8)	20 (1.7)	9 (1.7)

Table STQ 55.2
Frequency of Use of Various Instructional Resources in Middle School Science Classes

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL SCIENCE LESSONS
Commercially published textbooks (printed or electronic), including the supplementary materials (e.g., worksheets, laboratory handouts) that accompany the textbooks	10 (1.2)	20 (2.3)	25 (1.7)	26 (2.0)	19 (2.0)
Commercially published kits/modules (printed or electronic)	21 (1.7)	31 (2.1)	27 (1.6)	17 (1.9)	4 (1.2)
State, county, or district/diocese-developed units or lessons	35 (2.6)	26 (2.4)	18 (1.6)	13 (1.6)	8 (1.2)
Online units or courses that students work through at their own pace (e.g., i-Ready, Edgenuity)	58 (2.0)	19 (1.9)	14 (1.4)	8 (1.0)	1 (0.4)
Lessons or resources from websites that have a subscription fee or per lesson cost (e.g., BrainPOP, Discovery Ed, Teachers Pay Teachers)	17 (1.7)	16 (1.7)	33 (1.9)	27 (1.6)	7 (1.3)
Lessons or resources from websites that are free (e.g., Khan Academy, PhET)	11 (1.6)	21 (1.9)	37 (2.1)	26 (1.8)	5 (0.9)
Units or lessons you created (either by yourself or with others)	3 (1.1)	4 (0.8)	17 (1.9)	33 (1.8)	43 (2.3)
Units or lessons you collected from any other source (e.g., conferences, journals, colleagues, university or museum partners)	7 (0.8)	20 (1.4)	30 (2.0)	31 (2.2)	11 (1.5)

Table STQ 55.3
Frequency of Use of Various Instructional Resources in High School Science Classes

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL SCIENCE LESSONS
Commercially published textbooks (printed or electronic), including the supplementary materials (e.g., worksheets, laboratory handouts) that accompany the textbooks	9 (1.0)	18 (1.3)	23 (1.4)	31 (1.5)	19 (1.6)
Commercially published kits/modules (printed or electronic)	18 (1.2)	30 (1.4)	31 (1.6)	18 (1.4)	3 (0.5)
State, county, or district/diocese-developed units or lessons	46 (1.7)	23 (1.5)	16 (1.1)	9 (1.0)	5 (0.7)
Online units or courses that students work through at their own pace (e.g., i-Ready, Edgenuity)	59 (1.9)	19 (1.5)	13 (1.2)	7 (0.8)	2 (0.4)
Lessons or resources from websites that have a subscription fee or per lesson cost (e.g., BrainPOP, Discovery Ed, Teachers Pay Teachers)	47 (2.0)	19 (1.3)	19 (1.4)	13 (1.1)	2 (0.4)
Lessons or resources from websites that are free (e.g., Khan Academy, PhET)	10 (1.2)	20 (1.3)	39 (1.7)	25 (1.4)	6 (1.2)
Units or lessons you created (either by yourself or with others)	1 (0.2)	3 (0.6)	10 (0.9)	38 (1.8)	48 (1.8)
Units or lessons you collected from any other source (e.g., conferences, journals, colleagues, university or museum partners)	6 (0.9)	14 (1.0)	31 (1.5)	36 (1.6)	13 (1.4)

Table STQ 56
Science Classes for Which the District Designates Instructional Materials to Be Used

	PERCENT OF CLASSES
Elementary	72 (2.4)
Middle	66 (2.8)
High	58 (2.0)

Table STQ 57
Science Classes for Which Various Types of Instructional Materials Are Designated, by Grade Range

	PERCENT OF CLASSES		
	ELEMENTARY	MIDDLE	HIGH
Commercially published textbooks (printed or electronic), including the supplementary materials (e.g., worksheets, laboratory handouts) that accompany the textbooks	48 (2.7)	57 (2.9)	54 (2.0)
Commercially published kits/modules (printed or online)	37 (2.4)	24 (2.3)	12 (1.2)
State, county, or district/diocese-developed instructional materials	31 (1.8)	21 (1.7)	15 (1.1)
Online units or courses that students work through at their own pace (e.g., i-Ready, Edgenuity)	6 (0.9)	10 (1.3)	6 (1.1)
Lessons or resources from websites that have a subscription fee or per lesson cost (e.g., BrainPOP, Discovery Ed, Teachers Pay Teachers)	28 (2.3)	25 (2.1)	9 (0.9)
Lessons or resources from websites that are free (e.g., Khan Academy, PhET)	15 (1.5)	17 (1.6)	14 (1.2)

There is no table for STQ 58.

Table STQ 59a
Copyright Year of Instructional Materials Used in Science Classes, by Grade Range

	PERCENT OF CLASSES†		
	ELEMENTARY	MIDDLE	HIGH
2018	0 (0.1)	1 (0.7)	1 (0.3)
2017	3 (0.9)	4 (2.0)	4 (1.1)
2016	6 (1.3)	5 (1.4)	4 (0.7)
2015	9 (2.3)	4 (1.2)	7 (1.0)
2014	10 (2.5)	4 (1.4)	7 (1.0)
2013	2 (0.9)	4 (1.0)	7 (1.0)
2012 or earlier	71 (3.9)	78 (3.1)	70 (2.1)

† Includes only science classes for which teachers indicated in Q55 that they use commercially published textbooks/modules.

Table STQ 59b.1
Publishers of Textbooks Used in Elementary School Science Classes

	PERCENT OF CLASSES†
Houghton Mifflin Harcourt	27 (3.5)
McGraw-Hill Education	16 (2.3)
Pearson	16 (2.6)
Delta Education	13 (2.2)
Accelerate Learning	4 (1.3)
Carolina Biological Supply Company	4 (1.3)
Museum of Science	4 (2.9)
Cengage	2 (1.0)
Knowing Science	2 (1.4)
Amplify	1 (0.8)
Battle Creek Area Mathematics and Science Center	1 (0.7)
Learning Design Group	1 (0.5)
Mystery Science	1 (0.6)
NSTA Press	1 (0.4)
PNW Boces	1 (0.5)
Project Lead The Way	1 (0.6)
Studies Weekly	1 (0.3)
TCI	1 (1.2)
Abeka	0 (0.1)
Accelerated Christian Education	0 (0.1)
Activate Learning	0 (0.0)
AIMS Education Foundation	0 (0.4)
Alpha Omega Publications	0 (0.1)
Benchmark Education Company	0 (0.3)
Bob Jones University Press	0 (0.1)
BOCES	0 (0.1)
Carson-Dellosa	0 (0.2)
Core Knowledge Foundation	0 (0.0)
Creative3, LLC	0 (0.1)
DC Thomson	0 (0.3)
Discovery Education	0 (0.2)
ETA hand2mind	0 (0.3)
Evan-Moor	0 (0.2)
Heinemann	0 (0.1)
K'NEX Education	0 (0.3)
Kendall Hunt	0 (0.3)
Kindle Direct Publishing	0 (0.2)
Mentoring Minds	0 (0.1)
New Haven Public Schools	0 (0.3)
Purposeful Design	0 (0.1)
Sadlier	0 (0.1)
Scholastic	0 (0.2)

SciTT Kits	0 (0.1)
Sundance/Newbridge	0 (0.2)
Teacher Created Materials	0 (0.2)
Texas Education Agency	0 (0.1)
The Education Center	0 (0.3)

† Includes only elementary school science classes for which teachers indicated in Q55 that they use commercially published textbooks/modules.

Table STQ 59b.2
Publishers of Textbooks Used in Middle School Science Classes

	PERCENT OF CLASSES†
Houghton Mifflin Harcourt	27 (2.9)
Pearson	27 (2.2)
McGraw-Hill Education	25 (2.5)
Accelerate Learning	4 (1.1)
Lab-Aids	3 (1.1)
Carolina Biological Supply Company	2 (0.8)
Delta Education	2 (0.9)
Abeka	1 (1.0)
Activate Learning	1 (0.5)
Alpha Omega Publications	1 (0.7)
CK-12	1 (0.4)
Frey Scientific	1 (0.7)
Kindle Direct Publishing	1 (0.7)
Wieser Educational	1 (0.3)
American Modeling Teachers Association	0 (0.1)
AMSCO School Publications	0 (0.2)
Battle Creek Area Mathematics and Science Center	0 (0.3)
Bob Jones University Press	0 (0.2)
Cengage	0 (0.2)
Coordination Group Publications	0 (0.3)
Discovery Education	0 (0.2)
DK	0 (0.1)
Mastery Education	0 (0.1)
Perfection Learning	0 (0.1)
Project Lead The Way	0 (0.2)
Purposeful Design Publications	0 (0.1)
Region 4 Education Service Center	0 (0.2)
Science Curriculum Inc.	0 (0.2)
Stephanie Elkowitz	0 (0.2)
Triumph Learning	0 (0.3)
United Publishing Company	0 (0.1)

† Includes only middle school science classes for which teachers indicated in Q55 that they use commercially published textbooks/modules.

Table STQ 59b.3
Publishers of Textbooks Used in High School Science Classes

	PERCENT OF CLASSES†
Pearson	43 (2.0)
McGraw-Hill Education	20 (2.1)
Houghton Mifflin Harcourt	19 (1.6)
Cengage	5 (0.7)
Macmillan	2 (0.4)
Alpha Omega Publications	1 (0.5)
Continental Press	1 (0.8)
Frey Scientific	1 (0.4)
Kendall Hunt	1 (0.3)
OpenStax	1 (0.4)
Wiley	1 (0.3)
A.J. Girondi	0 (0.2)
Accelerate Learning	0 (0.1)
Activate Learning	0 (0.1)
Anchor	0 (0.2)
Apologia Educational Ministries	0 (0.0)
Author Solutions LLC	0 (0.5)
Bob Jones University Press	0 (0.2)
Cambridge University Press	0 (0.1)
Campaign for Science and Engineering	0 (0.1)
Centre for Applied Research in Education	0 (0.1)
CK-12	0 (0.0)
CORD Communications	0 (0.0)
Current Publishing Corp	0 (0.1)
Edvantage Science	0 (0.1)
Elsevier	0 (0.2)
F.A. Davis Company	0 (0.1)
Flinn Scientific	0 (0.0)
Goodheart-Willcox	0 (0.2)
High Marks Made Easy	0 (0.4)
Interstate Publishers	0 (0.2)
It's About Time	0 (0.1)
Kindle Direct Publishing	0 (0.0)
Lab-Aids	0 (0.1)
NAF	0 (0.1)
New Jersey Center for Teaching and Learning	0 (0.2)
NSTA Press	0 (0.3)
Oxford University Press	0 (0.1)
PASCO Scientific	0 (0.2)
Perfection Learning	0 (0.1)
Physics Curriculum & Instruction	0 (0.0)
Project Lead The Way	0 (0.1)

The Princeton Review	0 (0.1)
University Press of Florida	0 (0.4)
Usbourne	0 (0.0)
W. H. Freeman	0 (0.1)
Wolters Kluwer	0 (0.0)

† Includes only high school science classes for which teachers indicated in Q55 that they use commercially published textbooks/modules.

Table STQ 60.1
Elementary School Science Classes in Which Teachers Report the Effect Various Factors Have on Science Instruction

	PERCENT OF CLASSES					
	INHIBITS EFFECTIVE INSTRUCTION 1	2	NEUTRAL OR MIXED 3	4	PROMOTES EFFECTIVE INSTRUCTION 5	N/A
Current state standards	3 (0.7)	2 (0.7)	30 (2.1)	21 (1.8)	41 (2.4)	4 (1.2)
District/Diocese and/or school pacing guides	6 (1.0)	5 (1.0)	31 (2.3)	20 (1.9)	29 (2.4)	9 (1.3)
State/district/diocese testing/accountability policies†	8 (1.1)	8 (1.5)	38 (2.2)	16 (1.9)	15 (1.5)	14 (1.8)
Textbook/module selection policies	11 (1.9)	11 (1.6)	35 (2.6)	13 (1.6)	14 (1.8)	17 (1.6)
Teacher evaluation policies	4 (0.8)	8 (1.4)	42 (2.5)	14 (1.7)	19 (2.4)	13 (1.8)
Students' prior knowledge and skills	7 (1.4)	8 (1.3)	24 (2.0)	25 (2.0)	34 (2.6)	2 (0.6)
Students' motivation, interest, and effort in science	4 (0.9)	5 (1.2)	15 (1.7)	24 (1.9)	50 (2.7)	2 (0.6)
Parent/guardian expectations and involvement	7 (1.3)	10 (1.1)	41 (1.9)	15 (1.6)	19 (1.8)	8 (1.4)
Principal support	3 (0.8)	3 (0.9)	28 (2.2)	20 (1.8)	42 (2.4)	5 (1.2)
Amount of time for you to plan, individually and with colleagues	10 (1.3)	10 (1.2)	21 (2.2)	19 (1.7)	37 (2.7)	2 (0.8)
Amount of time available for your professional development	12 (1.4)	13 (1.5)	28 (2.1)	18 (2.3)	25 (2.3)	5 (1.0)
Amount of instructional time devoted to science	14 (1.9)	14 (1.6)	22 (2.3)	17 (1.8)	32 (2.6)	2 (0.7)

† This item was presented only to public and Catholic school teachers.

Table STQ 60.2
Middle School Science Classes in Which Teachers Report the Effect Various Factors Have on Science Instruction

	PERCENT OF CLASSES					
	INHIBITS EFFECTIVE INSTRUCTION 1	2	NEUTRAL OR MIXED 3	4	PROMOTES EFFECTIVE INSTRUCTION 5	N/A OR DON'T KNOW
Current state standards	4 (1.3)	4 (1.0)	24 (2.2)	24 (2.6)	42 (3.2)	2 (0.6)
District/Diocese and/or school pacing guides	3 (0.7)	7 (1.3)	29 (2.7)	19 (2.0)	27 (2.3)	16 (2.7)
State/district/diocese testing/accountability policies†	8 (1.3)	16 (2.1)	34 (2.6)	16 (2.2)	15 (1.5)	11 (2.2)
Textbook/module selection policies	6 (1.3)	11 (1.9)	36 (2.3)	18 (1.8)	14 (2.3)	17 (2.1)
Teacher evaluation policies	5 (1.1)	9 (1.3)	42 (2.6)	20 (2.2)	18 (1.9)	6 (1.5)
Students' prior knowledge and skills	11 (2.0)	15 (2.0)	19 (1.5)	28 (2.4)	27 (2.4)	0 (0.3)
Students' motivation, interest, and effort in science	12 (1.8)	12 (1.6)	18 (1.8)	22 (2.0)	36 (2.4)	0 (0.3)
Parent/guardian expectations and involvement	11 (1.9)	15 (2.2)	32 (2.3)	18 (1.7)	21 (2.2)	3 (1.3)
Principal support	4 (1.1)	6 (1.8)	19 (1.9)	22 (2.6)	47 (3.0)	2 (1.0)
Amount of time for you to plan, individually and with colleagues	8 (2.1)	11 (1.7)	14 (1.5)	23 (2.2)	43 (2.9)	1 (0.4)
Amount of time available for your professional development	8 (1.9)	11 (1.6)	29 (2.5)	23 (1.8)	28 (2.4)	2 (0.6)

† This item was presented only to public and Catholic school teachers.

Table STQ 60.3
High School Science Classes in Which Teachers Report the Effect Various Factors Have on Science Instruction

	PERCENT OF CLASSES					
	INHIBITS EFFECTIVE INSTRUCTION 1	2	NEUTRAL OR MIXED 3	4	PROMOTES EFFECTIVE INSTRUCTION 5	N/A OR DON'T KNOW
Current state standards	2 (0.4)	5 (0.8)	34 (1.7)	20 (1.6)	29 (2.0)	10 (1.2)
District/Diocese and/or school pacing guides	3 (0.9)	5 (0.8)	31 (2.2)	15 (1.2)	20 (1.4)	25 (2.1)
State/district/diocese testing/accountability policies†	8 (1.1)	12 (1.5)	37 (1.9)	12 (1.1)	11 (1.0)	20 (1.5)
Textbook/module selection policies	4 (0.7)	8 (1.1)	38 (1.9)	15 (1.4)	15 (1.8)	21 (1.7)
Teacher evaluation policies	5 (0.8)	7 (0.9)	39 (1.8)	18 (1.6)	20 (1.5)	11 (1.4)
College entrance requirements	1 (0.3)	3 (0.7)	38 (1.9)	24 (1.7)	22 (1.8)	12 (1.4)
Students' prior knowledge and skills	6 (0.9)	13 (1.2)	21 (2.3)	27 (1.6)	31 (2.0)	1 (0.5)
Students' motivation, interest, and effort in science	7 (0.8)	13 (1.4)	19 (1.8)	23 (1.6)	36 (1.9)	1 (0.5)
Parent/guardian expectations and involvement	5 (0.8)	12 (1.1)	37 (2.4)	19 (2.1)	23 (1.8)	5 (0.9)
Principal support	3 (0.9)	4 (0.6)	26 (1.7)	20 (1.5)	43 (1.9)	4 (0.8)
Amount of time for you to plan, individually and with colleagues	5 (1.1)	9 (1.0)	16 (1.6)	23 (1.7)	43 (2.3)	4 (0.7)
Amount of time available for your professional development	6 (1.1)	13 (1.2)	27 (1.6)	23 (1.7)	28 (1.9)	4 (0.8)

† This item was presented only to public and Catholic school teachers.

Table STQ 61
Focus of the Most Recently Completed Science Unit, by Grade Range

	PERCENT OF CLASSES		
	ELEMENTARY	MIDDLE	HIGH
Earth/space science	34 (2.0)	30 (2.0)	7 (1.1)
Life science/biology	36 (1.9)	35 (2.2)	41 (1.7)
Environmental science/ecology	13 (1.3)	9 (1.6)	8 (1.1)
Chemistry	2 (0.5)	8 (1.0)	26 (1.3)
Physics	11 (1.8)	17 (1.5)	17 (1.1)
Engineering	5 (0.9)	1 (0.5)	1 (0.3)

Table STQ 62
Most Recent Science Unit Based Primarily on Any Commercially Published Textbook/Module or State/County/District-Developed Materials

	PERCENT OF CLASSES†
Elementary	65 (2.1)
Middle	54 (2.3)
High	54 (1.9)

† Includes only science classes for which teachers indicated in Q57 that they use commercially published textbooks/modules or state/county/district/diocese-developed units or lessons more than once a month.

Table STQ 63.1
Ways Instructional Materials Were Used in the Most Recently Completed Unit in Elementary School Science Classes

	PERCENT OF CLASSES†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
I used these materials to guide the structure and content emphasis of the unit.	1 (0.5)	1 (0.5)	21 (3.3)	33 (2.7)	44 (2.4)
I picked what is important from these materials and skipped the rest.	11 (1.7)	12 (1.6)	26 (2.2)	36 (3.1)	15 (1.7)
I incorporated activities (e.g., problems, investigations, readings) from other sources to supplement what these materials were lacking.	6 (1.3)	7 (1.4)	21 (1.9)	38 (3.3)	27 (2.7)
I modified activities from these materials.	5 (1.4)	9 (1.5)	27 (2.1)	36 (2.6)	23 (3.2)

† Includes only elementary school science classes for which teachers responded yes in Q62.

Table STQ 63.2
Ways Instructional Materials Were Used in the Most Recently Completed Unit in Middle School Science Classes

	PERCENT OF CLASSES†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
I used these materials to guide the structure and content emphasis of the unit.	0 (0.3)	3 (0.9)	24 (2.6)	32 (2.4)	41 (2.7)
I picked what is important from these materials and skipped the rest.	9 (2.3)	10 (1.7)	26 (3.4)	30 (3.2)	24 (2.4)
I incorporated activities (e.g., problems, investigations, readings) from other sources to supplement what these materials were lacking.	2 (1.1)	6 (1.6)	15 (2.0)	37 (3.1)	41 (3.4)
I modified activities from these materials.	1 (0.6)	6 (1.4)	24 (2.6)	38 (3.5)	31 (3.0)

† Includes only middle school science classes for which teachers responded yes in Q62.

Table STQ 63.3
Ways Instructional Materials Were Used in the Most Recently Completed Unit in High School Science Classes

	PERCENT OF CLASSES†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
I used these materials to guide the structure and content emphasis of the unit.	1 (0.3)	2 (0.6)	21 (1.9)	36 (2.9)	40 (2.7)
I picked what is important from these materials and skipped the rest.	8 (1.5)	11 (1.7)	28 (2.3)	30 (2.3)	23 (2.3)
I incorporated activities (e.g., problems, investigations, readings) from other sources to supplement what these materials were lacking.	2 (0.7)	4 (1.3)	16 (1.8)	36 (2.6)	42 (2.6)
I modified activities from these materials.	2 (0.5)	5 (1.4)	21 (2.2)	41 (3.1)	30 (2.3)

† Includes only high school science classes for which teachers responded yes in Q62.

Table STQ 64.1
Reasons Parts of the Instructional Materials Were Skipped in Elementary School Science Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
The science ideas addressed in the activities I skipped are not included in my pacing guide/standards.	37 (3.9)	38 (4.1)	25 (3.0)
I did not have the materials needed to implement the activities I skipped.	38 (4.5)	36 (4.4)	25 (2.9)
I did not have the knowledge needed to implement the activities I skipped.	76 (3.3)	21 (3.2)	3 (1.0)
The activities I skipped were too difficult for my students.	62 (3.7)	26 (3.0)	11 (2.0)
My students already knew the science ideas or were able to learn them without the activities I skipped.	51 (3.5)	37 (4.3)	13 (2.5)
I have different activities for those science ideas that work better than the ones I skipped.	31 (3.9)	33 (3.4)	36 (4.4)
I did not have enough instructional time for the activities I skipped.	26 (4.5)	35 (3.4)	39 (3.3)

† Includes only elementary school science classes for which teachers responded yes in Q62 and indicated in Q63 that they "picked what was important from these materials and skipped the rest" to any extent.

Table STQ 64.2
Reasons Parts of the Instructional Materials Were Skipped in Middle School Science Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
The science ideas addressed in the activities I skipped are not included in my pacing guide/standards.	24 (3.4)	38 (4.4)	38 (4.6)
I did not have the materials needed to implement the activities I skipped.	44 (4.1)	34 (4.0)	22 (3.5)
I did not have the knowledge needed to implement the activities I skipped.	75 (4.4)	21 (4.2)	4 (1.6)
The activities I skipped were too difficult for my students.	57 (3.9)	29 (3.4)	14 (3.3)
My students already knew the science ideas or were able to learn them without the activities I skipped.	48 (4.4)	37 (3.8)	15 (3.2)
I have different activities for those science ideas that work better than the ones I skipped.	17 (3.4)	38 (3.4)	44 (3.8)
I did not have enough instructional time for the activities I skipped.	27 (3.6)	47 (4.1)	25 (3.6)

† Includes only middle school science classes for which teachers responded yes in Q62 and indicated in Q63 that they "picked what was important from these materials and skipped the rest" to any extent.

Table STQ 64.3
Reasons Parts of the Instructional Materials Were Skipped in High School Science Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
The science ideas addressed in the activities I skipped are not included in my pacing guide/standards.	27 (3.2)	40 (3.1)	32 (3.7)
I did not have the materials needed to implement the activities I skipped.	46 (3.7)	38 (3.4)	17 (2.6)
I did not have the knowledge needed to implement the activities I skipped.	80 (2.6)	14 (2.1)	6 (1.8)
The activities I skipped were too difficult for my students.	41 (3.4)	43 (3.7)	16 (2.7)
My students already knew the science ideas or were able to learn them without the activities I skipped.	48 (3.5)	35 (3.5)	17 (2.6)
I have different activities for those science ideas that work better than the ones I skipped.	23 (4.0)	31 (3.2)	46 (3.8)
I did not have enough instructional time for the activities I skipped.	26 (3.5)	38 (3.0)	37 (3.7)

† Includes only high school science classes for which teachers responded yes in Q62 and indicated in Q63 that they "picked what was important from these materials and skipped the rest" to any extent.

Table STQ 65.1
Reasons Why the Instructional Materials Were Supplemented in Elementary School Science Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
My pacing guide indicated that I should use supplemental activities.	58 (3.6)	28 (3.0)	14 (2.9)
Supplemental activities were needed to prepare students for standardized tests.	53 (3.7)	31 (3.0)	16 (3.0)
Supplemental activities were needed to provide students with additional practice.	23 (2.8)	42 (4.1)	35 (3.0)
Supplemental activities were needed so students at different levels of achievement could increase their understanding of the ideas targeted in each activity.	16 (2.4)	37 (3.5)	47 (4.5)
I had additional activities that I liked.	18 (3.2)	36 (3.3)	46 (4.6)

† Includes only elementary school science classes for which teachers responded yes in Q62 and indicated in Q63 that they "incorporated activities (e.g., problems, investigations, readings) from other sources to supplement what these materials were lacking" to any extent.

Table STQ 65.2
Reasons Why the Instructional Materials Were Supplemented in Middle School Science Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
My pacing guide indicated that I should use supplemental activities.	51 (3.9)	36 (3.3)	13 (2.6)
Supplemental activities were needed to prepare students for standardized tests.	40 (3.9)	37 (3.5)	23 (3.0)
Supplemental activities were needed to provide students with additional practice.	10 (2.3)	43 (4.5)	47 (4.1)
Supplemental activities were needed so students at different levels of achievement could increase their understanding of the ideas targeted in each activity.	10 (2.6)	34 (4.1)	56 (4.1)
I had additional activities that I liked.	14 (2.6)	38 (4.0)	49 (4.4)

† Includes only middle school science classes for which teachers responded yes in Q62 and indicated in Q63 that they "incorporated activities (e.g., problems, investigations, readings) from other sources to supplement what these materials were lacking" to any extent.

Table STQ 65.3
Reasons Why the Instructional Materials Were Supplemented in High School Science Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
My pacing guide indicated that I should use supplemental activities.	54 (3.3)	33 (3.5)	13 (2.1)
Supplemental activities were needed to prepare students for standardized tests.	47 (3.6)	30 (3.0)	23 (2.7)
Supplemental activities were needed to provide students with additional practice.	14 (3.7)	35 (3.1)	51 (3.5)
Supplemental activities were needed so students at different levels of achievement could increase their understanding of the ideas targeted in each activity.	14 (3.5)	31 (2.6)	55 (3.7)
I had additional activities that I liked.	12 (2.6)	43 (4.1)	44 (3.6)

† Includes only high school science classes for which teachers responded yes in Q62 and indicated in Q63 that they "incorporated activities (e.g., problems, investigations, readings) from other sources to supplement what these materials were lacking" to any extent.

Table STQ 66.1
Reasons Why the Instructional Materials Were Modified in Elementary School Science Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
I did not have the necessary materials/supplies for the original activities.	40 (3.8)	37 (3.0)	23 (3.0)
The original activities were too difficult conceptually for my students.	54 (4.1)	33 (3.8)	13 (2.2)
The original activities were too easy conceptually for my students.	65 (3.5)	31 (3.3)	5 (1.4)
I did not have enough instructional time to implement the activities as designed.	30 (3.9)	30 (3.2)	40 (3.5)
The original activities were too structured for my students.	64 (4.2)	33 (4.2)	3 (1.3)
The original activities were not structured enough for my students.	58 (4.3)	36 (4.5)	7 (1.9)

† Includes only elementary school science classes for which teachers responded yes in Q62 and indicated in Q63 that they "modified activities from these materials" to any extent.

Table STQ 66.2
Reasons Why the Instructional Materials Were Modified in Middle School Science Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
I did not have the necessary materials/supplies for the original activities.	38 (3.6)	42 (4.1)	20 (3.4)
The original activities were too difficult conceptually for my students.	46 (3.9)	39 (4.2)	15 (3.7)
The original activities were too easy conceptually for my students.	54 (4.0)	39 (3.8)	7 (2.2)
I did not have enough instructional time to implement the activities as designed.	30 (3.5)	40 (3.2)	30 (4.0)
The original activities were too structured for my students.	67 (4.0)	31 (4.1)	3 (1.1)
The original activities were not structured enough for my students.	59 (3.8)	33 (3.3)	8 (2.2)

† Includes only middle school science classes for which teachers responded yes in Q62 and indicated in Q63 that they "modified activities from these materials" to any extent.

Table STQ 66.3
Reasons Why the Instructional Materials Were Modified in High School Science Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
I did not have the necessary materials/supplies for the original activities.	47 (3.4)	35 (3.1)	18 (2.9)
The original activities were too difficult conceptually for my students.	42 (3.3)	42 (3.2)	16 (2.7)
The original activities were too easy conceptually for my students.	56 (3.6)	39 (3.7)	5 (1.3)
I did not have enough instructional time to implement the activities as designed.	29 (2.8)	44 (3.1)	26 (3.2)
The original activities were too structured for my students.	62 (3.1)	32 (3.1)	6 (1.9)
The original activities were not structured enough for my students.	60 (3.5)	33 (3.4)	7 (1.7)

† Includes only high school science classes for which teachers responded yes in Q62 and indicated in Q63 that they "modified activities from these materials" to any extent.

Table STQ 67.1
Elementary School Science Classes Taught by Teachers Feeling Prepared for Each of a Number of Tasks in the Most Recent Unit

	PERCENT OF CLASSES			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
Anticipate difficulties that students may have with particular science ideas and procedures in this unit	3 (0.6)	24 (1.7)	50 (2.2)	22 (1.9)
Find out what students thought or already knew about the key science ideas	3 (0.9)	17 (1.4)	49 (2.1)	31 (2.2)
Implement the instructional materials (e.g., textbook, module) to be used during this unit	5 (0.8)	16 (1.6)	47 (2.2)	32 (2.0)
Monitor student understanding during this unit	2 (0.5)	14 (1.4)	51 (2.0)	33 (1.9)
Assess student understanding at the conclusion of this unit	3 (0.6)	15 (1.4)	50 (2.1)	32 (1.8)

Table STQ 67.2
Middle School Science Classes Taught by Teachers Feeling Prepared for Each of a Number of Tasks in the Most Recent Unit

	PERCENT OF CLASSES			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
Anticipate difficulties that students may have with particular science ideas and procedures in this unit	1 (0.7)	15 (1.8)	47 (2.2)	37 (2.1)
Find out what students thought or already knew about the key science ideas	1 (0.6)	14 (1.4)	46 (1.9)	39 (2.1)
Implement the instructional materials (e.g., textbook, module) to be used during this unit	2 (0.8)	12 (1.3)	41 (2.3)	45 (2.4)
Monitor student understanding during this unit	1 (0.3)	8 (1.2)	40 (1.9)	51 (2.1)
Assess student understanding at the conclusion of this unit	1 (0.2)	6 (1.1)	35 (2.0)	58 (2.0)

Table STQ 67.3
High School Science Classes Taught by Teachers Feeling Prepared for Each of a Number of Tasks in the Most Recent Unit

	PERCENT OF CLASSES			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
Anticipate difficulties that students may have with particular science ideas and procedures in this unit	1 (0.3)	10 (1.1)	44 (1.9)	45 (1.6)
Find out what students thought or already knew about the key science ideas	1 (0.2)	12 (1.3)	49 (1.6)	38 (1.6)
Implement the instructional materials (e.g., textbook, module) to be used during this unit	1 (0.3)	8 (0.8)	38 (1.7)	53 (1.6)
Monitor student understanding during this unit	0 (0.1)	5 (0.7)	42 (1.9)	53 (1.8)
Assess student understanding at the conclusion of this unit	0 (0.2)	4 (0.6)	36 (1.9)	59 (1.8)

Table STQ 68
Duration of the Most Recent Science Lesson

	AVERAGE NUMBER OF MINUTES
Elementary	44 (1.0)
Middle	56 (0.7)
High	62 (0.9)

Table STQ 69
Average Percentage of Time Spent on Different Activities in the Most Recent Science Lesson, by Grade Range

	AVERAGE PERCENT OF CLASS TIME		
	ELEMENTARY	MIDDLE	HIGH
Non-instructional activities (e.g., attendance taking, interruptions)	8 (0.4)	12 (0.3)	10 (0.2)
Whole class activities (e.g., lectures, explanations, discussions)	41 (0.9)	32 (0.8)	38 (0.8)
Small group work	33 (1.0)	35 (1.1)	34 (0.8)
Students working individually (e.g., reading textbooks, completing worksheets, taking a test or quiz)	18 (0.8)	22 (0.8)	19 (0.8)

Table STQ 70
Science Classes Participating in Various Activities in the Most Recent Lesson, by Grade Range

	PERCENT OF CLASSES		
	ELEMENTARY	MIDDLE	HIGH
Teacher explaining a science idea to the whole class	83 (1.5)	74 (2.2)	81 (1.3)
Teacher conducting a demonstration while students watched	37 (2.1)	30 (2.1)	31 (1.6)
Whole class discussion	86 (1.2)	67 (2.3)	59 (1.6)
Students working in small groups	78 (1.5)	85 (1.3)	81 (1.4)
Students completing textbook/worksheet problems	35 (1.8)	39 (2.2)	44 (1.6)
Students doing hands-on/laboratory activities	47 (2.1)	46 (2.0)	40 (1.6)
Students reading about science	45 (2.1)	48 (2.6)	29 (1.6)
Students writing about science (does not include students taking notes)	45 (2.3)	46 (2.6)	34 (1.8)
Practicing for standardized tests	2 (0.6)	8 (1.0)	8 (0.9)
Test or quiz	9 (1.1)	14 (1.5)	16 (1.2)
None of the above	1 (0.3)	1 (0.5)	1 (0.4)

Table STQ 71
Sex of Science Teachers, by Grade Range

	PERCENT OF TEACHERS		
	ELEMENTARY	MIDDLE	HIGH
Female	94 (0.7)	71 (1.8)	57 (1.9)
Male	6 (0.7)	28 (1.8)	43 (1.9)
Other	0 (0.1)	0 (0.2)	0 (0.0)

Table STQ 72
Science Teachers of Hispanic or Latino Origin

	PERCENT OF TEACHERS
Elementary	9 (1.6)
Middle	7 (1.2)
High	6 (0.8)

Table STQ 73
Race of Science Teachers, by Grade Range

	PERCENT OF TEACHERS		
	ELEMENTARY	MIDDLE	HIGH
American Indian or Alaskan Native	1 (0.6)	2 (0.6)	2 (0.5)
Asian	2 (0.6)	2 (0.5)	5 (0.9)
Black or African American	8 (1.2)	8 (1.5)	5 (0.9)
Native Hawaiian or Other Pacific Islander	1 (0.4)	0 (0.2)	0 (0.1)
White	88 (1.5)	91 (1.5)	91 (1.2)

Table STQ 74
Age of Science Teachers

	MEAN AGE OF TEACHERS
Elementary	42 (0.4)
Middle	43 (0.5)
High	44 (0.4)

Mathematics Teacher Questionnaire
Mathematics Teacher Questionnaire Tables

2018 NSSME+
Mathematics Teacher Questionnaire

Teacher Background and Opinions

1. How many years have you taught prior to this school year: [Enter each response as a whole number (for example: 15).]

a. any subject at the K–12 level?	
b. mathematics at the K–12 level?	
c. at this school, any subject?	

2. At what grade levels do you currently teach mathematics? [Select all that apply.]

☐	K–5
☐	6–8
☐	9–12
☐	I do not currently teach mathematics.

3. ***[Presented to self-contained teachers only]***
Which best describes the mathematics instruction provided to the entire class?
   - Do not consider pull-out instruction that some students may receive for remediation or enrichment.
   - Do not consider instruction provided to individual or small groups of students, for example by an English-language specialist, special educator, or teacher assistant.

○	This class receives mathematics instruction only from you. ***[Presented only to teachers who answered in Q2 that they teach mathematics]***
○	This class receives mathematics instruction from you and other teachers (for example: a mathematics specialist or a teacher you team with). ***[Presented only to teachers who answered in Q2 that they teach mathematics]***
○	This class receives mathematics instruction only from another teacher (for example: a mathematics specialist or a teacher you team with). [Presented only to teachers who answered in Q2 that they do not currently teach mathematics] ***[Teacher ineligible, exit survey]***
○	This class does not receive mathematics instruction this year. ***[Presented only to teachers who answered in Q2 that they do not currently teach mathematics] [Teacher ineligible, exit survey]***

4. Omitted – Used only for survey routing.

5. ***[Presented to self-contained teachers only]***
Which best describes your mathematics teaching?

○	I teach mathematics all or most days, every week of the year.
○	I teach mathematics every week, but typically three or fewer days each week.
○	I teach mathematics some weeks, but typically not every week.

6. *[Presented to self-contained teachers only]*
Which best describes your science teaching?

○	I teach science all or most days, every week of the year.
○	I teach science every week, but typically three or fewer days each week.
○	I teach science some weeks, but typically not every week. *[Skip to Q8]*
○	I do not teach science.

7. *[Presented to self-contained teachers only]*
In a typical week, how many days do you teach lessons on each of the following subjects and how many minutes per week are spent on each subject? [Enter each response as a whole number (for example: 5, 150).]

	NUMBER OF DAYS PER WEEK	TOTAL NUMBER OF MINUTES PER WEEK
a. Mathematics		
b. Science		
c. Social Studies		
d. Reading/Language Arts		

8. *[Presented to self-contained teachers who skipped Q7 only]*
In a typical year, how many weeks do you teach lessons on each of the following subjects and how many minutes per week are spent on each subject? [Enter each response as a whole number (for example: 36, 150).]

	NUMBER OF WEEKS PER YEAR	AVERAGE NUMBER OF MINUTES PER WEEK WHEN TAUGHT
a. Mathematics		
b. Science		
c. Social Studies		
d. Reading/Language Arts		

9. *[Presented to non-self-contained teachers only]*
In a typical week, how many different mathematics classes (sections) are you currently teaching?
- If you meet with the *same class of students* multiple times per week, count that class only once.
- If you teach the *same mathematics course* to multiple classes of students, count each class separately.

1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○

10. ***[Presented to non-self-contained teachers only]***

For each mathematics class you currently teach, select the course type and enter the number of students enrolled. Enter the classes in the order that you teach them. For teachers on an alternating day block schedule, please order your classes starting with the first class you teach this week. Select one course type on each row and enter the number of students as a whole number (for example: 25).]

GRADES 9–12 COURSE TYPE	EXAMPLE COURSES
Non-college prep mathematics courses	Developmental Math; High School Arithmetic; Remedial Math; General Math; Vocational Math; Consumer Math; Basic Math; Business Math; Career Math; Practical Math; Essential Math; Pre-Algebra; Introductory Algebra; Algebra 1 Part 1; Algebra 1A; Math A; Basic Geometry; Informal Geometry; Practical Geometry
Formal/College prep mathematics level 1 courses	Algebra 1; Math 1; Integrated/Unified Math I; Algebra 1 Part 2; Algebra 1B; Math B
Formal/College prep mathematics level 2 courses	Geometry; Plane Geometry; Solid Geometry; Math 2; Integrated/Unified Math II; Math C
Formal/College prep mathematics level 3 courses	Algebra 2; Intermediate Algebra; Algebra and Trigonometry; Advanced Algebra; Math 3; Integrated/Unified Math III
Formal/College prep mathematics level 4 courses	Algebra 3; Trigonometry; Pre-Calculus; Analytic/Advanced Geometry; Elementary Functions; Integrated Math 4; Unified Math IV; Calculus (not including college level/AP); any other college prep senior math with Algebra 2/Math 3 as a prerequisite
Mathematics courses that might qualify for college credit	Advanced Placement Calculus (AB, BC); Advanced Placement Statistics; IB Mathematics Standard Level; IB Mathematics Higher Level; concurrent college and high school credit/dual enrollment

CLASS	COURSE TYPE	NUMBER OF STUDENTS ENROLLED
Your 1st mathematics class:		
Your 2nd mathematics class:		
…		
Your 10th mathematics class:		

COURSE TYPE LIST	
1	Mathematics (Grades K–5)
2	Remedial Mathematics 6
3	Regular Mathematics 6
4	Accelerated/Pre-Algebra Mathematics 6
5	Remedial Mathematics 7
6	Regular Mathematics 7
7	Accelerated Mathematics 7
8	Remedial Mathematics 8
9	Regular Mathematics 8
10	Accelerated Mathematics 8
11	Algebra 1, Grade 7 or 8
12	Non-college prep mathematics course (Grades 9–12)
13	Formal/College prep mathematics level 1 course (Grades 9–12)
14	Formal/College prep mathematics level 2 course (Grades 9–12)
15	Formal/College prep mathematics level 3 course (Grades 9–12)
16	Formal/College prep mathematics level 4 course (Grades 9–12)
17	Mathematics course that might qualify for college credit (Grades 9–12)

11. ***[Presented to non-self-contained teachers only]***
Later in this questionnaire, we will ask you questions about your *[[x^th]]* mathematics class, which you indicated was *[[type indicated in Q10]]*. What is your school's title for this course? _______________

12. Have you been awarded one or more bachelor's and/or graduate degrees in the following fields? (With regard to bachelor's degrees, count only areas in which you majored. Do not include endorsements or certificates.) [Select one on each row.]

	YES	NO
a. Education (general or subject specific such as mathematics education)	○	○
b. Mathematics	○	○
c. Statistics	○	○
d. Computer Science	○	○
e. Engineering	○	○
f. Other, please specify.___________	○	○

13. ***[Presented only to teachers that selected "Yes" for Q12a]***
What type of education degree do you have? (With regard to bachelor's degrees, count only areas in which you majored.) [Select all that apply.]

☐	Elementary Education
☐	Mathematics Education
☐	Science Education
☐	Other education, please specify. ___________

14. Did you complete any of the following mathematics courses at the undergraduate or graduate level? [Select one on each row.]

		YES	NO
a.	Mathematics content for elementary school teachers	○	○
b.	Mathematics content for middle school teachers	○	○
c.	Mathematics content for high school teachers	○	○
d.	Integrated mathematics (a single course that addresses content across ***multiple*** mathematics subjects, such as algebra and geometry)	○	○
e.	College algebra/trigonometry/functions	○	○
f.	Abstract algebra (for example: groups, rings, ideals, fields) ***[Presented to grades 6–12 teachers only]***	○	○
g.	Linear algebra (for example: vectors, matrices, eigenvalues) ***[Presented to grades 6–12 teachers only]***	○	○
h.	Calculus	○	○
i.	Advanced calculus ***[Presented to grades 6–12 teachers only]***	○	○
j.	Real analysis ***[Presented to grades 6–12 teachers only]***	○	○
k.	Differential equations ***[Presented to grades 6–12 teachers only]***	○	○
l.	Analytic/Coordinate Geometry (for example: transformations or isometries, conic sections) ***[Presented to grades 6–12 teachers only]***	○	○
m.	Axiomatic Geometry (Euclidean or non-Euclidean) ***[Presented to grades 6–12 teachers only]***	○	○
n.	College geometry ***[Presented to grades K–5 teachers only]***	○	○
o.	Probability	○	○
p.	Statistics	○	○
q.	Number theory (for example: divisibility theorems, properties of prime numbers) ***[Presented to grades 6–12 teachers only]***	○	○
r.	Discrete mathematics (for example: combinatorics, graph theory, game theory)	○	○
s.	Other upper division mathematics	○	○

15. Did you complete one or more courses in each of the following areas at the undergraduate or graduate level? [Select one on each row.]

		YES	NO
a.	Computer science	○	○
b.	Engineering	○	○

16. Which of the following best describes the program you completed to earn your teaching credential (sometimes called certification or license)?

○	An undergraduate program leading to a bachelor's degree and a teaching credential
○	A post-baccalaureate credentialing program (no master's degree awarded)
○	A master's program that also led to a teaching credential
○	I have not completed a program to earn a teaching credential.

17. After completing your undergraduate degree and prior to becoming a teacher, did you have a full-time job in a mathematics-related field (for example: accounting, engineering, computer programming)?

○	Yes
○	No

Professional Development

The questions in this section ask about your participation in professional development focused on mathematics or mathematics teaching. When answering these questions, please include:

- face-to-face and/or online courses;
- professional meetings/conferences;
- workshops;
- professional learning communities/lesson studies/teacher study groups; and
- coaching and mentoring.

Do not include:

- courses you took prior to becoming a teacher; and
- time spent providing professional development (including coaching and mentoring) for other teachers.

18. When did you **last participate** in professional development focused on mathematics or mathematics teaching?

○	In the last 12 months	
○	1–3 years ago	
○	4–6 years ago	*Skip to Q23*
○	7–10 years ago	*Skip to Q23*
○	More than 10 years ago	*Skip to Q23*
○	Never	*Skip to Q23*

19. **In the last 3 years,** which of the following types of professional development related to mathematics or mathematics teaching have you had? [Select one on each row.]

		YES	NO
a.	I attended a professional development program/workshop.	○	○
b.	I attended a national, state, or regional mathematics teacher association meeting.	○	○
c.	I completed an online course/webinar.	○	○
d.	I participated in a professional learning community/lesson study/teacher study group.	○	○
e.	I received assistance or feedback from a formally designated coach/mentor.	○	○
f.	I took a formal course for college credit.	○	○

20. What is the **total** amount of time you have spent on professional development related to mathematics or mathematics teaching **in the last 3 years**?

○	Less than 6 hours
○	6–15 hours
○	16–35 hours
○	36–80 hours
○	More than 80 hours

21. Considering all of your mathematics-related professional development **in the last 3 years**, to what extent does each of the following describe your experiences? [Select one on each row.]

	NOT AT ALL		SOMEWHAT		TO A GREAT EXTENT
a. I had opportunities to engage in mathematics investigations.	①	②	③	④	⑤
b. I had opportunities to experience lessons, as my students would, from the textbook/units I use in my classroom.	①	②	③	④	⑤
c. I had opportunities to examine classroom artifacts (for example: student work samples, videos of classroom instruction).	①	②	③	④	⑤
d. I had opportunities to rehearse instructional practices during the professional development (meaning: try out, receive feedback, and reflect on those practices).	①	②	③	④	⑤
e. I had opportunities to apply what I learned to my classroom and then come back and talk about it as part of the professional development.	①	②	③	④	⑤
f. I worked closely with other teachers from my school.	①	②	③	④	⑤
g. I worked closely with other teachers who taught the same grade and/or subject whether or not they were from my school.	①	②	③	④	⑤

22. Thinking about all of your mathematics-related professional development **in the last 3 years**, to what extent was each of the following emphasized? [Select one on each row.]

	NOT AT ALL		SOMEWHAT		TO A GREAT EXTENT
a. Deepening your own mathematics content knowledge	①	②	③	④	⑤
b. Deepening your understanding of how mathematics is done (for example: considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models)	①	②	③	④	⑤
c. Implementing the mathematics textbook to be used in your classroom	①	②	③	④	⑤
d. Learning how to use hands-on activities/manipulatives for mathematics instruction	①	②	③	④	⑤
e. Learning about difficulties that students may have with particular mathematical ideas and procedures	①	②	③	④	⑤
f. Finding out what students think or already know prior to instruction on a topic	①	②	③	④	⑤
g. Monitoring student understanding during mathematics instruction	①	②	③	④	⑤
h. Differentiating mathematics instruction to meet the needs of diverse learners	①	②	③	④	⑤
i. Incorporating students' cultural backgrounds into mathematics instruction	①	②	③	④	⑤
j. Learning how to provide mathematics instruction that integrates engineering, science, and/or computer science	①	②	③	④	⑤

Preparedness to Teach Mathematics

23. *[Presented to self-contained teachers only]*

Many teachers feel better prepared to teach some subject areas than others. How well prepared do you feel to teach each of the following subjects **at the grade level(s) you teach**, whether or not they are currently included in your teaching responsibilities? [Select one on each row.]

	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
a. Number and Operations	①	②	③	④
b. Early Algebra	①	②	③	④
c. Geometry	①	②	③	④
d. Measurement and Data Representation	①	②	③	④
e. Science	①	②	③	④
f. Computer science/Programming	①	②	③	④
g. Reading/Language Arts	①	②	③	④
h. Social Studies	①	②	③	④

24. *[Presented to non-self-contained teachers only]*

Within mathematics, many teachers feel better prepared to teach some topics than others. How prepared do you feel to teach each of the following topics **at the grade level(s) you teach**, whether or not they are currently included in your teaching responsibilities? [Select one on each row.]

	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
a. The number system and operations	①	②	③	④
b. Algebraic thinking	①	②	③	④
c. Functions	①	②	③	④
d. Modeling	①	②	③	④
e. Measurement	①	②	③	④
f. Geometry	①	②	③	④
g. Statistics and probability	①	②	③	④
h. Discrete mathematics	①	②	③	④
i. Computer science/Programming	①	②	③	④

25. How well prepared do you feel to do each of the following in your mathematics instruction? [Select one on each row.]

	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
a. Develop students' conceptual understanding of the mathematical ideas you teach	①	②	③	④
b. Develop students' abilities to do mathematics (for example: consider how to approach a problem, explain and justify solutions, create and use mathematical models)	①	②	③	④
c. Develop students' awareness of STEM careers	①	②	③	④
d. Provide mathematics instruction that is based on students' ideas (whether completely correct or not) about the topics you teach	①	②	③	④
e. Use formative assessment to monitor student learning	①	②	③	④
f. Differentiate mathematics instruction to meet the needs of diverse learners	①	②	③	④
g. Incorporate students' cultural backgrounds into mathematics instruction	①	②	③	④
h. Encourage students' interest in mathematics	①	②	③	④
i. Encourage participation of all students in mathematics	①	②	③	④

Opinions about Mathematics Instruction

26. Please provide your opinion about each of the following statements. [Select one on each row.]

	STRONGLY DISAGREE	DISAGREE	NO OPINION	AGREE	STRONGLY AGREE
a. Students learn mathematics best in classes with students of similar abilities.	①	②	③	④	⑤
b. It is better for mathematics instruction to focus on ideas in depth, even if that means covering fewer topics.	①	②	③	④	⑤
c. At the beginning of instruction on a mathematical idea, students should be provided with definitions for new mathematics vocabulary that will be used.	①	②	③	④	⑤
d. Teachers should explain an idea to students before having them investigate the idea.	①	②	③	④	⑤
e. Most class periods should provide opportunities for students to share their thinking and reasoning.	①	②	③	④	⑤
f. Hands-on activities/manipulatives should be used primarily to reinforce a mathematical idea that the students have already learned.	①	②	③	④	⑤
g. Teachers should ask students to justify their mathematical thinking.	①	②	③	④	⑤
h. Students learn best when instruction is connected to their everyday lives.	①	②	③	④	⑤
i. Most class periods should provide opportunities for students to apply mathematical ideas to real-world contexts.	①	②	③	④	⑤
j. Students should learn mathematics by doing mathematics (for example: considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models).	①	②	③	④	⑤

Leadership Experiences

27. **In the last 3 years** have you… [Select one on each row.]

	YES	NO
a. Served as a lead teacher or department chair in mathematics?	○	○
b. Served as a ***formal*** mentor or coach for a mathematics teacher? (Do not include supervision of student teachers.)	○	○
c. Supervised a student teacher in your classroom?	○	○
d. Served on a school or district/diocese-wide mathematics committee (for example: developing curriculum, developing pacing guides, selecting instructional materials)?	○	○
e. Led or co-led a workshop or professional learning community (for example: teacher study group, lesson study) for other teachers focused on mathematics or mathematics teaching?	○	○
f. Taught a mathematics lesson for other teachers in your school to observe?	○	○
g. Observed another teacher's mathematics lesson for the purpose of giving him/her feedback?	○	○

Your Mathematics Instruction

The rest of this questionnaire is about your *[[x^{th}]]* mathematics class, which you indicated was *[[type indicated in Q10]]* and is titled *[[title provided in Q11]]*. ***[Instructions presented to non-self-contained teachers only]***

The rest of this questionnaire is about your mathematics instruction in this class. ***[Instructions presented to self-contained teachers only]***

28. ***[Presented to non-self-contained teachers only]***
On average, how many minutes per week does this class meet? [Enter your response as a whole number (for example: 300).] __________

29. Enter the number of students for each grade represented in this class. [Enter each response as a whole number (for example: 15).]

Kindergarten	
1st grade	
2nd grade	
3rd grade	
4th grade	
5th grade	
6th grade	
7th grade	
8th grade	
9th grade	
10th grade	
11th grade	
12th grade	

30. For the *[[sum of Q29]]* students in this class, indicate the number of males and females in each of the following categories of race/ethnicity. [Enter each response as a whole number (for example: 15).]

	MALES	FEMALES
a. American Indian or Alaskan Native		
b. Asian		
c. Black or African American		
d. Hispanic or Latino		
e. Native Hawaiian or Other Pacific Islander		
f. White		
g. Two or more races		

31. Which of the following best describes the prior mathematics achievement levels of the students in this class relative to other students in this school?

○	Mostly low achievers
○	Mostly average achievers
○	Mostly high achievers
○	A mixture of levels

32. How much control do you have over each of the following for mathematics instruction in this class? [Select one on each row.]

		NO CONTROL		MODERATE CONTROL		STRONG CONTROL
a.	Determining course goals and objectives	①	②	③	④	⑤
b.	Selecting curriculum materials (for example: textbooks)	①	②	③	④	⑤
c.	Selecting content, topics, and skills to be taught	①	②	③	④	⑤
d.	Selecting the sequence in which topics are covered	①	②	③	④	⑤
e.	Determining the amount of instructional time to spend on each topic	①	②	③	④	⑤
f.	Selecting teaching techniques	①	②	③	④	⑤
g.	Determining the amount of homework to be assigned	①	②	③	④	⑤
h.	Choosing criteria for grading student performance	①	②	③	④	⑤

33. Think about your plans for this class for the entire course/year. By the end of the course/year, how much emphasis will each of the following student objectives receive? [Select one on each row.]

		NONE	MINIMAL EMPHASIS	MODERATE EMPHASIS	HEAVY EMPHASIS
a.	Learning mathematics vocabulary	①	②	③	④
b.	Learning mathematical procedures and/or algorithms	①	②	③	④
c.	Learning to perform computations with speed and accuracy	①	②	③	④
d.	Understanding mathematical ideas	①	②	③	④
e.	Learning how to do mathematics (for example: consider how to approach a problem, explain and justify solutions, create and use mathematical models)	①	②	③	④
f.	Learning about real-life applications of mathematics	①	②	③	④
g.	Increasing students' interest in mathematics	①	②	③	④
h.	Developing students' confidence that they can successfully pursue careers in mathematics	①	②	③	④
i.	Learning test-taking skills/strategies	①	②	③	④

34. How often do **you** do each of the following in your mathematics instruction in this class? [Select one on each row.]

	NEVER	RARELY (FOR EXAMPLE: A FEW TIMES A YEAR)	SOMETIMES (FOR EXAMPLE: ONCE OR TWICE A MONTH)	OFTEN (FOR EXAMPLE: ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL MATHEMATICS LESSONS
a. Explain mathematical ideas to the whole class	①	②	③	④	⑤
b. Engage the whole class in discussions	①	②	③	④	⑤
c. Have students work in small groups	①	②	③	④	⑤
d. Provide manipulatives for students to use in problem-solving/investigations	①	②	③	④	⑤
e. Use flipped instruction (have students watch lectures/demonstrations outside of class to prepare for in-class activities)	①	②	③	④	⑤
f. Have students read from a textbook or other material in class, either aloud or to themselves	①	②	③	④	⑤
g. Have students write their reflections (for example: in their journals, on exit tickets) in class or for homework	①	②	③	④	⑤
h. Focus on literacy skills (for example: informational reading or writing strategies)	①	②	③	④	⑤
i. Have students practice for standardized tests	①	②	③	④	⑤

35. How often do you have **students** do each of the following during mathematics instruction in this class? [Select one on each row.]

	NEVER	RARELY (FOR EXAMPLE: A FEW TIMES A YEAR)	SOMETIMES (FOR EXAMPLE: ONCE OR TWICE A MONTH)	OFTEN (FOR EXAMPLE: ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL MATHEMATICS LESSONS
a. Work on challenging problems that require thinking beyond just applying rules, algorithms, or procedures	①	②	③	④	⑤
b. Figure out what a challenging problem is asking (by talking with their classmates and/or using manipulatives, pictures, diagrams, tables, or equations)	①	②	③	④	⑤
c. Reflect on their solution strategies as they work through a mathematics problem and revise as needed	①	②	③	④	⑤
d. Continue working through a mathematics problem when they reach points of difficulty, challenge, or error	①	②	③	④	⑤
e. Determine whether their answer makes sense (for example: the answer has reasonable magnitude or sign, uses appropriate units, fits the context of the problem)	①	②	③	④	⑤
f. Represent aspects of a problem using mathematical symbols, pictures, diagrams, tables, or objects in order to solve it	①	②	③	④	⑤
g. Provide mathematical reasoning to explain, justify, or prove their thinking	①	②	③	④	⑤
h. Compare and contrast different solution strategies for a mathematics problem in terms of their strengths and limitations (for example: their efficiency, generalizability, interpretability by others)	①	②	③	④	⑤
i. Analyze the mathematical reasoning of others (for example: decide if their reasoning makes sense, identify correct ideas or flaws in their thinking)	①	②	③	④	⑤
j. Pose questions to clarify, challenge, or improve the mathematical reasoning of others	①	②	③	④	⑤

k.	Identify relevant information and relationships that could be used to solve a mathematics problem (for example: quantities and relationships needed to develop an equation that illustrates a situation or determines an outcome)	①	②	③	④	⑤
l.	Develop a mathematical model (meaning, a representation of relevant information and relationships such as an equation, tape diagram, algorithm, or function) to solve a mathematics problem	①	②	③	④	⑤
m.	Determine what tools (for example: pencil and paper, manipulatives, ruler, protractor, calculator, spreadsheet) are appropriate for solving a mathematics problem	①	②	③	④	⑤
n.	Determine what units are appropriate for expressing numerical answers, data, and/or measurements	①	②	③	④	⑤
o.	Discuss how certain terms or phrases may have specific meanings in mathematics that are different from their meaning in everyday language	①	②	③	④	⑤
p.	Identify patterns or characteristics of numbers, diagrams, or graphs that may be helpful in solving a mathematics problem	①	②	③	④	⑤
q.	Work on generating a rule or formula (for example: based on multiple problems, patterns, or repeated calculations)	①	②	③	④	⑤

36. Thinking about your instruction in this class over the entire year, about how often do you have students use coding to develop or revise computer programs as part of your mathematics instruction (for example: use Scratch or Python as part of doing mathematics)?

○	Never
○	Rarely (for example: A few times per year)
○	Sometimes (for example: Once or twice a month)
○	Often (for example: Once or twice a week)
○	All or almost all mathematics lessons

37. In a typical week, how much time outside of this class are students expected to spend on mathematics assignments?

○	None
○	1–15 minutes per week
○	16–30 minutes per week
○	31–60 minutes per week
○	61–90 minutes per week
○	91–120 minutes per week
○	More than 2 hours per week

38. How often are students in this class required to take mathematics tests that you did not choose to administer, for example state assessments or district benchmarks? Do not include Advanced Placement or International Baccalaureate exams or students retaking a test because of failure.

○	Never
○	Once a year
○	Twice a year
○	Three or four times a year
○	Five or more times a year

39. Please indicate the availability of projection devices (for example: Smartboard, document camera, LCD projector) for your mathematics instruction in this class.

○	Always available in your classroom
○	Available upon request
○	Not available

40. Mathematics courses may benefit from the availability of particular resources. Considering what you have available, how adequate is each of the following for teaching this mathematics class? [Select one on each row.]

	NOT ADEQUATE		SOMEWHAT ADEQUATE		ADEQUATE
a. Instructional technology (for example: calculators, computers, probes/sensors)	①	②	③	④	⑤
b. Measurement tools (for example: protractors, rulers)	①	②	③	④	⑤
c. Manipulatives (for example: pattern blocks, algebra tiles)	①	②	③	④	⑤
d. Consumable supplies (for example: graphing paper, batteries)	①	②	③	④	⑤

This item asks about different types of instructional materials; please read the entire list of materials before answering

41. Thinking about your instruction in this class over the entire year, about how often is instruction based on materials from each of the following sources? [Select one on each row.]

	NEVER	RARELY (FOR EXAMPLE: A FEW TIMES A YEAR)	SOMETIMES (FOR EXAMPLE: ONCE OR TWICE A MONTH)	OFTEN (FOR EXAMPLE: ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL MATHEMATICS LESSONS
a. Commercially published textbooks (printed or electronic), including the supplementary materials (for example: worksheets) that accompany the textbooks	①	②	③	④	⑤
b. State, county, or district/diocese-developed units or lessons	①	②	③	④	⑤
c. Online units or courses that students work through at their own pace (for example: i-Ready, Edgenuity)	①	②	③	④	⑤
d. Lessons or resources from websites that have a subscription fee or per lesson cost (for example: BrainPOP, Discovery Ed, Teachers Pay Teachers)	①	②	③	④	⑤
e. Lessons or resources from websites that are free (for example: Khan Academy, Illustrative Math)	①	②	③	④	⑤
f. Units or lessons you created (either by yourself or with others)	①	②	③	④	⑤
g. Units or lessons you collected from any other source (for example: conferences, journals, colleagues, university or museum partners)	①	②	③	④	⑤

42. Does your school/district/diocese designate instructional materials (textbooks, units, or lessons) to be used in this class?

○	Yes
○	No *[Skip to Q44]*

43. Which of the following types of instructional materials does your school/district/diocese designate to be used in this class? [Select all that apply.]

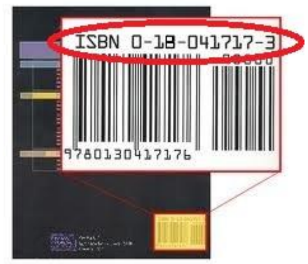
□	Commercially published textbooks (printed or electronic), including the supplementary materials (for example: worksheets) that accompany the textbooks
□	State, county, or district/diocese-developed instructional materials
□	Online units or courses that students work through at their own pace (for example: i-Ready, Edgenuity)
□	Lessons or resources from websites that have a subscription fee or per lesson cost (for example: BrainPOP, Discovery Ed, Teachers Pay Teachers)
□	Lessons or resources from websites that are free (for example: Khan Academy, Illustrative Math)

44. Omitted – Used only for survey routing.

45. ***[Presented only to teachers who selected "Sometimes" "Often" or "All" for Q41a or c]***
[Version for teachers who indicate using a commercial textbook most often] Please indicate the title, author, most recent copyright year, and ISBN code of the commercially published textbook (printed or electronic) used <u>most often</u> by the students in this class.

- The 10- or 13-character ISBN code can be found on the copyright page and/or the back cover of the textbook.
- Do not include the dashes when entering the ISBN.

  Example ISBN:



[Version for teachers who indicate using an online course most often] Please indicate the title and URL of the online units or courses used <u>most often</u> by the students in this class.

Title:	
First Author: [for teachers who indicate using a commercial textbook most often]	
Year: [for teachers who indicate using a commercial textbook most often]	
ISBN: [for teachers who indicate using a commercial textbook most often]	
URL: [for teachers who indicate using an online program most often]	

46. Please rate how each of the following affects your mathematics instruction in this class. [Select one on each row.]

	INHIBITS EFFECTIVE INSTRUCTION		NEUTRAL OR MIXED		PROMOTES EFFECTIVE INSTRUCTION	N/A
a. Current state standards	①	②	③	④	⑤	○
b. District/Diocese and/or school pacing guides	①	②	③	④	⑤	○
c. State/district/diocese testing/accountability policies *[Not presented to non-Catholic private schools]*	①	②	③	④	⑤	○
d. Textbook selection policies	①	②	③	④	⑤	○
e. Teacher evaluation policies	①	②	③	④	⑤	○
f. College entrance requirements *[Presented to grades 9–12 teachers only]*	①	②	③	④	⑤	○
g. Students' prior knowledge and skills	①	②	③	④	⑤	○
h. Students' motivation, interest, and effort in mathematics	①	②	③	④	⑤	○
i. Parent/guardian expectations and involvement	①	②	③	④	⑤	○
j. Principal support	①	②	③	④	⑤	○
k. Amount of time for you to plan, individually and with colleagues	①	②	③	④	⑤	○
l. Amount of time available for your professional development	①	②	③	④	⑤	○
m. Amount of instructional time devoted to mathematics *[Presented to grades K–5 teachers only]*	①	②	③	④	⑤	○

Your Most Recently Completed Mathematics Unit in this Class

The questions in this section are about the most recently completed mathematics unit in this class which you indicated is *[type indicated in Q10]* and is titled *[title provided in Q11]*.

- Depending on the structure of your class and the instructional materials you use, a unit may range from a few to many class periods.
- Do not be concerned if this unit was not typical of your instruction.

47. Which one of the following best describes the content focus of this unit?

○	Number and operations
○	Measurement and data representation
○	Algebra
○	Geometry
○	Probability
○	Statistics
○	Trigonometry
○	Calculus

48. *[Presented only to teachers who selected "Sometimes" "Often" or "All" for Q41 a or b]*
Was this unit based primarily on a commercially published textbook or state, county, or district/diocese-developed materials?

○	Yes
○	No *[Skip to Q53]*

This next set of items is about the textbook or state, county, or district/diocese-developed lessons you used in this unit.

49. Please indicate the extent to which you did each of the following while teaching this unit. [Select one on each row.]

	NOT AT ALL		SOMEWHAT		TO A GREAT EXTENT
a. I used these materials to guide the structure and content emphasis of the unit.	①	②	③	④	⑤
b. I picked what is important from these materials and skipped the rest.	①	②	③	④	⑤
c. I incorporated activities (for example: problems, investigations, readings) from other sources to supplement what these materials were lacking.	①	②	③	④	⑤
d. I modified activities from these materials.	①	②	③	④	⑤

50. *[Presented only to teachers who did not select "Not at all" for Q49b]*
During this unit, when you skipped activities (for example: problems, investigations, readings) in these materials, how much was each of the following a factor in your decisions? [Select one on each row.]

	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
a. The mathematical ideas addressed in the activities I skipped are not included in my pacing guide/standards.	①	②	③
b. I did not have the materials needed to implement the activities I skipped.	①	②	③
c. I did not have the knowledge needed to implement the activities I skipped.	①	②	③
d. The activities I skipped were too difficult for my students.	①	②	③
e. My students already knew the mathematical ideas or were able to learn them without the activities I skipped.	①	②	③
f. I have different activities for those mathematical ideas that work better than the ones I skipped.	①	②	③
g. I did not have enough instructional time for the activities I skipped.	①	②	③

51. *[Presented only to teachers who did not select "Not at all" for Q49c]* During this unit, when you supplemented these materials with additional activities, how much was each of the following a factor in your decisions? [Select one on each row.]

		NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
a.	My pacing guide indicated that I should use supplemental activities.	①	②	③
b.	Supplemental activities were needed to prepare students for standardized tests.	①	②	③
c.	Supplemental activities were needed to provide students with additional practice.	①	②	③
d.	Supplemental activities were needed so students at different levels of achievement could increase their understanding of the ideas targeted in each activity.	①	②	③
e.	I had additional activities that I liked.	①	②	③

52. *[Presented only to teachers who did not select "Not at all" in Q49d]* During this unit, when you modified activities from these materials, how much was each of the following a factor in your decisions? [Select one on each row.]

		NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
a.	I did not have the necessary materials/supplies for the original activities.	①	②	③
b.	The original activities were too difficult conceptually for my students.	①	②	③
c.	The original activities were too easy conceptually for my students.	①	②	③
d.	I did not have enough instructional time to implement the activities as designed.	①	②	③
e.	The original activities were too structured for my students.	①	②	③
f.	The original activities were not structured enough for my students.	①	②	③

53. How well prepared did you feel to do each of the following as part of your instruction on this particular unit? [Select one on each row.]

		NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
a.	Anticipate difficulties that students may have with particular mathematical ideas and procedures in this unit	○	○	○	○
b.	Find out what students thought or already knew about the key mathematical ideas	○	○	○	○
c.	Implement the instructional materials (for example: mathematics textbook) to be used during this unit	○	○	○	○
d.	Monitor student understanding during this unit	○	○	○	○
e.	Assess student understanding at the conclusion of this unit	○	○	○	○

Your Most Recent Mathematics Lesson in this Class

The next three questions refer to the most recent mathematics lesson in this class, which you indicated is *[type indicated in Q10]* and is titled *[title provided in Q11]*, even if it included activities and/or interruptions that are not typical (for example: a test, students working on projects, a fire drill). If the lesson spanned multiple days, please answer for the most recent day.

54. How many minutes was that day's mathematics lesson? Answer for the entire length of the class period, even if there were interruptions. [Enter your response as a non-zero whole number (for example: 50).] ____________________

55. Of these *[answer to Q54]* minutes, how many were spent on the following: [Enter each response as a whole number (for example: 15).]

a.	Non-instructional activities (for example: attendance taking, interruptions)	
b.	Whole class activities (for example: lectures, explanations, discussions)	
c.	Small group work	
d.	Students working individually (for example: reading textbooks, completing worksheets, taking a test or quiz)	

56. Which of the following activities took place during that day's mathematics lesson? [Select all that apply.]

□	Teacher explaining a mathematical idea to the whole class
□	Teacher conducting a demonstration while students watched
□	Whole class discussion
□	Students working in small groups
□	Students completing textbook/worksheet problems
□	Students doing hands-on/manipulative activities
□	Students reading about mathematics
□	Students writing about mathematics (do not include students taking notes)
□	Practicing for standardized tests
□	Test or quiz
□	None of the above

Demographic Information

57. Are you:

○	Female
○	Male
○	Other

58. Are you of Hispanic or Latino origin?

○	Yes
○	No

59. What is your race? [Select all that apply.]

☐	American Indian or Alaskan Native
☐	Asian
☐	Black or African American
☐	Native Hawaiian or Other Pacific Islander
☐	White

60. In what year were you born? [Enter your response as a whole number (for example: 1969).]

____

Thank you!

Mathematics Teacher Questionnaire Tables

Table MTQ 1
Number of Years Mathematics Teachers Spent Teaching Prior to This School Year, by Grade Range

	MEAN NUMBER OF YEARS		
	ELEMENTARY	MIDDLE	HIGH
Any subject at the K–12 level	13 (0.4)	12 (0.4)	13 (0.3)
Mathematics at the K–12 level	12 (0.4)	10 (0.4)	13 (0.3)
At this school, any subject	8 (0.3)	7 (0.3)	8 (0.2)

Table MTQ 2
Grade Levels Taught by Mathematics Teachers

	PERCENT OF TEACHERS
Grades K–5	77 (1.0)
Grades 6–8	14 (0.8)
Grades 9–12	12 (0.6)

Table MTQ 3
Instructional Arrangements for Mathematics in Self-Contained Elementary School Classes

	PERCENT OF TEACHERS
This class receives mathematics instruction only from you.	80 (2.0)
This class receives mathematics instruction from you and other teachers (e.g., a mathematics specialist or a teacher you team with).	20 (2.0)

There is no table for MTQ 4.

Table MTQ 5
Frequency With Which Self-Contained Elementary School Teachers Provide Mathematics Instruction

	PERCENT OF TEACHERS
I teach mathematics all or most days, every week of the year.	99 (0.2)
I teach mathematics every week, but typically three or fewer days each week.	1 (0.2)
I teach mathematics some weeks, but typically not every week.	0 (0.1)

Table MTQ 6
Frequency With Which Self-Contained Elementary School Teachers Provide Science Instruction

	PERCENT OF TEACHERS
I teach science all or most days, every week of the year.	23 (2.1)
I teach science every week, but typically three or fewer days each week.	33 (2.0)
I teach science some weeks, but typically not every week.	37 (2.2)
I do not teach science.	6 (0.9)

Table MTQ 7 and 8
Average Number of Minutes Per Day Spent Teaching Each Subject in Self-Contained Elementary School Classes†

	AVERAGE NUMBER OF MINUTES
Mathematics	60 (1.2)
Science	19 (0.7)
Social Studies	16 (0.5)
Reading/Language Arts	85 (1.9)

† Includes only self-contained elementary teachers who indicated they teach reading/language arts, mathematics, science, and social studies to one class of students.

Table MTQ 9
Number of Sections of Mathematics Classes Taught Per Week, by Grade Range

	PERCENT OF TEACHERS†		
	ELEMENTARY	MIDDLE	HIGH
1 Section	10 (4.3)	4 (0.9)	5 (0.9)
2 Sections	52 (6.5)	14 (1.8)	10 (1.3)
3 Sections	27 (5.5)	20 (1.9)	19 (1.4)
4 Sections	7 (2.4)	23 (2.0)	13 (1.3)
5 Sections	1 (0.6)	23 (2.0)	28 (1.7)
6 Sections	1 (0.6)	13 (1.5)	21 (1.3)
7 Sections	0 ---‡	1 (0.4)	4 (0.6)
8 Sections	0 (0.2)	0 (0.1)	0 (0.1)
9 Sections	0 ---‡	0 (0.2)	0 ---‡
10 Sections	2 (1.5)	0 (0.2)	0 (0.1)

† Includes only teachers of non-self-contained classes.

‡ No mathematics teachers at this grade range in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

There is no table for MTQ 10.

There is no table for MTQ 11.

Table MTQ 12
Subjects of Mathematics Teachers' Degrees, by Grade Range

	PERCENT OF TEACHERS		
	ELEMENTARY	MIDDLE	HIGH
Education (general or subject specific such as mathematics education)	93 (1.2)	82 (1.6)	73 (1.6)
Mathematics	1 (0.4)	26 (2.0)	55 (1.6)
Statistics	0 ---†	1 (0.7)	1 (0.2)
Computer Science	1 (0.3)	3 (0.9)	3 (0.5)
Engineering	0 (0.0)	2 (0.5)	6 (0.8)
Other Subject	36 (2.2)	38 (2.4)	30 (1.5)

† No elementary school mathematics teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table MTQ 13
Mathematics Teachers With Education Degrees, by Grade Range

	PERCENT OF TEACHERS†		
	ELEMENTARY	MIDDLE	HIGH
Elementary Education	88 (1.5)	44 (3.1)	5 (1.2)
Mathematics Education	2 (0.7)	28 (2.4)	53 (2.0)
Science Education	1 (0.5)	4 (1.5)	3 (0.9)
Other Education	20 (1.9)	31 (2.5)	22 (1.9)

† Teachers indicating in Q12 that they do not have an education degree are treated as not having a degree in these areas.

Table MTQ 14
Mathematics College Courses Completed by Mathematics Teachers, by Grade Range

	PERCENT OF TEACHERS		
	ELEMENTARY	MIDDLE	HIGH
Mathematics content for elementary school teachers	92 (1.1)	58 (2.2)	17 (1.4)
Mathematics content for middle school teachers	17 (1.6)	62 (2.6)	46 (1.8)
Mathematics content for high school teachers	1 (0.4)	27 (2.0)	69 (1.9)
Integrated mathematics (a single course that addresses content across multiple mathematics subjects, such as algebra and geometry)	34 (1.6)	50 (2.5)	47 (1.8)
College algebra/trigonometry/functions	49 (2.1)	72 (2.1)	73 (1.4)
Abstract algebra (e.g., groups, rings, ideals, fields) †	n/a	31 (1.7)	73 (1.5)
Linear algebra (e.g., vectors, matrices, eigenvalues) †	n/a	42 (2.0)	84 (1.5)
Calculus	18 (1.4)	65 (2.3)	92 (1.4)
Advanced calculus†	n/a	47 (2.0)	85 (1.4)
Real analysis‡	n/a	19 (1.7)	49 (1.6)
Differential equations†	n/a	36 (1.9)	68 (1.6)
Analytic/Coordinate Geometry (e.g., transformations or isometries, conic sections)†	n/a	33 (2.0)	66 (1.8)
Axiomatic Geometry (Euclidean or non-Euclidean) †	n/a	24 (1.9)	59 (1.9)
College geometry‡	32 (2.1)	n/a	n/a
Probability	25 (1.6)	52 (2.5)	75 (1.3)
Statistics	47 (1.9)	74 (1.9)	89 (1.1)
Number theory (e.g., divisibility theorems, properties of prime numbers) †	n/a	41 (2.4)	58 (1.7)
Discrete mathematics (e.g., combinatorics, graph theory, game theory)	6 (0.8)	31 (2.4)	61 (1.6)
Other upper division mathematics	14 (1.3)	28 (2.2)	58 (1.9)

† This item was presented only to middle and/or high school teachers.

‡ This item was presented only to elementary school teachers.

Table MTQ 15
Mathematics Teachers Having Completed One or More College Courses in Computer Science or Engineering, by Grade Range

	PERCENT OF TEACHERS		
	ELEMENTARY	MIDDLE	HIGH
Computer science	27 (1.7)	42 (2.2)	62 (1.7)
Engineering	2 (0.5)	9 (1.1)	18 (1.3)

Table MTQ 16
Mathematics Teachers' Paths to Certification, by Grade Range

	PERCENT OF TEACHERS		
	ELEMENTARY	MIDDLE	HIGH
An undergraduate program leading to a bachelor's degree and a teaching credential	65 (2.2)	61 (2.6)	57 (2.3)
A post-baccalaureate credentialing program (no master's degree awarded)	10 (1.5)	14 (1.9)	16 (1.2)
A master's program that also led to a teaching credential	23 (2.1)	20 (1.6)	21 (1.6)
I have not completed a program to earn a teaching credential.	2 (0.6)	4 (1.1)	7 (1.5)

Table MTQ 17
Mathematics Teachers With Full-Time Job Experience in a Mathematics-Related Field Prior to Teaching

	PERCENT OF TEACHERS
Elementary	7 (1.1)
Middle	12 (1.4)
High	19 (1.4)

Table MTQ 18
Mathematics Teachers' Most Recent Participation in Mathematics-Focused† Professional Development, by Grade Range

	PERCENT OF TEACHERS		
	ELEMENTARY	MIDDLE	HIGH
In the last 12 months	59 (2.1)	71 (2.5)	68 (1.7)
1–3 years ago	24 (2.0)	19 (2.0)	21 (1.8)
4–6 years ago	7 (1.1)	5 (1.1)	5 (0.9)
7–10 years ago	1 (0.4)	2 (0.6)	1 (0.3)
More than 10 years ago	2 (0.5)	1 (0.3)	2 (0.7)
Never	5 (1.0)	4 (0.8)	3 (0.5)

Table MTQ 19

Mathematics Teachers Participating in Various Mathematics-Focused Professional Development Activities in the Last Three Years, by Grade Range

	PERCENT OF TEACHERS†		
	ELEMENTARY	MIDDLE	HIGH
I attended a professional development program/workshop.	94 (1.1)	93 (1.4)	91 (1.4)
I attended a national, state, or regional mathematics teacher association meeting.	13 (1.7)	26 (2.4)	34 (2.4)
I completed an online course/webinar.	19 (1.5)	35 (2.9)	32 (2.0)
I participated in a professional learning community/lesson study/teacher study group.	53 (2.6)	68 (3.1)	64 (2.1)
I received assistance or feedback from a formally designated coach/mentor.	47 (2.4)	56 (3.2)	44 (2.4)
I took a formal course for college credit.	5 (1.1)	15 (2.1)	19 (1.7)

† Includes only teachers indicating in Q18 that they participated in mathematics-focused professional development in the last three years.

Table MTQ 20

Time Spent by Mathematics Teachers on Mathematics-Focused Professional Development in the Last Three Years, by Grade Range

	PERCENT OF TEACHERS†		
	ELEMENTARY	MIDDLE	HIGH
Less than 6 hours	21 (1.6)	9 (1.8)	8 (1.0)
6–15 hours	37 (2.0)	22 (2.5)	22 (1.6)
16–35 hours	26 (1.9)	27 (1.9)	25 (1.3)
36–80 hours	12 (1.3)	25 (2.0)	27 (1.7)
More than 80 hours	4 (0.7)	16 (1.3)	18 (1.4)

† Includes only teachers indicating in Q18 that they participated in mathematics-focused professional development in the last three years.

Table MTQ 21.1
Elementary School Mathematics Teachers' Descriptions of Mathematics-Focused Professional Development in the Last Three Years

	PERCENT OF TEACHERS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
I had opportunities to engage in mathematics investigations.	10 (1.5)	9 (1.4)	35 (2.5)	34 (2.5)	13 (2.0)
I had opportunities to experience lessons, as my students would, from the textbook/units I use in my classroom.	13 (1.6)	12 (1.5)	27 (2.4)	32 (2.3)	16 (1.8)
I had opportunities to examine classroom artifacts (e.g., student work samples, videos of classroom instruction).	11 (1.5)	14 (1.9)	28 (2.2)	31 (2.4)	14 (2.1)
I had opportunities to rehearse instructional practices during the professional development (i.e., try out, receive feedback, and reflect on those practices).	22 (2.1)	18 (1.6)	25 (2.1)	26 (1.9)	9 (1.5)
I had opportunities to apply what I learned to my classroom and then come back and talk about it as part of the professional development.	17 (1.9)	14 (1.9)	25 (2.4)	29 (2.0)	15 (2.0)
I worked closely with other teachers from my school.	5 (1.0)	7 (1.3)	19 (2.0)	32 (2.1)	36 (2.6)
I worked closely with other teachers who taught the same grade and/or subject whether or not they were from my school.	9 (1.4)	13 (1.5)	21 (1.8)	33 (2.2)	23 (2.3)

† Includes only elementary school mathematics teachers indicating in Q18 that they participated in mathematics-focused professional development in the last three years.

Table MTQ 21.2
Middle School Mathematics Teachers' Descriptions of Mathematics-Focused Professional Development in the Last Three Years

	PERCENT OF TEACHERS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
I had opportunities to engage in mathematics investigations.	13 (2.9)	5 (0.7)	35 (3.0)	32 (2.4)	15 (1.5)
I had opportunities to experience lessons, as my students would, from the textbook/units I use in my classroom.	16 (2.4)	12 (1.6)	27 (2.9)	31 (3.5)	14 (1.7)
I had opportunities to examine classroom artifacts (e.g., student work samples, videos of classroom instruction).	7 (1.4)	12 (1.9)	32 (2.9)	32 (3.3)	16 (2.3)
I had opportunities to rehearse instructional practices during the professional development (i.e., try out, receive feedback, and reflect on those practices).	21 (2.8)	19 (2.2)	26 (2.5)	25 (3.0)	9 (1.5)
I had opportunities to apply what I learned to my classroom and then come back and talk about it as part of the professional development.	16 (2.6)	13 (1.9)	25 (2.7)	31 (3.2)	15 (1.6)
I worked closely with other teachers from my school.	3 (1.4)	7 (1.6)	18 (2.4)	29 (3.3)	43 (3.1)
I worked closely with other teachers who taught the same grade and/or subject whether or not they were from my school.	8 (2.1)	10 (2.1)	23 (2.4)	28 (3.1)	31 (2.7)

† Includes only middle school mathematics teachers indicating in Q18 that they participated in mathematics-focused professional development in the last three years.

Table MTQ 21.3
High School Mathematics Teachers' Descriptions of Mathematics-Focused Professional Development in the Last Three Years

	PERCENT OF TEACHERS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
I had opportunities to engage in mathematics investigations.	9 (0.8)	8 (1.4)	40 (2.2)	26 (1.8)	17 (1.3)
I had opportunities to experience lessons, as my students would, from the textbook/units I use in my classroom.	19 (1.9)	13 (1.4)	26 (2.0)	26 (2.1)	16 (1.7)
I had opportunities to examine classroom artifacts (e.g., student work samples, videos of classroom instruction).	10 (1.1)	16 (1.6)	31 (1.9)	29 (2.0)	15 (1.6)
I had opportunities to rehearse instructional practices during the professional development (i.e., try out, receive feedback, and reflect on those practices).	23 (1.7)	21 (1.7)	25 (1.9)	20 (2.1)	11 (1.5)
I had opportunities to apply what I learned to my classroom and then come back and talk about it as part of the professional development.	15 (1.4)	16 (1.5)	24 (1.5)	28 (2.2)	18 (1.5)
I worked closely with other teachers from my school.	6 (0.9)	8 (1.2)	19 (1.7)	27 (1.7)	40 (2.4)
I worked closely with other teachers who taught the same grade and/or subject whether or not they were from my school.	7 (1.0)	11 (1.2)	25 (1.4)	30 (2.0)	28 (1.5)

† Includes only high school mathematics teachers indicating in Q18 that they participated in mathematics-focused professional development in the last three years.

Table MTQ 22.1
Elementary School Mathematics Teachers' Perceptions of Topics Emphasized During Professional Development in the Last Three Years

	PERCENT OF TEACHERS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
Deepening your own mathematics content knowledge	7 (1.1)	12 (1.5)	30 (2.2)	30 (2.3)	21 (1.8)
Deepening your understanding of how mathematics is done (e.g., considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models)	3 (1.0)	9 (1.4)	30 (2.1)	38 (2.5)	20 (1.8)
Implementing the mathematics textbook to be used in your classroom	23 (1.9)	14 (1.5)	23 (2.2)	24 (2.2)	16 (1.8)
Learning how to use hands-on activities/manipulatives for mathematics instruction	5 (1.3)	11 (1.5)	24 (2.2)	34 (2.2)	25 (1.8)
Learning about difficulties that students may have with particular mathematical ideas and procedures	6 (1.2)	19 (2.1)	27 (2.3)	34 (2.2)	13 (1.5)
Finding out what students think or already know prior to instruction on a topic	8 (1.4)	17 (1.9)	29 (2.0)	33 (2.4)	13 (1.7)
Monitoring student understanding during mathematics instruction	5 (1.2)	9 (1.6)	30 (1.9)	36 (2.3)	20 (1.8)
Differentiating mathematics instruction to meet the needs of diverse learners	4 (1.0)	11 (1.5)	30 (2.5)	34 (2.4)	22 (2.3)
Incorporating students' cultural backgrounds into mathematics instruction	31 (2.4)	22 (2.1)	28 (2.4)	14 (1.5)	6 (1.4)
Learning how to provide mathematics instruction that integrates engineering, science, and/or computer science	28 (2.3)	25 (2.1)	25 (2.1)	15 (2.0)	7 (1.1)

† Includes only elementary school mathematics teachers indicating in Q18 that they participated in mathematics-focused professional development in the last three years.

Table MTQ 22.2
Middle School Mathematics Teachers' Perceptions of Topics Emphasized During Professional Development in the Last Three Years

	PERCENT OF TEACHERS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
Deepening your own mathematics content knowledge	9 (1.6)	13 (1.4)	35 (3.4)	27 (3.0)	17 (1.9)
Deepening your understanding of how mathematics is done (e.g., considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models)	4 (1.0)	12 (1.6)	29 (3.0)	37 (3.4)	19 (2.4)
Implementing the mathematics textbook to be used in your classroom	25 (2.9)	17 (2.4)	19 (2.6)	23 (2.8)	16 (2.0)
Learning how to use hands-on activities/manipulatives for mathematics instruction	7 (1.5)	13 (1.7)	35 (3.3)	31 (3.1)	14 (1.6)
Learning about difficulties that students may have with particular mathematical ideas and procedures	7 (1.6)	12 (1.8)	30 (2.7)	37 (2.9)	14 (1.9)
Finding out what students think or already know prior to instruction on a topic	12 (2.0)	14 (2.0)	35 (3.0)	28 (3.1)	11 (1.6)
Monitoring student understanding during mathematics instruction	8 (1.7)	13 (1.8)	24 (2.1)	37 (3.1)	18 (2.4)
Differentiating mathematics instruction to meet the needs of diverse learners	6 (1.3)	9 (1.1)	30 (2.7)	37 (3.3)	18 (2.4)
Incorporating students' cultural backgrounds into mathematics instruction	25 (2.8)	25 (2.5)	30 (2.7)	14 (2.9)	5 (1.0)
Learning how to provide mathematics instruction that integrates engineering, science, and/or computer science	30 (2.9)	25 (2.2)	26 (2.5)	14 (2.8)	6 (1.4)

† Includes only middle school mathematics teachers indicating in Q18 that they participated in mathematics-focused professional development in the last three years.

Table MTQ 22.3
High School Mathematics Teachers' Perceptions of Topics Emphasized During Professional Development in the Last Three Years

	PERCENT OF TEACHERS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
Deepening your own mathematics content knowledge	14 (1.5)	17 (1.7)	30 (2.3)	24 (2.0)	15 (1.4)
Deepening your understanding of how mathematics is done (e.g., considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models)	7 (1.2)	12 (1.1)	32 (2.4)	32 (2.0)	17 (1.5)
Implementing the mathematics textbook to be used in your classroom	34 (2.3)	19 (1.6)	22 (2.1)	17 (2.1)	8 (0.9)
Learning how to use hands-on activities/manipulatives for mathematics instruction	10 (1.5)	16 (1.5)	34 (2.1)	26 (1.6)	13 (1.8)
Learning about difficulties that students may have with particular mathematical ideas and procedures	7 (1.0)	15 (1.5)	32 (1.8)	34 (2.2)	11 (1.5)
Finding out what students think or already know prior to instruction on a topic	9 (1.1)	20 (1.4)	33 (2.0)	28 (2.1)	10 (1.4)
Monitoring student understanding during mathematics instruction	8 (1.0)	13 (1.0)	27 (1.7)	36 (2.3)	17 (1.4)
Differentiating mathematics instruction to meet the needs of diverse learners	4 (0.7)	12 (1.3)	31 (1.7)	35 (1.9)	18 (1.9)
Incorporating students' cultural backgrounds into mathematics instruction	25 (1.6)	22 (1.6)	27 (2.3)	17 (1.5)	8 (1.8)
Learning how to provide mathematics instruction that integrates engineering, science, and/or computer science	28 (1.9)	22 (1.3)	29 (2.2)	14 (1.2)	8 (1.7)

† Includes only high school mathematics teachers indicating in Q18 that they participated in mathematics-focused professional development in the last three years.

Table MTQ 23
Self-Contained Elementary School Mathematics Teachers' Perceptions of Their Preparedness to Teach Various Subjects

	PERCENT OF TEACHERS†			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
Number and Operations	0 (0.1)	2 (0.5)	23 (1.7)	74 (1.7)
Early Algebra	6 (0.9)	17 (1.2)	36 (2.1)	41 (1.9)
Geometry	4 (0.7)	12 (1.3)	35 (1.8)	49 (2.2)
Measurement and Data Representation	3 (0.5)	8 (1.1)	37 (1.8)	53 (1.8)
Science	4 (0.8)	23 (1.8)	42 (1.9)	31 (1.9)
Computer science/Programming	47 (2.4)	34 (2.0)	13 (1.3)	6 (0.9)
Reading/Language Arts	1 (0.2)	3 (0.8)	22 (1.6)	75 (1.9)
Social Studies	3 (0.7)	17 (1.3)	36 (1.7)	44 (1.6)

† Includes only self-contained elementary school teachers who indicated they teach reading/language arts, mathematics, science, and social studies to one class of students.

Table MTQ 24.1
Non-Self-Contained Elementary School Mathematics Teachers' Perceptions of Their Preparedness to Teach Various Topics

	PERCENT OF TEACHERS			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
The number system and operations	0 ---†	1 (1.4)	16 (3.8)	83 (3.5)
Algebraic thinking	0 ---†	6 (3.3)	35 (4.6)	59 (4.9)
Functions	12 (4.0)	27 (5.3)	32 (5.1)	28 (4.8)
Modeling	0 ---†	9 (2.8)	22 (4.4)	68 (5.5)
Measurement	0 ---†	2 (1.5)	39 (5.4)	59 (5.6)
Geometry	0 ---†	3 (1.4)	30 (5.8)	67 (5.9)
Statistics and probability	11 (3.4)	34 (5.7)	33 (4.3)	22 (4.8)
Discrete mathematics	26 (4.5)	36 (5.4)	29 (5.5)	9 (3.7)
Computer science/Programming	48 (4.9)	33 (5.1)	10 (4.0)	8 (3.1)

† No non-self-contained elementary mathematics teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table MTQ 24.2
Middle School Mathematics Teachers' Perceptions of Their Preparedness to Teach Various Topics

	PERCENT OF TEACHERS			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
The number system and operations	0 ---†	2 (0.9)	13 (1.2)	85 (1.4)
Algebraic thinking	0 ---†	3 (1.1)	18 (1.5)	78 (1.7)
Functions	3 (0.6)	12 (1.4)	28 (1.9)	57 (2.0)
Modeling	2 (0.4)	13 (1.6)	39 (2.4)	46 (2.4)
Measurement	1 (0.2)	8 (1.3)	31 (1.8)	61 (2.0)
Geometry	2 (0.7)	7 (1.1)	32 (2.1)	59 (2.3)
Statistics and probability	3 (1.0)	17 (1.7)	41 (2.5)	40 (2.4)
Discrete mathematics	28 (2.0)	34 (2.2)	25 (1.8)	12 (1.4)
Computer science/Programming	59 (2.3)	26 (2.2)	11 (1.5)	4 (0.7)

† No middle school mathematics teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table MTQ 24.3
High School Mathematics Teachers' Perceptions of Their Preparedness to Teach Various Topics

	PERCENT OF TEACHERS			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
The number system and operations	0 (0.1)	1 (0.4)	9 (0.9)	89 (0.9)
Algebraic thinking	0 (0.1)	2 (0.4)	9 (0.7)	89 (0.9)
Functions	0 (0.1)	3 (0.8)	12 (1.4)	84 (1.4)
Modeling	1 (0.2)	10 (0.9)	31 (1.7)	59 (1.8)
Measurement	1 (0.2)	5 (0.6)	21 (1.3)	74 (1.3)
Geometry	1 (0.3)	11 (0.9)	22 (1.2)	65 (1.4)
Statistics and probability	7 (0.8)	25 (1.3)	37 (1.6)	31 (1.7)
Discrete mathematics	17 (1.2)	30 (1.5)	32 (1.7)	21 (1.3)
Computer science/Programming	56 (1.6)	29 (1.6)	10 (1.0)	5 (0.8)

Table MTQ 25.1
Elementary School Mathematics Teachers' Perceptions of Their Preparedness for Each of a Number of Tasks

	PERCENT OF TEACHERS			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
Develop students' conceptual understanding of the mathematical ideas you teach	0 (0.2)	8 (0.9)	46 (1.6)	46 (1.6)
Develop students' abilities to do mathematics (e.g., consider how to approach a problem, explain and justify solutions, create and use mathematical models)	0 (0.2)	8 (1.1)	46 (1.7)	46 (1.7)
Develop students' awareness of STEM careers	23 (1.4)	42 (1.7)	27 (1.7)	8 (1.0)
Provide mathematics instruction that is based on students' ideas (whether completely correct or not) about the topics you teach	9 (1.2)	29 (1.8)	42 (2.0)	19 (1.6)
Use formative assessment to monitor student learning	1 (0.3)	8 (1.1)	38 (1.6)	53 (1.7)
Differentiate mathematics instruction to meet the needs of diverse learners	1 (0.4)	14 (1.6)	44 (1.8)	41 (1.9)
Incorporate students' cultural backgrounds into mathematics instruction	19 (1.4)	33 (1.9)	33 (1.8)	15 (1.5)
Encourage students' interest in mathematics	2 (0.5)	12 (1.4)	44 (2.0)	42 (1.9)
Encourage participation of all students in mathematics	0 (0.2)	6 (1.0)	38 (1.7)	56 (1.6)

Table MTQ 25.2
Middle School Mathematics Teachers' Perceptions of Their Preparedness for Each of a Number of Tasks

	PERCENT OF TEACHERS			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
Develop students' conceptual understanding of the mathematical ideas you teach	0 (0.2)	7 (1.3)	44 (2.2)	49 (2.2)
Develop students' abilities to do mathematics (e.g., consider how to approach a problem, explain and justify solutions, create and use mathematical models)	0 ---†	7 (1.3)	39 (2.0)	55 (2.1)
Develop students' awareness of STEM careers	19 (1.8)	42 (2.3)	29 (2.1)	10 (0.9)
Provide mathematics instruction that is based on students' ideas (whether completely correct or not) about the topics you teach	5 (0.9)	29 (2.1)	43 (2.1)	23 (1.7)
Use formative assessment to monitor student learning	0 (0.1)	8 (1.4)	34 (2.4)	57 (2.2)
Differentiate mathematics instruction to meet the needs of diverse learners	1 (0.5)	18 (2.0)	45 (2.6)	36 (2.2)
Incorporate students' cultural backgrounds into mathematics instruction	13 (1.3)	43 (2.3)	31 (1.9)	13 (1.1)
Encourage students' interest in mathematics	1 (0.4)	18 (2.3)	44 (2.2)	37 (2.0)
Encourage participation of all students in mathematics	0 (0.2)	11 (1.6)	40 (2.1)	49 (2.1)

† No middle school mathematics teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table MTQ 25.3
High School Mathematics Teachers' Perceptions of Their Preparedness for Each of a Number of Tasks

	PERCENT OF TEACHERS			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
Develop students' conceptual understanding of the mathematical ideas you teach	0 (0.1)	7 (1.5)	32 (1.3)	61 (1.8)
Develop students' abilities to do mathematics (e.g., consider how to approach a problem, explain and justify solutions, create and use mathematical models)	0 (0.2)	5 (1.0)	28 (1.8)	66 (2.0)
Develop students' awareness of STEM careers	13 (1.1)	39 (1.6)	33 (1.7)	15 (1.1)
Provide mathematics instruction that is based on students' ideas (whether completely correct or not) about the topics you teach	6 (0.6)	26 (1.4)	42 (1.7)	26 (1.5)
Use formative assessment to monitor student learning	1 (0.2)	6 (0.8)	36 (1.6)	57 (1.6)
Differentiate mathematics instruction to meet the needs of diverse learners	3 (0.7)	17 (1.1)	47 (1.4)	33 (1.6)
Incorporate students' cultural backgrounds into mathematics instruction	17 (1.0)	37 (1.4)	29 (1.4)	17 (1.3)
Encourage students' interest in mathematics	1 (0.3)	13 (1.1)	48 (1.6)	38 (1.5)
Encourage participation of all students in mathematics	1 (0.2)	9 (1.1)	43 (1.8)	46 (1.8)

Table MTQ 26.1
Elementary School Mathematics
Teachers' Opinions About Teaching and Learning

	PERCENT OF TEACHERS				
	STRONGLY DISAGREE	DISAGREE	NO OPINION	AGREE	STRONGLY AGREE
Students learn mathematics best in classes with students of similar abilities.	4 (0.8)	35 (2.0)	13 (1.7)	39 (2.1)	9 (1.4)
It is better for mathematics instruction to focus on ideas in depth, even if that means covering fewer topics.	1 (0.4)	10 (1.4)	12 (1.4)	52 (2.3)	25 (1.9)
At the beginning of instruction on a mathematical idea, students should be provided with definitions for new mathematics vocabulary that will be used.	1 (0.5)	9 (1.2)	8 (1.2)	50 (2.3)	32 (2.0)
Teachers should explain an idea to students before having them investigate the idea.	4 (0.8)	40 (2.0)	22 (1.8)	26 (1.9)	9 (1.3)
Most class periods should provide opportunities for students to share their thinking and reasoning.	1 (0.4)	1 (0.5)	2 (0.6)	40 (2.3)	55 (2.3)
Hands-on activities/manipulatives should be used primarily to reinforce a mathematical idea that the students have already learned.	7 (1.2)	33 (2.1)	7 (1.1)	25 (1.8)	28 (2.2)
Teachers should ask students to justify their mathematical thinking.	1 (0.4)	1 (0.5)	1 (0.4)	37 (2.2)	60 (2.1)
Students learn best when instruction is connected to their everyday lives.	1 (0.4)	1 (0.2)	2 (0.5)	40 (2.1)	57 (2.1)
Most class periods should provide opportunities for students to apply mathematical ideas to real-world contexts.	0 ---†	2 (0.6)	5 (1.0)	46 (2.2)	47 (2.2)
Students should learn mathematics by doing mathematics (e.g., considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models).	0 (0.3)	1 (0.3)	2 (0.6)	43 (2.2)	54 (2.2)

† No elementary school mathematics teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table MTQ 26.2
Middle School Mathematics
Teachers' Opinions About Teaching and Learning

	PERCENT OF TEACHERS				
	STRONGLY DISAGREE	DISAGREE	NO OPINION	AGREE	STRONGLY AGREE
Students learn mathematics best in classes with students of similar abilities.	1 (0.7)	23 (2.3)	9 (1.3)	45 (2.8)	22 (2.5)
It is better for mathematics instruction to focus on ideas in depth, even if that means covering fewer topics.	0 ---†	5 (1.0)	6 (1.0)	54 (2.6)	35 (2.4)
At the beginning of instruction on a mathematical idea, students should be provided with definitions for new mathematics vocabulary that will be used.	0 (0.2)	11 (2.0)	11 (1.8)	48 (2.9)	30 (2.3)
Teachers should explain an idea to students before having them investigate the idea.	6 (0.9)	45 (3.1)	19 (1.9)	23 (2.8)	8 (1.6)
Most class periods should provide opportunities for students to share their thinking and reasoning.	0 ---†	1 (0.4)	3 (0.6)	50 (2.8)	46 (2.8)
Hands-on activities/manipulatives should be used primarily to reinforce a mathematical idea that the students have already learned.	5 (1.4)	33 (2.5)	19 (2.6)	31 (2.5)	12 (1.6)
Teachers should ask students to justify their mathematical thinking.	0 ---†	0 (0.2)	1 (0.3)	36 (2.8)	63 (2.9)
Students learn best when instruction is connected to their everyday lives.	0 ---†	1 (0.4)	6 (1.8)	42 (2.6)	50 (2.8)
Most class periods should provide opportunities for students to apply mathematical ideas to real-world contexts.	0 (0.2)	1 (0.4)	6 (1.0)	52 (2.8)	40 (2.7)
Students should learn mathematics by doing mathematics (e.g., considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models).	0 ---†	1 (0.3)	2 (0.6)	39 (2.6)	58 (2.6)

† No middle school mathematics teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table MTQ 26.3
High School Mathematics
Teachers' Opinions About Teaching and Learning

	PERCENT OF TEACHERS				
	STRONGLY DISAGREE	DISAGREE	NO OPINION	AGREE	STRONGLY AGREE
Students learn mathematics best in classes with students of similar abilities.	1 (0.4)	20 (1.8)	8 (1.0)	49 (2.0)	22 (1.7)
It is better for mathematics instruction to focus on ideas in depth, even if that means covering fewer topics.	0 (0.1)	7 (1.5)	9 (1.2)	54 (1.9)	29 (1.6)
At the beginning of instruction on a mathematical idea, students should be provided with definitions for new mathematics vocabulary that will be used.	1 (0.8)	8 (0.9)	12 (1.2)	46 (2.3)	32 (2.3)
Teachers should explain an idea to students before having them investigate the idea.	6 (0.9)	40 (2.1)	22 (1.7)	23 (1.8)	9 (1.3)
Most class periods should provide opportunities for students to share their thinking and reasoning.	0 (0.1)	2 (0.5)	4 (0.7)	55 (2.0)	39 (2.0)
Hands-on activities/manipulatives should be used primarily to reinforce a mathematical idea that the students have already learned.	3 (0.7)	32 (1.6)	21 (1.5)	32 (1.9)	12 (1.8)
Teachers should ask students to justify their mathematical thinking.	0 ---†	0 (0.4)	2 (0.5)	39 (2.5)	59 (2.5)
Students learn best when instruction is connected to their everyday lives.	1 (0.8)	5 (1.1)	9 (1.0)	50 (2.1)	35 (1.9)
Most class periods should provide opportunities for students to apply mathematical ideas to real-world contexts.	0 (0.1)	9 (1.3)	13 (1.2)	52 (2.1)	26 (1.9)
Students should learn mathematics by doing mathematics (e.g., considering how to approach a problem, explaining and justifying solutions, creating and using mathematical models).	0 ---†	0 (0.1)	4 (0.8)	44 (1.9)	52 (1.8)

† No high school mathematics teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table MTQ 27
Mathematics Teachers Having Various Leadership Responsibilities Within the Last Three Years, by Grade Range

	PERCENT OF TEACHERS		
	ELEMENTARY	MIDDLE	HIGH
Served as a lead teacher or department chair in mathematics	14 (1.6)	31 (2.3)	28 (1.8)
Served as a formal mentor or coach for a mathematics teacher	6 (1.2)	21 (1.9)	29 (2.0)
Supervised a student teacher in your classroom	27 (2.2)	21 (2.1)	20 (1.8)
Served on a school district-wide/diocese-wide mathematics committee (e.g., developing curriculum, developing pacing guides, selecting instructional materials)	21 (1.6)	45 (2.9)	49 (2.1)
Led or co-led a workshop or professional learning community (e.g., teacher study group, lesson study) for other teachers focused on mathematics or mathematics teaching	10 (1.2)	23 (2.2)	26 (1.8)
Taught a mathematics lesson for other teachers in your school to observe	28 (1.7)	43 (2.9)	41 (2.4)
Observed another teacher's mathematics lesson for the purpose of giving him/her feedback	27 (1.9)	47 (3.0)	53 (2.0)

Table MTQ 28
Average Minutes Per Week Mathematics Classes† Meet

	AVERAGE NUMBER OF MINUTES
Elementary	358 (21.3)
Middle	265 (4.4)
High	254 (3.0)

† Includes only non-self-contained classes.

Table MTQ 29
Average Number of Students in Mathematics Classes

	AVERAGE NUMBER OF STUDENTS
Elementary	21 (0.2)
Middle	22 (0.4)
High	21 (0.3)

Table MTQ 30
Race/Ethnicity of Students in Mathematics Classes, by Grade Range

	AVERAGE PERCENT OF STUDENTS		
	ELEMENTARY	MIDDLE	HIGH
American Indian or Alaskan Native	2 (0.5)	2 (0.4)	2 (0.7)
Asian	4 (0.7)	4 (0.4)	5 (0.5)
Black or African American	18 (1.4)	16 (1.3)	13 (0.8)
Hispanic/Latino	19 (1.3)	23 (1.5)	20 (1.4)
Native Hawaiian or Other Pacific Islander	1 (0.2)	0 (0.1)	1 (0.1)
White	52 (1.6)	53 (2.0)	57 (1.6)
Two or more races	5 (0.4)	3 (0.3)	3 (0.3)

Table MTQ 31
Prior Mathematics Achievement Level of Students in Mathematics Classes, by Grade Range

	PERCENT OF CLASSES		
	ELEMENTARY	MIDDLE	HIGH
Mostly low achievers	12 (1.4)	26 (1.8)	22 (1.4)
Mostly average achievers	30 (1.5)	24 (1.7)	28 (1.6)
Mostly high achievers	7 (1.0)	22 (1.8)	27 (1.3)
A mixture of levels	51 (1.8)	29 (2.0)	24 (1.6)

Table MTQ 32.1
Elementary School Mathematics Classes in Which Teachers Report Having Control Over Various Curricular and Instructional Decisions

	PERCENT OF CLASSES				
	NO CONTROL 1	2	MODERATE CONTROL 3	4	STRONG CONTROL 5
Determining course goals and objectives	34 (2.3)	16 (1.8)	21 (1.8)	13 (1.6)	16 (1.7)
Selecting curriculum materials (e.g., textbooks)	33 (2.3)	24 (2.1)	20 (1.7)	12 (1.5)	11 (1.5)
Selecting content, topics, and skills to be taught	40 (2.6)	20 (1.9)	16 (1.9)	12 (1.7)	11 (1.3)
Selecting the sequence in which topics are covered	25 (2.1)	18 (1.8)	22 (1.6)	16 (1.7)	19 (1.7)
Determining the amount of instructional time to spend on each topic	17 (1.7)	14 (1.5)	26 (1.8)	22 (1.8)	21 (1.8)
Selecting teaching techniques	2 (0.6)	4 (0.9)	13 (1.5)	29 (2.1)	52 (2.2)
Determining the amount of homework to be assigned	3 (1.0)	3 (0.9)	10 (1.3)	23 (2.0)	61 (2.2)
Choosing criteria for grading student performance	6 (1.2)	9 (1.3)	27 (2.4)	25 (2.0)	34 (2.0)

Table MTQ 32.2
Middle School Mathematics Classes in Which Teachers Report Having Control Over Various Curricular and Instructional Decisions

	PERCENT OF CLASSES				
	NO CONTROL 1	2	MODERATE CONTROL 3	4	STRONG CONTROL 5
Determining course goals and objectives	26 (2.2)	13 (1.3)	20 (2.3)	14 (1.6)	28 (2.4)
Selecting curriculum materials (e.g., textbooks)	27 (2.2)	17 (2.1)	23 (2.1)	15 (2.0)	18 (2.1)
Selecting content, topics, and skills to be taught	31 (2.0)	17 (1.8)	17 (1.8)	14 (1.9)	21 (2.1)
Selecting the sequence in which topics are covered	12 (1.4)	16 (1.8)	22 (2.4)	18 (1.7)	31 (2.6)
Determining the amount of instructional time to spend on each topic	6 (0.9)	12 (1.8)	23 (2.1)	21 (2.1)	37 (2.7)
Selecting teaching techniques	0 (0.0)	2 (0.5)	8 (1.5)	23 (2.2)	68 (2.5)
Determining the amount of homework to be assigned	1 (0.4)	1 (0.4)	9 (1.5)	18 (2.2)	71 (2.4)
Choosing criteria for grading student performance	2 (0.7)	5 (1.3)	18 (2.0)	22 (2.2)	52 (2.9)

Table MTQ 32.3
High School Mathematics Classes in Which Teachers Report Having Control Over Various Curricular and Instructional Decisions

	PERCENT OF CLASSES				
	NO CONTROL 1	2	MODERATE CONTROL 3	4	STRONG CONTROL 5
Determining course goals and objectives	14 (1.4)	13 (1.3)	24 (1.6)	19 (1.4)	30 (1.6)
Selecting curriculum materials (e.g., textbooks)	20 (1.8)	13 (1.4)	24 (1.6)	16 (1.5)	27 (1.8)
Selecting content, topics, and skills to be taught	17 (1.8)	15 (1.5)	23 (1.7)	19 (1.9)	26 (1.6)
Selecting the sequence in which topics are covered	8 (1.2)	10 (1.3)	18 (1.4)	18 (1.5)	45 (1.7)
Determining the amount of instructional time to spend on each topic	3 (0.5)	8 (1.1)	20 (1.6)	21 (1.6)	49 (2.0)
Selecting teaching techniques	0 (0.2)	1 (0.3)	7 (1.2)	21 (1.6)	71 (1.5)
Determining the amount of homework to be assigned	2 (0.6)	1 (0.4)	7 (1.2)	15 (1.3)	75 (1.6)
Choosing criteria for grading student performance	3 (0.6)	5 (1.2)	14 (1.5)	24 (1.6)	53 (2.0)

Table MTQ 33.1
Emphasis Given in Elementary School Mathematics Classes to Various Instructional Objectives

	PERCENT OF CLASSES			
	NONE	MINIMAL EMPHASIS	MODERATE EMPHASIS	HEAVY EMPHASIS
Learning mathematics vocabulary	0 (0.1)	8 (0.9)	56 (1.8)	36 (1.7)
Learning mathematical procedures and/or algorithms	1 (0.3)	8 (0.9)	39 (1.5)	52 (1.7)
Learning to perform computations with speed and accuracy	2 (0.6)	17 (1.4)	49 (2.0)	33 (2.1)
Understanding mathematical ideas	0 ---†	2 (0.5)	31 (1.6)	67 (1.7)
Learning how to do mathematics (e.g., consider how to approach a problem, explain and justify solutions, create and use mathematical models)	0 (0.1)	4 (0.7)	34 (1.8)	62 (1.9)
Learning about real-life applications of mathematics	1 (0.3)	13 (1.4)	53 (2.0)	34 (1.9)
Increasing students' interest in mathematics	1 (0.3)	11 (1.2)	47 (2.0)	41 (1.9)
Developing students' confidence that they can successfully pursue careers in mathematics	3 (0.6)	20 (1.6)	39 (1.8)	37 (1.7)
Learning test-taking skills/strategies	4 (0.7)	25 (1.6)	41 (1.4)	30 (1.8)

† No elementary school mathematics teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table MTQ 33.2
Emphasis Given in Middle School Mathematics Classes to Various Instructional Objectives

	PERCENT OF CLASSES			
	NONE	MINIMAL EMPHASIS	MODERATE EMPHASIS	HEAVY EMPHASIS
Learning mathematics vocabulary	0 (0.1)	12 (1.3)	61 (2.1)	27 (1.9)
Learning mathematical procedures and/or algorithms	0 (0.0)	5 (0.8)	42 (2.4)	53 (2.6)
Learning to perform computations with speed and accuracy	1 (0.4)	28 (1.9)	51 (2.2)	20 (1.6)
Understanding mathematical ideas	0 ---†	2 (0.8)	27 (1.9)	71 (1.9)
Learning how to do mathematics (e.g., consider how to approach a problem, explain and justify solutions, create and use mathematical models)	0 (0.1)	3 (0.6)	36 (2.1)	61 (2.1)
Learning about real-life applications of mathematics	0 (0.1)	12 (1.6)	50 (2.2)	37 (1.9)
Increasing students' interest in mathematics	0 (0.1)	17 (1.6)	49 (2.1)	34 (2.0)
Developing students' confidence that they can successfully pursue careers in mathematics	1 (0.3)	15 (1.7)	43 (2.2)	41 (2.0)
Learning test-taking skills/strategies	1 (0.2)	30 (2.2)	47 (2.4)	23 (1.5)

† No middle school mathematics teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table MTQ 33.3
Emphasis Given in High School Mathematics Classes to Various Instructional Objectives

	PERCENT OF CLASSES			
	NONE	MINIMAL EMPHASIS	MODERATE EMPHASIS	HEAVY EMPHASIS
Learning mathematics vocabulary	0 (0.1)	15 (1.4)	56 (1.5)	29 (1.5)
Learning mathematical procedures and/or algorithms	0 (0.1)	6 (1.0)	39 (1.8)	55 (1.8)
Learning to perform computations with speed and accuracy	3 (0.6)	26 (1.2)	49 (1.6)	21 (1.3)
Understanding mathematical ideas	0 ---†	2 (0.6)	29 (1.7)	69 (1.7)
Learning how to do mathematics (e.g., consider how to approach a problem, explain and justify solutions, create and use mathematical models)	0 (0.0)	5 (0.9)	32 (1.7)	63 (1.6)
Learning about real-life applications of mathematics	1 (0.3)	19 (1.4)	48 (1.2)	32 (1.4)
Increasing students' interest in mathematics	1 (0.4)	20 (1.2)	52 (1.6)	26 (1.3)
Developing students' confidence that they can successfully pursue careers in mathematics	2 (0.4)	18 (1.2)	43 (1.4)	37 (1.5)
Learning test-taking skills/strategies	2 (0.6)	26 (1.4)	47 (1.7)	25 (1.3)

† No high school mathematics teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table MTQ 34.1
Elementary School Mathematics Classes in Which Teachers Report Using Various Activities in Their Classrooms

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL MATHEMATICS LESSONS
Explain mathematical ideas to the whole class	0 (0.2)	1 (0.4)	4 (0.8)	21 (1.9)	73 (2.0)
Engage the whole class in discussions	0 (0.2)	1 (0.3)	4 (0.8)	24 (1.4)	71 (1.5)
Have students work in small groups	0 (0.1)	1 (0.4)	10 (1.1)	37 (2.0)	51 (2.4)
Provide manipulatives for students to use in problem-solving/investigations	0 (0.1)	4 (0.6)	18 (1.3)	43 (2.0)	35 (2.0)
Use flipped instruction (have students watch lectures/demonstrations outside of class to prepare for in-class activities)	53 (2.2)	22 (1.5)	12 (1.1)	7 (1.0)	6 (1.2)
Have students read from a textbook or other material in class, either aloud or to themselves	30 (1.6)	24 (1.4)	18 (1.7)	16 (1.3)	12 (1.1)
Have students write their reflections (e.g., in their journals, on exit tickets) in class or for homework	14 (1.4)	20 (1.3)	25 (1.7)	28 (1.5)	13 (1.2)
Focus on literacy skills (e.g., informational reading or writing strategies)	11 (1.3)	21 (1.5)	27 (1.4)	25 (1.5)	16 (1.5)
Have students practice for standardized tests	19 (1.5)	27 (1.5)	28 (1.5)	18 (1.5)	8 (0.8)

Table MTQ 34.2
Middle School Mathematics Classes in Which Teachers Report Using Various Activities in Their Classrooms

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL MATHEMATICS LESSONS
Explain mathematical ideas to the whole class	0 ---†	1 (0.2)	5 (0.9)	36 (2.0)	59 (2.2)
Engage the whole class in discussions	0 (0.0)	1 (0.4)	8 (1.0)	36 (2.1)	54 (2.0)
Have students work in small groups	0 (0.0)	3 (0.7)	20 (2.2)	43 (2.3)	35 (2.1)
Provide manipulatives for students to use in problem-solving/investigations	3 (1.1)	20 (1.7)	48 (2.4)	24 (2.0)	6 (0.9)
Use flipped instruction (have students watch lectures/demonstrations outside of class to prepare for in-class activities)	46 (2.1)	30 (2.1)	14 (1.5)	8 (1.1)	2 (0.5)
Have students read from a textbook or other material in class, either aloud or to themselves	28 (2.2)	27 (2.0)	22 (2.1)	17 (2.2)	7 (1.2)
Have students write their reflections (e.g., in their journals, on exit tickets) in class or for homework	12 (1.3)	29 (2.0)	29 (1.8)	22 (1.6)	8 (1.1)
Focus on literacy skills (e.g., informational reading or writing strategies)	16 (1.5)	34 (2.0)	29 (1.9)	16 (1.4)	4 (0.7)
Have students practice for standardized tests	7 (1.0)	29 (2.2)	33 (2.0)	25 (2.0)	7 (1.0)

† No middle school mathematics teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table MTQ 34.3
High School Mathematics Classes in Which Teachers Report Using Various Activities in Their Classrooms

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL MATHEMATICS LESSONS
Explain mathematical ideas to the whole class	0 (0.1)	1 (0.3)	4 (0.7)	29 (1.6)	65 (1.7)
Engage the whole class in discussions	0 (0.2)	4 (0.7)	12 (1.0)	34 (1.6)	50 (1.7)
Have students work in small groups	1 (0.5)	6 (1.0)	23 (1.4)	41 (1.8)	30 (1.7)
Provide manipulatives for students to use in problem-solving/investigations	8 (0.9)	33 (1.5)	39 (1.7)	16 (1.2)	4 (0.8)
Use flipped instruction (have students watch lectures/demonstrations outside of class to prepare for in-class activities)	44 (1.7)	30 (1.5)	16 (1.3)	6 (0.8)	4 (1.1)
Have students read from a textbook or other material in class, either aloud or to themselves	34 (1.8)	30 (1.5)	20 (1.6)	10 (1.0)	6 (1.0)
Have students write their reflections (e.g., in their journals, on exit tickets) in class or for homework	27 (1.3)	29 (1.5)	25 (1.6)	14 (1.2)	5 (0.9)
Focus on literacy skills (e.g., informational reading or writing strategies)	26 (1.5)	33 (1.5)	24 (1.1)	13 (1.1)	4 (0.8)
Have students practice for standardized tests	14 (1.3)	25 (1.6)	32 (1.4)	21 (1.3)	8 (0.8)

Table MTQ 35.1
Elementary School Mathematics Classes in Which Teachers Report Students Engaging in Various Aspects of Mathematics Practices

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL MATHEMATICS LESSONS
Work on challenging problems that require thinking beyond just applying rules, algorithms, or procedures	1 (0.4)	4 (0.6)	21 (1.4)	50 (1.9)	25 (1.5)
Figure out what a challenging problem is asking (by talking with their classmates and/or using manipulatives, pictures, diagrams, tables, or equations)	1 (0.3)	3 (0.5)	18 (1.5)	46 (1.8)	32 (1.8)
Reflect on their solution strategies as they work through a mathematics problem and revise as needed	1 (0.4)	5 (0.8)	19 (1.8)	44 (1.8)	31 (2.1)
Continue working through a mathematics problem when they reach points of difficulty, challenge, or error	1 (0.4)	2 (0.4)	16 (1.4)	42 (2.0)	39 (2.2)
Determine whether their answer makes sense (e.g., the answer has reasonable magnitude or sign, uses appropriate units, fits the context of the problem)	1 (0.4)	2 (0.5)	13 (1.3)	39 (1.8)	46 (2.0)
Represent aspects of a problem using mathematical symbols, pictures, diagrams, tables, or objects in order to solve it	0 (0.2)	1 (0.3)	10 (1.0)	39 (1.7)	49 (1.8)
Provide mathematical reasoning to explain, justify, or prove their thinking	1 (0.3)	2 (0.5)	12 (1.2)	41 (1.8)	44 (1.8)
Compare and contrast different solution strategies for a mathematics problem in terms of their strengths and limitations (e.g., their efficiency, generalizability, interpretability by others)	4 (0.7)	9 (0.9)	27 (1.5)	40 (1.6)	21 (1.6)
Analyze the mathematical reasoning of others (e.g., decide if their reasoning makes sense, identify correct ideas or flaws in their thinking)	3 (0.5)	7 (0.8)	25 (1.5)	42 (1.8)	23 (1.7)
Pose questions to clarify, challenge, or improve the mathematical reasoning of others	3 (0.6)	8 (1.0)	20 (1.7)	39 (1.6)	29 (1.9)
Identify relevant information and relationships that could be used to solve a mathematics problem (e.g., quantities and relationships needed to develop an equation that illustrates a situation or determines an outcome)	3 (0.6)	5 (0.7)	20 (1.7)	42 (1.6)	30 (1.5)

Develop a mathematical model (meaning, a representation of relevant information and relationships such as an equation, tape diagram, algorithm, or function) to solve a mathematics problem	3 (0.5)	5 (0.9)	17 (1.5)	39 (1.9)	36 (1.7)
Determine what tools (e.g., pencil and paper, manipulatives, ruler, protractor, calculator, spreadsheet) are appropriate for solving a mathematics problem	2 (0.5)	7 (1.0)	19 (1.6)	38 (1.8)	34 (1.6)
Determine what units are appropriate for expressing numerical answers, data, and/or measurements	3 (0.5)	6 (0.9)	19 (1.6)	39 (1.7)	33 (1.9)
Discuss how certain terms or phrases may have specific meanings in mathematics that are different from their meaning in everyday language	3 (0.6)	10 (1.1)	26 (1.4)	40 (2.0)	22 (1.5)
Identify patterns or characteristics of numbers, diagrams, or graphs that may be helpful in solving a mathematics problem	1 (0.4)	3 (0.6)	18 (1.4)	45 (1.9)	33 (1.9)
Work on generating a rule or formula (e.g., based on multiple problems, patterns, or repeated calculations)	6 (0.8)	9 (1.0)	27 (1.7)	38 (1.8)	20 (1.3)

Table MTQ 35.2
Middle School Mathematics Classes in Which Teachers Report Students Engaging in Various Aspects of Mathematics Practices

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL MATHEMATICS LESSONS
Work on challenging problems that require thinking beyond just applying rules, algorithms, or procedures	0 (0.1)	1 (0.4)	23 (2.0)	53 (2.2)	22 (1.7)
Figure out what a challenging problem is asking (by talking with their classmates and/or using manipulatives, pictures, diagrams, tables, or equations)	0 (0.2)	4 (0.8)	23 (1.8)	51 (2.3)	22 (1.5)
Reflect on their solution strategies as they work through a mathematics problem and revise as needed	0 (0.1)	6 (1.0)	29 (1.8)	43 (2.0)	22 (1.6)
Continue working through a mathematics problem when they reach points of difficulty, challenge, or error	0 (0.1)	3 (0.5)	16 (1.8)	49 (1.9)	32 (1.9)
Determine whether their answer makes sense (e.g., the answer has reasonable magnitude or sign, uses appropriate units, fits the context of the problem)	0 (0.1)	2 (0.8)	13 (1.7)	41 (2.0)	44 (2.0)
Represent aspects of a problem using mathematical symbols, pictures, diagrams, tables, or objects in order to solve it	0 (0.1)	3 (0.9)	21 (2.0)	42 (2.2)	33 (1.9)
Provide mathematical reasoning to explain, justify, or prove their thinking	0 (0.0)	2 (0.8)	15 (1.7)	44 (2.3)	39 (2.3)
Compare and contrast different solution strategies for a mathematics problem in terms of their strengths and limitations (e.g., their efficiency, generalizability, interpretability by others)	1 (0.3)	8 (0.9)	35 (2.1)	40 (1.9)	15 (1.4)
Analyze the mathematical reasoning of others (e.g., decide if their reasoning makes sense, identify correct ideas or flaws in their thinking)	1 (0.2)	9 (1.0)	30 (2.3)	40 (2.2)	21 (1.8)
Pose questions to clarify, challenge, or improve the mathematical reasoning of others	1 (0.3)	9 (1.1)	22 (1.8)	39 (2.3)	30 (2.0)
Identify relevant information and relationships that could be used to solve a mathematics problem (e.g., quantities and relationships needed to develop an equation that illustrates a situation or determines an outcome)	0 (0.0)	2 (0.4)	20 (2.0)	46 (2.3)	32 (2.0)

Develop a mathematical model (meaning, a representation of relevant information and relationships such as an equation, tape diagram, algorithm, or function) to solve a mathematics problem	0 (0.0)	5 (0.9)	25 (2.1)	44 (2.1)	26 (1.7)
Determine what tools (e.g., pencil and paper, manipulatives, ruler, protractor, calculator, spreadsheet) are appropriate for solving a mathematics problem	1 (0.3)	13 (1.6)	23 (1.7)	36 (2.0)	26 (1.7)
Determine what units are appropriate for expressing numerical answers, data, and/or measurements	0 (0.1)	4 (0.7)	22 (1.4)	45 (2.0)	29 (1.9)
Discuss how certain terms or phrases may have specific meanings in mathematics that are different from their meaning in everyday language	0 (0.2)	5 (0.8)	29 (2.0)	42 (1.8)	24 (1.6)
Identify patterns or characteristics of numbers, diagrams, or graphs that may be helpful in solving a mathematics problem	0 (0.1)	1 (0.4)	22 (1.8)	46 (2.0)	31 (1.9)
Work on generating a rule or formula (e.g., based on multiple problems, patterns, or repeated calculations)	0 (0.1)	5 (0.8)	25 (1.8)	47 (2.0)	22 (1.9)

Table MTQ 35.3
High School Mathematics Classes in Which Teachers Report Students Engaging in Various Aspects of Mathematics Practices

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL MATHEMATICS LESSONS
Work on challenging problems that require thinking beyond just applying rules, algorithms, or procedures	0 (0.2)	5 (0.7)	23 (1.3)	48 (1.4)	24 (1.7)
Figure out what a challenging problem is asking (by talking with their classmates and/or using manipulatives, pictures, diagrams, tables, or equations)	1 (0.3)	8 (1.0)	28 (1.6)	42 (1.8)	21 (1.6)
Reflect on their solution strategies as they work through a mathematics problem and revise as needed	2 (0.4)	8 (0.9)	30 (1.5)	42 (1.8)	20 (1.2)
Continue working through a mathematics problem when they reach points of difficulty, challenge, or error	0 (0.2)	4 (0.7)	16 (1.1)	47 (1.7)	32 (1.8)
Determine whether their answer makes sense (e.g., the answer has reasonable magnitude or sign, uses appropriate units, fits the context of the problem)	0 (0.2)	2 (0.4)	13 (1.1)	45 (1.3)	39 (1.3)
Represent aspects of a problem using mathematical symbols, pictures, diagrams, tables, or objects in order to solve it	1 (0.3)	4 (0.7)	20 (1.4)	43 (1.8)	33 (1.6)
Provide mathematical reasoning to explain, justify, or prove their thinking	0 (0.2)	4 (0.7)	19 (1.2)	40 (1.5)	36 (1.6)
Compare and contrast different solution strategies for a mathematics problem in terms of their strengths and limitations (e.g., their efficiency, generalizability, interpretability by others)	2 (0.5)	11 (0.9)	33 (1.7)	39 (1.7)	15 (1.2)
Analyze the mathematical reasoning of others (e.g., decide if their reasoning makes sense, identify correct ideas or flaws in their thinking)	3 (0.5)	11 (0.9)	34 (1.5)	38 (1.4)	15 (1.1)
Pose questions to clarify, challenge, or improve the mathematical reasoning of others	4 (0.7)	9 (0.9)	24 (1.5)	36 (1.4)	27 (1.3)
Identify relevant information and relationships that could be used to solve a mathematics problem (e.g., quantities and relationships needed to develop an equation that illustrates a situation or determines an outcome)	0 (0.2)	4 (0.7)	22 (1.6)	42 (1.7)	31 (1.7)

Develop a mathematical model (meaning, a representation of relevant information and relationships such as an equation, tape diagram, algorithm, or function) to solve a mathematics problem	1 (0.4)	8 (0.9)	27 (1.9)	41 (1.6)	23 (1.5)
Determine what tools (e.g., pencil and paper, manipulatives, ruler, protractor, calculator, spreadsheet) are appropriate for solving a mathematics problem	4 (0.5)	12 (1.3)	25 (1.5)	33 (1.6)	26 (1.5)
Determine what units are appropriate for expressing numerical answers, data, and/or measurements	1 (0.3)	8 (1.2)	24 (1.2)	41 (1.4)	26 (1.3)
Discuss how certain terms or phrases may have specific meanings in mathematics that are different from their meaning in everyday language	1 (0.4)	8 (1.0)	29 (1.7)	40 (1.6)	22 (1.3)
Identify patterns or characteristics of numbers, diagrams, or graphs that may be helpful in solving a mathematics problem	1 (0.4)	4 (1.0)	20 (1.2)	47 (1.7)	27 (1.5)
Work on generating a rule or formula (e.g., based on multiple problems, patterns, or repeated calculations)	1 (0.4)	8 (0.9)	30 (1.4)	40 (1.6)	20 (1.4)

Table MTQ 36
Mathematics Classes in Which Teachers Report Incorporating Coding Into Mathematics Instruction, by Grade Range

	PERCENT OF CLASSES		
	ELEMENTARY	MIDDLE	HIGH
Never	74 (2.0)	86 (2.1)	89 (1.0)
Rarely (e.g., A few times per year)	15 (1.7)	11 (1.6)	9 (0.9)
Sometimes (e.g., Once or twice a month)	7 (1.1)	3 (1.3)	2 (0.4)
Often (e.g., Once or twice a week)	3 (0.8)	0 (0.3)	1 (0.2)
All or almost all mathematics lessons	0 (0.3)	0 (0.1)	0 (0.1)

Table MTQ 37
Amount of Homework Assigned in Mathematics Classes Per Week, by Grade Range

	PERCENT OF CLASSES		
	ELEMENTARY	MIDDLE	HIGH
None	9 (1.5)	5 (1.5)	4 (0.7)
1–15 minutes per week	17 (1.7)	7 (1.3)	4 (0.7)
16–30 minutes per week	25 (1.9)	16 (2.1)	12 (1.6)
31–60 minutes per week	31 (2.3)	34 (2.4)	29 (1.7)
61–90 minutes per week	11 (1.5)	21 (2.2)	26 (1.6)
91–120 minutes per week	6 (1.0)	13 (2.0)	14 (1.3)
More than 2 hours per week	1 (0.4)	4 (1.3)	12 (1.5)

Table MTQ 38
Frequency of Required External Mathematics Testing in Mathematics Classes, by Grade Range

	PERCENT OF CLASSES		
	ELEMENTARY	MIDDLE	HIGH
Never	9 (1.3)	1 (0.4)	20 (1.6)
Once a year	9 (1.3)	12 (2.1)	25 (1.9)
Twice a year	9 (1.4)	11 (1.6)	22 (1.8)
Three or four times a year	48 (2.8)	43 (2.7)	24 (1.7)
Five or more times a year	25 (2.2)	33 (2.7)	10 (1.3)

Table MTQ 39
Availability of Projection Devices in Mathematics Classrooms, by Grade Range

	PERCENT OF CLASSES		
	ELEMENTARY	MIDDLE	HIGH
Always available in your classroom	96 (0.8)	96 (1.0)	94 (1.0)
Available upon request	2 (0.5)	3 (0.9)	5 (1.0)
Not available	2 (0.7)	1 (0.4)	1 (0.4)

Table MTQ 40.1
Adequacy of Classroom Resources for Mathematics Instruction in Elementary Schools

	PERCENT OF CLASSES				
	NOT ADEQUATE 1	2	SOMEWHAT ADEQUATE 3	4	ADEQUATE 5
Instructional technology (e.g., calculators, computers, probes/sensors)	7 (1.2)	5 (1.0)	21 (1.8)	15 (1.5)	52 (2.2)
Measurement tools (e.g., protractors, rulers)	3 (0.7)	3 (0.7)	15 (1.4)	16 (1.7)	63 (2.3)
Manipulatives (e.g., pattern blocks, algebra tiles)	1 (0.5)	3 (0.6)	9 (1.5)	19 (1.9)	68 (2.2)
Consumable supplies (e.g., graphing paper, batteries)	6 (1.1)	8 (1.3)	21 (2.1)	19 (1.8)	45 (2.7)

Table MTQ 40.2
Adequacy of Classroom Resources for Mathematics Instruction in Middle Schools

	PERCENT OF CLASSES				
	NOT ADEQUATE 1	2	SOMEWHAT ADEQUATE 3	4	ADEQUATE 5
Instructional technology (e.g., calculators, computers, probes/sensors)	3 (1.0)	3 (1.5)	14 (1.7)	15 (1.7)	65 (2.7)
Measurement tools (e.g., protractors, rulers)	2 (0.6)	3 (1.4)	13 (1.8)	17 (1.8)	65 (2.7)
Manipulatives (e.g., pattern blocks, algebra tiles)	8 (2.3)	6 (1.2)	23 (2.4)	21 (2.2)	42 (2.8)
Consumable supplies (e.g., graphing paper, batteries)	3 (0.7)	3 (0.8)	19 (2.1)	23 (2.3)	52 (2.7)

Table MTQ 40.3
Adequacy of Classroom Resources for Mathematics Instruction in High Schools

	PERCENT OF CLASSES				
	NOT ADEQUATE 1	2	SOMEWHAT ADEQUATE 3	4	ADEQUATE 5
Instructional technology (e.g., calculators, computers, probes/sensors)	1 (0.4)	2 (0.6)	11 (1.4)	16 (1.9)	69 (2.1)
Measurement tools (e.g., protractors, rulers)	3 (0.6)	4 (0.7)	14 (1.4)	16 (1.4)	64 (1.8)
Manipulatives (e.g., pattern blocks, algebra tiles)	14 (1.3)	14 (1.7)	21 (1.5)	15 (1.6)	35 (2.2)
Consumable supplies (e.g., graphing paper, batteries)	4 (0.7)	5 (1.0)	14 (1.2)	22 (1.7)	55 (1.7)

Table MTQ 41.1
Frequency of Use of Various Instructional Resources in Elementary School Mathematics Classes

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL MATHEMATICS LESSONS
Commercially published textbooks (printed or electronic), including the supplementary materials (e.g., worksheets) that accompany the textbooks	9 (1.1)	6 (1.0)	9 (1.1)	21 (1.5)	55 (2.2)
State county/district/diocese-developed units or lessons	23 (1.5)	17 (1.1)	20 (1.7)	19 (1.6)	22 (1.6)
Online units or courses that students work through at their own pace (e.g., i-Ready, Edgenuity)	38 (1.9)	12 (1.2)	13 (1.4)	23 (1.6)	13 (1.4)
Lessons or resources from websites that have a subscription fee or per lesson cost (e.g., BrainPOP, Discovery Ed, Teachers Pay Teachers)	9 (1.1)	12 (1.4)	26 (1.6)	42 (2.0)	12 (1.2)
Lessons or resources from websites that are free (e.g., Khan Academy, Illustrative Math)	18 (1.4)	17 (1.4)	28 (1.6)	25 (1.4)	12 (1.6)
Units or lessons you created (either by yourself or with others)	11 (1.2)	16 (1.5)	30 (1.9)	27 (1.7)	17 (1.5)
Units or lessons you collected from any other source (e.g., conferences, journals, colleagues, university or museum partners)	18 (1.4)	24 (1.5)	28 (1.8)	23 (1.6)	8 (1.0)

Table MTQ 41.2
Frequency of Use of Various Instructional Resources in Middle School Mathematics Classes

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL MATHEMATICS LESSONS
Commercially published textbooks (printed or electronic), including the supplementary materials (e.g., worksheets) that accompany the textbooks	13 (1.6)	9 (1.2)	13 (1.3)	27 (2.4)	38 (2.4)
State county/district/diocese-developed units or lessons	29 (2.2)	24 (2.3)	22 (1.8)	13 (1.2)	12 (1.4)
Online units or courses that students work through at their own pace (e.g., i-Ready, Edgenuity)	39 (2.2)	18 (1.6)	19 (1.9)	19 (1.6)	5 (1.1)
Lessons or resources from websites that have a subscription fee or per lesson cost (e.g., BrainPOP, Discovery Ed, Teachers Pay Teachers)	18 (1.7)	17 (1.7)	31 (2.1)	28 (2.2)	6 (1.1)
Lessons or resources from websites that are free (e.g., Khan Academy, Illustrative Math)	7 (1.3)	17 (1.7)	37 (2.0)	30 (2.3)	8 (1.1)
Units or lessons you created (either by yourself or with others)	4 (0.6)	9 (1.5)	22 (1.8)	37 (2.2)	28 (1.8)
Units or lessons you collected from any other source (e.g., conferences, journals, colleagues, university or museum partners)	12 (1.6)	26 (1.7)	32 (2.0)	24 (1.8)	7 (0.9)

Table MTQ 41.3
Frequency of Use of Various Instructional Resources in High School Mathematics Classes

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL MATHEMATICS LESSONS
Commercially published textbooks (printed or electronic), including the supplementary materials (e.g., worksheets) that accompany the textbooks	13 (1.4)	13 (1.0)	13 (1.0)	26 (1.2)	35 (1.7)
State county/district/diocese-developed units or lessons	39 (1.8)	22 (1.4)	17 (1.1)	12 (1.0)	11 (1.1)
Online units or courses that students work through at their own pace (e.g., i-Ready, Edgenuity)	59 (1.8)	18 (1.2)	12 (1.3)	8 (0.9)	4 (0.7)
Lessons or resources from websites that have a subscription fee or per lesson cost (e.g., BrainPOP, Discovery Ed, Teachers Pay Teachers)	42 (1.4)	20 (1.4)	19 (1.1)	14 (0.8)	5 (0.8)
Lessons or resources from websites that are free (e.g., Khan Academy, Illustrative Math)	16 (1.0)	25 (1.3)	33 (1.4)	19 (1.3)	7 (0.7)
Units or lessons you created (either by yourself or with others)	3 (0.6)	5 (0.8)	14 (1.1)	31 (1.4)	47 (1.7)
Units or lessons you collected from any other source (e.g., conferences, journals, colleagues, university or museum partners)	13 (1.2)	21 (1.4)	31 (1.5)	25 (1.5)	10 (0.9)

Table MTQ 42
Mathematics Classes for Which the District/Diocese Designates Instructional Materials to Be Used

	PERCENT OF CLASSES
Elementary	91 (1.3)
Middle	80 (2.1)
High	66 (1.7)

Table MTQ 43
Mathematics Classes for Which Various Types of Instructional Materials Are Designated, by Grade Range

	PERCENT OF CLASSES		
	ELEMENTARY	MIDDLE	HIGH
Commercially published textbooks (printed or electronic), including the supplementary materials (e.g., worksheets) that accompany the textbooks	81 (1.9)	70 (2.6)	60 (1.8)
State county/district/diocese-developed instructional materials	40 (2.1)	29 (2.0)	21 (1.4)
Online units or courses that students work through at their own pace (e.g., i-Ready, Edgenuity)	30 (1.7)	27 (2.5)	8 (1.2)
Lessons or resources from websites that have a subscription fee or per lesson cost (e.g., BrainPOP, Discovery Ed, Teachers Pay Teachers)	28 (1.8)	18 (1.6)	10 (1.0)
Lessons or resources from websites that are free (e.g., Khan Academy, Illustrative Math)	25 (1.7)	24 (2.1)	16 (1.2)

There is no table for MTQ 44.

Table MTQ 45a
Copyright Year of Instructional Materials Used in Mathematics Classes, by Grade Range

	PERCENT OF CLASSES†		
	ELEMENTARY	MIDDLE	HIGH
2018	1 (0.5)	1 (0.3)	1 (0.4)
2017	3 (1.0)	6 (1.4)	4 (1.0)
2016	6 (1.4)	7 (2.2)	6 (0.8)
2015	20 (2.5)	14 (1.8)	9 (1.2)
2014	19 (2.2)	17 (2.2)	12 (1.8)
2013	7 (1.5)	19 (2.2)	9 (1.3)
2012 or earlier	45 (2.9)	36 (3.2)	60 (2.2)

† Includes only mathematics classes for which teachers indicated in Q41 that they use one or multiple commercially published textbooks.

Table MTQ 45b.1
Publishers of Textbooks Used in Elementary School Mathematics Classes

	PERCENT OF CLASSES†
Houghton Mifflin Harcourt	39 (3.2)
Pearson	21 (3.1)
McGraw-Hill Education	19 (2.6)
Great Minds	10 (1.9)
Wiley	3 (0.9)
Curriculum Associates	2 (0.7)
Origo Education	2 (1.0)
Marshall Cavendish Education	1 (0.6)
Sharon Wells Mathematics	1 (0.1)
The Math Learning Center	1 (0.4)
Abeka	0 (0.1)
Alpha Omega Publications	0 (0.0)
BJU Press	0 (0.2)
Carson-Dellosa	0 (0.1)
CPM Educational Program	0 (0.1)
Developing Mathematical Thinking Institute	0 (0.0)
Elmwood Education	0 (0.1)
Georgia Department of Education	0 (0.2)
Heinemann	0 (0.2)
Mentoring Minds	0 (0.3)
Minneapolis Public Schools	0 (0.1)
Odysseyware	0 (0.0)
Pensacola Christian College	0 (0.0)
Sadlier	0 (0.2)
Teaching Strategies	0 (0.2)
Usbourne	0 (0.1)
Zearn	0 (0.2)

† Includes only elementary mathematics classes for which teachers indicated in Q41 that they use one or multiple commercially published textbooks.

Table MTQ 45b.2
Publishers of Textbooks Used in Middle School Mathematics Classes

	PERCENT OF CLASSES†
Houghton Mifflin Harcourt	37 (3.1)
McGraw-Hill Education	26 (2.8)
Pearson	17 (2.5)
Great Minds	6 (1.7)
Carnegie Learning	3 (1.0)
CPM Educational Program	3 (1.4)
Curriculum Associates	2 (0.5)
Larson Texts	2 (0.8)
Sadlier	2 (0.7)
AgileMind	1 (0.6)
Marshall Cavendish Education	1 (0.3)
The College Board	1 (0.6)
BJU Press	0 (0.2)
Discovery Education	0 (0.1)
Illustrative Mathematics	0 (0.1)
Mathematics Vision Project	0 (0.1)
Mentoring Minds	0 (0.2)
SMc Curriculum	0 (0.3)
Stenhouse Publishers	0 (0.1)
University of Utah	0 (0.2)
Voyager Sopris Learning	0 (0.1)
Wiley	0 (0.3)

† Includes only middle school mathematics classes for which teachers indicated in Q41 that they use one or multiple commercially published textbooks.

Table MTQ 45b.3
Publishers of Textbooks Used in High School Mathematics Classes

	PERCENT OF CLASSES†
Pearson	27 (2.2)
Houghton Mifflin Harcourt	26 (1.9)
McGraw-Hill Education	19 (1.9)
Cengage	9 (1.1)
CPM Educational Program	3 (0.9)
Larson Texts	2 (0.5)
Macmillan	2 (0.4)
Birkh	1 (0.6)
Carnegie Learning	1 (0.4)
eMATHinstruction	1 (0.6)
Great Minds	1 (0.6)
Haese Mathematics	1 (0.2)
Key Curriculum Press	1 (0.4)
Oxford University Press	1 (0.3)
The College Board	1 (0.4)
Wiley	1 (0.3)
Academic Internet Publishers	0 (0.0)
Accelerated Christian Education	0 (0.2)
Algebra Nation	0 (0.1)
AQR Press	0 (0.1)
Barron's Educational Series	0 (0.3)
BJU Press	0 (0.2)
Cambridge	0 (0.2)
Continental Press	0 (0.1)
Cosenza & Associates	0 (0.0)
Council for Economic Education	0 (0.0)
Education Time Courseware, Inc.	0 (0.1)
Hilliard City Schools	0 (0.1)
Kaplan	0 (0.1)
Kendall Hunt	0 (0.3)
Lampo Group	0 (0.2)
Mike Patterson	0 (0.1)
Olympus Publishing	0 (0.1)
Perfection Learning	0 (0.1)
Perfection Learning Corp	0 (0.1)
Polka Dot Publishing	0 (0.1)
Ramsey Education	0 (0.3)
Ramsey Press	0 (0.0)
ResponsiveEd	0 (0.0)
Southern Regional Education Board	0 (0.0)
Springer International Publishing	0 (0.0)
The Dana Center	0 (0.1)

The Princeton Review	0 (0.1)
University of Washington	0 (0.0)
Voyager Sopris Learning	0 (0.1)
Whole Spirit Press	0 (0.1)
Wieser Educational	0 (0.1)
William S. Hart Union High School District	0 (0.2)
XYZ Textbooks	0 (0.0)

† Includes only high school mathematics classes for which teachers indicated in Q41 that they use one or multiple commercially published textbooks.

Table MTQ 46.1
Elementary School Mathematics Classes in Which Teachers Report the Effect Various Factors Have on Mathematics Instruction

	PERCENT OF CLASSES					
	INHIBITS EFFECTIVE INSTRUCTION 1	2	NEUTRAL OR MIXED 3	4	PROMOTES EFFECTIVE INSTRUCTION 5	N/A
Current state standards	2 (0.6)	2 (0.6)	17 (1.7)	23 (1.5)	55 (2.1)	2 (0.5)
District/Diocese and/or school pacing guides	5 (0.9)	8 (1.3)	20 (1.9)	24 (2.1)	39 (2.0)	4 (0.8)
State district/diocese testing/accountability policies†	9 (1.3)	11 (1.6)	33 (2.6)	20 (1.8)	22 (1.6)	4 (1.0)
Textbook selection policies	7 (1.2)	10 (1.5)	35 (2.3)	18 (1.7)	20 (1.5)	10 (1.5)
Teacher evaluation policies	4 (0.9)	7 (1.2)	38 (2.2)	21 (1.6)	26 (2.0)	5 (1.0)
Students' prior knowledge and skills	5 (1.2)	9 (1.5)	15 (1.7)	20 (1.8)	50 (2.1)	1 (0.3)
Students' motivation, interest, and effort in mathematics	5 (1.1)	8 (1.3)	15 (1.8)	23 (2.1)	47 (2.2)	0 (0.2)
Parent/guardian expectations and involvement	11 (1.8)	12 (1.5)	23 (1.8)	25 (2.2)	27 (2.2)	2 (0.7)
Principal support	2 (0.7)	3 (0.9)	17 (1.6)	23 (2.1)	54 (2.6)	1 (0.4)
Amount of time for you to plan, individually and with colleagues	5 (1.0)	8 (1.4)	16 (1.6)	21 (1.9)	49 (2.6)	1 (0.3)
Amount of time available for your professional development	6 (1.0)	10 (1.2)	25 (2.0)	22 (2.0)	36 (2.1)	2 (0.5)
Amount of instructional time devoted to mathematics	2 (0.6)	3 (0.7)	12 (1.5)	23 (2.5)	60 (2.4)	1 (0.5)

† This item was presented only to public and Catholic schools.

Table MTQ 46.2
Middle School Mathematics Classes in Which Teachers Report the Effect Various Factors Have on Mathematics Instruction

	PERCENT OF CLASSES					
	INHIBITS EFFECTIVE INSTRUCTION 1	2	NEUTRAL OR MIXED 3	4	PROMOTES EFFECTIVE INSTRUCTION 5	N/A
Current state standards	2 (0.6)	4 (0.8)	24 (2.8)	25 (2.0)	44 (2.9)	1 (0.4)
District/Diocese and/or school pacing guides	4 (1.2)	5 (0.9)	27 (2.4)	27 (2.2)	26 (2.5)	11 (1.8)
State district/diocese testing/accountability policies†	11 (2.1)	13 (1.8)	34 (2.9)	20 (2.3)	18 (2.4)	4 (1)
Textbook selection policies	9 (1.8)	11 (1.8)	38 (2.8)	15 (2.1)	14 (1.7)	13 (2.3)
Teacher evaluation policies	4 (0.8)	8 (1.3)	40 (2.6)	20 (2.0)	21 (2.3)	7 (1.7)
Students' prior knowledge and skills	13 (2.0)	14 (1.7)	15 (1.6)	25 (2.2)	33 (2.3)	2 (1.4)
Students' motivation, interest, and effort in mathematics	12 (2.1)	15 (1.6)	16 (1.8)	22 (2.2)	32 (2.3)	2 (1.5)
Parent/guardian expectations and involvement	10 (1.8)	16 (1.7)	26 (1.9)	23 (2.2)	21 (2)	4 (1.6)
Principal support	0 (0.2)	4 (1.4)	20 (1.8)	26 (2.4)	46 (2.5)	3 (0.8)
Amount of time for you to plan, individually and with colleagues	4 (1.2)	7 (1.6)	15 (2)	25 (2.5)	45 (2.6)	3 (0.9)
Amount of time available for your professional development	4 (1.5)	10 (1.4)	31 (2.8)	26 (2.3)	27 (2.8)	2 (0.8)

† This item was presented only to public and Catholic schools.

Table MTQ 46.3
High School Mathematics Classes in Which Teachers Report the Effect Various Factors Have on Mathematics Instruction

	PERCENT OF CLASSES					
	INHIBITS EFFECTIVE INSTRUCTION 1	2	NEUTRAL OR MIXED 3	4	PROMOTES EFFECTIVE INSTRUCTION 5	N/A
Current state standards	3 (0.6)	4 (0.9)	29 (1.5)	28 (1.7)	30 (1.8)	6 (0.9)
District/Diocese and/or school pacing guides	3 (0.9)	5 (0.9)	26 (1.7)	24 (2.0)	26 (1.9)	16 (1.4)
State district/diocese testing/accountability policies†	7 (0.9)	13 (1.7)	34 (2.1)	17 (1.4)	17 (1.6)	11 (1.2)
Textbook selection policies	7 (1.1)	6 (0.9)	35 (2.0)	20 (1.6)	16 (1.6)	16 (1.5)
Teacher evaluation policies	5 (0.9)	7 (0.7)	38 (2.2)	24 (1.6)	20 (1.7)	7 (1.0)
College entrance requirements	1 (0.5)	3 (0.5)	31 (2.2)	27 (1.9)	27 (1.9)	10 (1.3)
Students' prior knowledge and skills	10 (1.4)	17 (1.5)	16 (1.4)	24 (1.8)	32 (1.9)	0 (0.1)
Students' motivation, interest, and effort in mathematics	12 (1.2)	17 (1.5)	18 (1.6)	22 (1.5)	30 (1.5)	0 (0.2)
Parent/guardian expectations and involvement	9 (1.2)	14 (1.4)	35 (1.9)	21 (1.6)	18 (1.5)	3 (0.5)
Principal support	1 (0.4)	5 (0.8)	22 (2.0)	26 (1.7)	42 (2.0)	3 (0.6)
Amount of time for you to plan, individually and with colleagues	6 (1.0)	7 (1.0)	18 (1.4)	25 (1.9)	43 (1.8)	2 (0.4)
Amount of time available for your professional development	5 (1.0)	11 (1.4)	29 (1.8)	27 (1.7)	26 (1.8)	3 (0.7)

† This item was presented only to public and Catholic schools.

Table MTQ 47
Focus of the Most Recently Completed Mathematics Unit, by Grade Range

	PERCENT OF CLASSES		
	ELEMENTARY	MIDDLE	HIGH
Number and Operations	59 (2.0)	21 (2.0)	2 (0.4)
Measurement and Data Representation	24 (1.8)	5 (0.9)	1 (0.3)
Algebra	3 (0.6)	40 (2.1)	48 (1.3)
Geometry	14 (1.3)	21 (1.8)	22 (1.3)
Probability	0 (0.2)	5 (1.1)	2 (0.4)
Statistics	0 (0.0)	7 (1.2)	5 (0.7)
Trigonometry	0 ---†	0 (0.2)	11 (0.9)
Calculus	0 ---†	0 ---†	8 (0.7)

† No mathematics teachers at this grade range in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table MTQ 48
Most Recent Mathematics Unit Based Primarily on Any Commercially Published Textbook or State/County/District-Developed Materials

	PERCENT OF CLASSES†
Elementary	81 (1.5)
Middle	70 (2.3)
High	73 (1.8)

† Includes only mathematics classes for which teachers indicated in Q41 that they use commercially published textbooks or state/county/district/diocese-developed units or lessons more than once a month.

Table MTQ 49.1
Ways Instructional Materials Were Used in the Most Recently Completed Unit in Elementary School Mathematics Classes

	PERCENT OF CLASSES†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
I used these materials to guide the structure and content emphasis of the unit.	0 (0.2)	1 (0.4)	11 (1.5)	29 (2.5)	59 (2.7)
I picked what is important from these materials and skipped the rest.	17 (1.4)	14 (1.6)	20 (1.9)	27 (2.1)	22 (1.7)
I incorporated activities (e.g., problems, investigations, readings) from other sources to supplement what these materials were lacking.	5 (0.9)	6 (1.0)	20 (1.4)	35 (2.2)	33 (2.2)
I modified activities from these materials.	4 (0.8)	8 (1.1)	27 (2.0)	36 (1.7)	25 (1.9)

† Includes only elementary mathematics classes for which teachers responded yes in Q48.

Table MTQ 49.2
Ways Instructional Materials Were Used in the Most Recently Completed Unit in Middle School Mathematics Classes

	PERCENT OF CLASSES†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
I used these materials to guide the structure and content emphasis of the unit.	0 (0.2)	1 (0.4)	16 (1.8)	33 (2.6)	50 (2.9)
I picked what is important from these materials and skipped the rest.	10 (1.6)	13 (1.7)	25 (2.8)	31 (2.8)	22 (2.1)
I incorporated activities (e.g., problems, investigations, readings) from other sources to supplement what these materials were lacking.	7 (1.7)	7 (1.7)	22 (2.3)	36 (2.5)	29 (2.4)
I modified activities from these materials.	3 (0.9)	6 (1.1)	29 (2.8)	39 (2.6)	23 (2.0)

† Includes only middle school mathematics classes for which teachers responded yes in Q48.

Table MTQ 49.3
Ways Instructional Materials Were Used in the Most Recently Completed Unit in High School Mathematics Classes

	PERCENT OF CLASSES†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
I used these materials to guide the structure and content emphasis of the unit.	1 (0.2)	1 (0.3)	17 (1.5)	32 (2.1)	49 (2.4)
I picked what is important from these materials and skipped the rest.	12 (1.5)	14 (1.3)	23 (1.5)	30 (1.8)	22 (1.5)
I incorporated activities (e.g., problems, investigations, readings) from other sources to supplement what these materials were lacking.	6 (0.7)	9 (1.0)	21 (1.8)	33 (2.1)	32 (2.2)
I modified activities from these materials.	5 (0.8)	8 (0.9)	26 (2.1)	39 (2.0)	22 (1.4)

† Includes only high school mathematics classes for which teachers responded yes in Q48.

Table MTQ 50.1
Reasons Parts of the Instructional Materials Were Skipped in Elementary School Mathematics Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
The mathematical ideas addressed in the activities I skipped are not included in my pacing guide/standards.	35 (2.8)	33 (2.4)	32 (3.2)
I did not have the materials needed to implement the activities I skipped.	74 (2.3)	17 (1.9)	9 (1.5)
I did not have the knowledge needed to implement the activities I skipped.	91 (2.5)	6 (2.0)	3 (1.1)
The activities I skipped were too difficult for my students.	62 (2.8)	27 (2.2)	11 (1.6)
My students already knew the mathematical ideas or were able to learn them without the activities I skipped.	33 (2.9)	35 (2.9)	32 (2.8)
I have different activities for those mathematical ideas that work better than the ones I skipped.	20 (2.2)	33 (2.7)	47 (2.8)
I did not have enough instructional time for the activities I skipped.	39 (3.1)	40 (2.9)	21 (2.6)

† Includes only elementary school mathematics classes for which teachers responded yes in Q48 and indicated in Q49 that they “picked what was important from these materials and skipped the rest” to any extent.

Table MTQ 50.2
Reasons Parts of the Instructional Materials Were Skipped in Middle School Mathematics Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
The mathematical ideas addressed in the activities I skipped are not included in my pacing guide/standards.	28 (3.1)	34 (3.3)	38 (3.5)
I did not have the materials needed to implement the activities I skipped.	73 (3.0)	21 (2.7)	6 (1.3)
I did not have the knowledge needed to implement the activities I skipped.	89 (2.4)	10 (2.1)	2 (0.7)
The activities I skipped were too difficult for my students.	56 (3.6)	33 (3.2)	12 (2.0)
My students already knew the mathematical ideas or were able to learn them without the activities I skipped.	41 (3.5)	37 (3.7)	22 (3.1)
I have different activities for those mathematical ideas that work better than the ones I skipped.	20 (2.5)	37 (2.9)	44 (3.3)
I did not have enough instructional time for the activities I skipped.	29 (3.1)	40 (3.4)	31 (3.1)

† Includes only middle school mathematics classes for which teachers responded yes in Q48 and indicated in Q49 that they "picked what was important from these materials and skipped the rest" to any extent.

Table MTQ 50.3
Reasons Parts of the Instructional Materials Were Skipped in High School Mathematics Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
The mathematical ideas addressed in the activities I skipped are not included in my pacing guide/standards.	27 (2.1)	35 (2.8)	38 (2.6)
I did not have the materials needed to implement the activities I skipped.	76 (2.2)	19 (2.0)	5 (1.2)
I did not have the knowledge needed to implement the activities I skipped.	91 (1.6)	8 (1.5)	1 (0.5)
The activities I skipped were too difficult for my students.	45 (2.5)	39 (2.7)	17 (2.1)
My students already knew the mathematical ideas or were able to learn them without the activities I skipped.	46 (2.5)	35 (2.6)	18 (1.6)
I have different activities for those mathematical ideas that work better than the ones I skipped.	26 (2.2)	37 (2.7)	37 (2.3)
I did not have enough instructional time for the activities I skipped.	31 (2.4)	34 (2.6)	36 (2.6)

† Includes only high school mathematics classes for which responded yes in Q48 and indicated in Q49 that they "picked what was important from these materials and skipped the rest" to any extent.

Table MTQ 51.1
Reasons Why the Instructional Materials Were Supplemented in Elementary School Mathematics Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
My pacing guide indicated that I should use supplemental activities.	55 (3.0)	30 (2.8)	15 (2.4)
Supplemental activities were needed to prepare students for standardized tests.	40 (2.9)	36 (2.7)	25 (2.3)
Supplemental activities were needed to provide students with additional practice.	5 (1.0)	32 (2.2)	63 (2.3)
Supplemental activities were needed so students at different levels of achievement could increase their understanding of the ideas targeted in each activity.	6 (1.3)	24 (2.7)	69 (2.5)
I had additional activities that I liked.	20 (2.0)	40 (2.6)	41 (2.2)

† Includes only elementary school mathematics classes for which teachers responded yes in Q48 and indicated in Q49 that they "incorporated activities (e.g., problems, investigations, readings) from other sources to supplement what these materials were lacking" to any extent.

Table MTQ 51.2
Reasons Why the Instructional Materials Were Supplemented in Middle School Mathematics Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
My pacing guide indicated that I should use supplemental activities.	63 (3.7)	25 (3.0)	12 (2.3)
Supplemental activities were needed to prepare students for standardized tests.	28 (3.4)	43 (3.2)	28 (2.9)
Supplemental activities were needed to provide students with additional practice.	6 (1.3)	26 (3.0)	68 (3.1)
Supplemental activities were needed so students at different levels of achievement could increase their understanding of the ideas targeted in each activity.	3 (1.0)	32 (3.2)	65 (3.2)
I had additional activities that I liked.	15 (2.3)	35 (2.9)	50 (3.2)

† Includes only middle school mathematics classes for which teachers responded yes in Q48 and indicated in Q49 that they "incorporated activities (e.g., problems, investigations, readings) from other sources to supplement what these materials were lacking" to any extent.

Table MTQ 51.3
Reasons Why the Instructional Materials Were Supplemented in High School Mathematics Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
My pacing guide indicated that I should use supplemental activities.	59 (2.6)	31 (2.3)	10 (1.7)
Supplemental activities were needed to prepare students for standardized tests.	44 (2.6)	34 (2.7)	22 (2.0)
Supplemental activities were needed to provide students with additional practice.	9 (1.6)	31 (1.9)	60 (2.2)
Supplemental activities were needed so students at different levels of achievement could increase their understanding of the ideas targeted in each activity.	11 (1.9)	34 (2.1)	54 (2.3)
I had additional activities that I liked.	20 (1.9)	43 (2.2)	37 (2.2)

† Includes only high school mathematics classes for which teachers responded yes in Q48 and indicated in Q49 that they "incorporated activities (e.g., problems, investigations, readings) from other sources to supplement what these materials were lacking" to any extent.

Table MTQ 52.1
Reasons Why Instructional Materials Were Modified in Elementary School Mathematics Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
I did not have the necessary materials/supplies for the original activities.	73 (2.4)	18 (1.9)	9 (2.0)
The original activities were too difficult conceptually for my students.	50 (3.1)	34 (2.6)	16 (1.8)
The original activities were too easy conceptually for my students.	48 (3.2)	41 (2.9)	11 (1.6)
I did not have enough instructional time to implement the activities as designed.	48 (2.7)	34 (2.7)	19 (2.2)
The original activities were too structured for my students.	68 (2.4)	25 (2.3)	7 (1.3)
The original activities were not structured enough for my students.	69 (2.5)	25 (2.2)	6 (1.2)

† Includes only elementary school mathematics classes for which teachers responded yes in Q48 and indicated in Q49 that they "modified activities from these materials" to any extent.

Table MTQ 52.2
Reasons Why Instructional Materials Were Modified in Middle School Mathematics Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
I did not have the necessary materials/supplies for the original activities.	71 (3.0)	24 (2.8)	5 (1.4)
The original activities were too difficult conceptually for my students.	45 (3.2)	38 (3.0)	18 (2.4)
The original activities were too easy conceptually for my students.	56 (3.2)	35 (2.9)	9 (1.6)
I did not have enough instructional time to implement the activities as designed.	32 (2.7)	40 (2.8)	28 (3.2)
The original activities were too structured for my students.	65 (3.2)	29 (3.1)	6 (1.5)
The original activities were not structured enough for my students.	61 (3.1)	32 (3.4)	7 (1.4)

† Includes only middle school mathematics classes for which teachers responded yes in Q48 and indicated in Q49 that they "modified activities from these materials" to any extent.

Table MTQ 52.3
Reasons Why Instructional Materials Were Modified in High School Mathematics Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
I did not have the necessary materials/supplies for the original activities.	72 (2.0)	24 (2.0)	5 (1.0)
The original activities were too difficult conceptually for my students.	46 (2.8)	38 (2.5)	16 (2.0)
The original activities were too easy conceptually for my students.	62 (2.1)	31 (2.2)	7 (1.4)
I did not have enough instructional time to implement the activities as designed.	42 (2.6)	34 (2.3)	23 (1.8)
The original activities were too structured for my students.	69 (2.2)	27 (2.2)	5 (1.4)
The original activities were not structured enough for my students.	65 (2.0)	30 (2.1)	5 (1.0)

† Includes only high school mathematics classes for which responded yes in Q48 and indicated in Q49 that they "modified activities from these materials" to any extent.

Table MTQ 53.1
Elementary School Mathematics Classes Taught by Teachers Feeling Prepared for Each of a Number of Tasks in the Most Recent Unit

	PERCENT OF CLASSES			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
Anticipate difficulties that students will have with particular mathematical ideas and procedures in this unit	1 (0.3)	11 (1.2)	45 (1.7)	43 (1.7)
Find out what students thought or already knew about the key mathematical ideas	1 (0.4)	13 (1.5)	44 (2.1)	42 (2.1)
Implement the instructional materials (e.g., mathematics textbook) to be used during this unit	1 (0.3)	8 (1.1)	35 (1.6)	55 (1.8)
Monitor student understanding during this unit	1 (0.3)	4 (0.8)	35 (1.6)	60 (1.8)
Assess student understanding at the conclusion of this unit	0 (0.2)	4 (0.8)	31 (1.7)	64 (1.9)

Table MTQ 53.2
Middle School Mathematics Classes Taught by Teachers Feeling Prepared for Each of a Number of Tasks in the Most Recent Unit

	PERCENT OF CLASSES			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
Anticipate difficulties that students will have with particular mathematical ideas and procedures in this unit	1 (0.3)	8 (1.0)	42 (2.1)	50 (2.1)
Find out what students thought or already knew about the key mathematical ideas	1 (0.4)	12 (1.4)	49 (2.3)	38 (2.2)
Implement the instructional materials (e.g., mathematics textbook) to be used during this unit	2 (0.7)	7 (1.0)	36 (2.0)	55 (2.0)
Monitor student understanding during this unit	0 (0.0)	6 (1.1)	37 (1.7)	57 (1.9)
Assess student understanding at the conclusion of this unit	0 (0.1)	4 (1.1)	34 (2.1)	62 (2.3)

Table MTQ 53.3
High School Mathematics Classes Taught by Teachers Feeling Prepared for Each of a Number of Tasks in the Most Recent Unit

	PERCENT OF CLASSES			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
Anticipate difficulties that students will have with particular mathematical ideas and procedures in this unit	0 (0.2)	7 (0.9)	33 (1.6)	59 (1.6)
Find out what students thought or already knew about the key mathematical ideas	1 (0.2)	12 (0.9)	40 (1.6)	47 (1.5)
Implement the instructional materials (e.g., mathematics textbook) to be used during this unit	1 (0.4)	7 (0.8)	30 (1.5)	61 (1.6)
Monitor student understanding during this unit	0 (0.1)	4 (0.6)	36 (1.6)	60 (1.6)
Assess student understanding at the conclusion of this unit	0 (0.2)	4 (0.5)	28 (1.4)	68 (1.4)

Table MTQ 54

Duration of the Most Recent Mathematics Lesson

	AVERAGE NUMBER OF MINUTES
Elementary	65 (0.8)
Middle	57 (1.0)
High	61 (0.7)

Table MTQ 55

Average Percentage of Time Spent on Different Activities in the Most Recent Mathematics Lesson, by Grade Range

	AVERAGE PERCENT OF CLASS TIME		
	ELEMENTARY	MIDDLE	HIGH
Non-instructional activities (e.g., attendance taking, interruptions)	8 (0.3)	11 (0.3)	10 (0.2)
Whole class activities (e.g., lectures, explanations, discussions)	35 (0.7)	39 (0.8)	42 (0.7)
Small group work	33 (0.8)	28 (1.0)	26 (0.8)
Students working individually (e.g., reading textbooks, completing worksheets, taking a test or quiz)	24 (0.6)	22 (0.7)	22 (0.7)

Table MTQ 56

Mathematics Classes Participating in Various Activities in the Most Recent Lesson, by Grade Range

	PERCENT OF CLASSES		
	ELEMENTARY	MIDDLE	HIGH
Teacher explaining a mathematical idea to the whole class	89 (1.3)	88 (1.6)	91 (1.0)
Teacher conducting a demonstration while students watched	78 (1.9)	65 (2.1)	64 (1.3)
Whole class discussion	87 (1.5)	78 (1.5)	70 (1.4)
Students working in small groups	87 (1.4)	83 (1.7)	78 (1.2)
Students completing textbook/worksheet problems	77 (1.6)	76 (1.7)	78 (1.4)
Students doing hands-on/manipulative activities	65 (2.1)	24 (1.8)	17 (1.5)
Students reading about mathematics	17 (1.4)	15 (1.5)	15 (1.3)
Students writing about mathematics (does not include students taking notes)	27 (1.6)	19 (1.6)	14 (1.1)
Practicing for standardized tests	13 (1.7)	17 (1.5)	15 (1.0)
Test or quiz	18 (1.8)	15 (1.5)	19 (1.2)
None of the above	0 ---†	0 (0.1)	0 (0.1)

† No elementary school mathematics teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table MTQ 57
Sex of Mathematics Teachers, by Grade Range

	PERCENT OF TEACHERS		
	ELEMENTARY	MIDDLE	HIGH
Female	94 (1.0)	70 (2.2)	60 (1.5)
Male	6 (1.0)	30 (2.2)	40 (1.5)
Other	0 (0.1)	0 ---†	0 (0.1)

† No middle school mathematics teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table MTQ 58
Mathematics Teachers of Hispanic or Latino Origin

	PERCENT OF TEACHERS
Elementary	10 (1.4)
Middle	8 (1.5)
High	7 (1.1)

Table MTQ 59
Race of Mathematics Teachers, by Grade Range

	PERCENT OF TEACHERS		
	ELEMENTARY	MIDDLE	HIGH
American Indian or Alaska Native	1 (0.5)	1 (0.5)	2 (0.3)
Asian	3 (0.7)	3 (0.8)	4 (0.6)
Black or African American	7 (1.0)	8 (1.2)	5 (0.8)
Native Hawaiian or Other Pacific Islander	0 (0.3)	1 (0.8)	1 (0.3)
White	89 (1.3)	89 (1.4)	91 (1.0)

Table MTQ 60
Age of Mathematics Teachers

	MEAN AGE OF TEACHERS
Elementary	42 (0.4)
Middle	42 (0.5)
High	42 (0.3)

High School Computer Science Teacher Questionnaire

High School Computer Science Teacher Questionnaire Tables

2018 NSSME+

High School Computer Science Teacher Questionnaire

Teacher Background and Opinions

1. How many years have you taught prior to this school year: [Enter each response as a whole number (for example: 15).]

a. any subject at the K–12 level?	
b. computer science at the K–12 level?	
c. at this school, any subject?	

2. At what grade levels do you currently teach computer science? [Select all that apply.]

☐	K–5
☐	6–8
☐	9–12
☐	I do not currently teach computer science. *[Teacher ineligible, exit survey]*

3. Omitted – Used only for survey routing.

4. In a typical week, how many different computer science classes (sections) are you currently teaching?
   - If you meet with the *same class of students* multiple times per week, count that class only once.
   - If you teach the *same computer science course* to multiple classes of students, count each class separately.

1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○

5. For each computer science class you currently teach, select the course type and enter the number of students enrolled. Enter the classes in the order that you teach them. For teachers on an alternating day block schedule, please order your classes starting with the first class you teach this week. [Select one course type on each row and enter the number of students as a whole number (for example: 25).]

GRADES 9–12 COURSE TYPE	EXAMPLE COURSES
Computer technology courses that do <u>not</u> include programming	Computer literacy; Keyboarding; Media technology (digital video/audio, multimedia presentations, digital arts); Desktop publishing; Computer applications (word processing, spreadsheets, slide presentations); Computer repair and computer networking; Web design; Computer-aided design (architectural drawing, fashion design)
Introductory high school computer science courses <u>that include programming</u>	Computer Science Discoveries such as code.org; Exploring computer science; Computer Science Essentials such as PLTW; Introductory Programming; IB Computer Science Standard Level
Computer science courses that might qualify for college credit	AP Computer Science A; AP Computer Science Principles; IB Computer Science Higher Level
Specialized/elective computer science courses with programming as a prerequisite	Advanced Computer science electives such as Robotics; Game or mobile app development; or other advanced computer science elective with programming as a prerequisite

CLASS	COURSE TYPE	NUMBER OF STUDENTS ENROLLED
Your 1st computer science class:		
Your 2nd computer science class:		
…		
Your 10th computer science class:		

COURSE TYPE LIST	
1	Computer technology courses that do not include programming
2	Introductory high school computer science courses that include programming
3	Computer science courses that might qualify for college credit
4	Specialized/elective computer science courses with programming as a prerequisite

6. Later in this questionnaire, we will ask you questions about your *[[x^th]]* computer science class, which you indicated was *[[course type indicated in Q5]]*. What is your school's title for this course? ______________

7. Have you been awarded one or more bachelor's and/or graduate degrees in the following fields? (With regard to bachelor's degrees, count only areas in which you majored. Do not include endorsements or certificates.) [Select one on each row.]

		YES	NO
a.	Business	○	○
b.	Computer science	○	○
c.	Education (general or subject specific such as computer science education)	○	○
d.	Information science	○	○
e.	Mathematics	○	○
f.	Natural sciences (for example: Biology, Chemistry, Physics, Earth Sciences)	○	○
g.	Computer engineering	○	○
h.	Electrical engineering	○	○
i.	Other engineering	○	○
j.	Other, please specify.____________	○	○

8. *[Presented only to teachers that selected "Yes" for Q7c]*
What type of education degree do you have? (With regard to bachelor's degrees, count only areas in which you majored.) [Select all that apply.]

□	Computer Science Education
□	Elementary Education
□	Mathematics Education
□	Science Education
□	Other education, please specify. ____________

9. Did you complete one or more computer science courses in each of the following areas at the undergraduate or graduate level? [Select one on each row.]

		YES	NO
a.	Introduction to computer science	○	○
b.	Introduction to programming	○	○
c.	Algorithms (for example: sorting; search trees, heaps, and hashing; divide-and-conquer)	○	○
d.	Artificial intelligence (for example: machine learning, robotics, computer vision)	○	○
e.	Computer graphics (for example: ray tracing, the graphics pipeline, transformations, texture mapping)	○	○
f.	Computer networks (for example: application layer protocols, Internet protocols, network interfaces)	○	○
g.	Database systems (for example: the relational model, relational algebra, SQL)	○	○
h.	Human-computer interaction (for example: human information processing subsystems; libraries of standard graphical user interface objects; methodologies to measure the usability of software)	○	○
i.	Operating systems/computer systems	○	○
j.	Software design/engineering	○	○
k.	Other upper division computer science	○	○

10. Did you complete the following mathematics courses at the undergraduate or graduate level? [Select one on each row.]

		YES	NO
a.	Linear algebra	○	○
b.	Probability	○	○
c.	Statistics	○	○
d.	Number theory (for example: divisibility theorems, properties of prime numbers)	○	○
e.	Discrete mathematics (for example: combinatorics, graph theory, game theory)	○	○

11. Did you complete courses in each of the following areas at the undergraduate or graduate level? [Select one on each row.]

		YES	NO
a.	Computer engineering	○	○
b.	Electrical/Electronics engineering	○	○
c.	Other types of engineering courses	○	○

12. Which of the following best describes the program you completed to earn your teaching credential (sometimes called certification or license)?

○	An undergraduate program leading to a bachelor's degree and a teaching credential
○	A post-baccalaureate credentialing program (no master's degree awarded)
○	A master's program that also led to a teaching credential
○	I have not completed a program to earn a teaching credential. *[Skip to Q14]*

13. In which of the following areas are you certified (have a credential or endorsement) to teach at the high school level? [Select all that apply.]

□	Business
□	Computer science
□	Engineering
□	Mathematics
□	Science (any area)
□	Other

14. After completing your undergraduate degree and prior to becoming a teacher, did you have a full-time job that included computer programming or computer/software engineering?

○	Yes
○	No

Professional Development

The questions in this section ask about your participation in professional development focused on computer science or computer science teaching. When answering these questions, please include:

- face-to-face and/or online courses;
- professional meetings/conferences;
- workshops;
- professional learning communities/lesson studies/teacher study groups; and
- coaching and mentoring.

Do not include:

- courses you took prior to becoming a teacher; and
- time spent providing professional development (including coaching and mentoring) for other teachers.

15. When did you **last participate** in professional development focused on computer science or computer science teaching?

○	In the last 12 months
○	1–3 years ago
○	4–6 years ago
○	7–10 years ago
○	More than 10 years ago
○	Never

} *[Skip to Q20]* (4–6 years ago, 7–10 years ago, More than 10 years ago, Never)

16. **In the last 3 years,** which of the following types of professional development related to computer science or computer science teaching have you had? [Select one on each row.]

		YES	NO
a.	I attended a professional development program/workshop.	○	○
b.	I attended a national, state, or regional computer science teacher association meeting.	○	○
c.	I completed an online course/webinar.	○	○
d.	I participated in a professional learning community/lesson study/teacher study group.	○	○
e.	I received assistance or feedback from a formally designated coach/mentor.	○	○
f.	I took a formal course for college credit.	○	○

17. What is the **total** amount of time you have spent on professional development related to computer science or computer science teaching **in the last 3 years**?

○	Less than 6 hours
○	6–15 hours
○	16–35 hours
○	36–80 hours
○	More than 80 hours

18. Considering all of your computer science-related professional development **in the last 3 years**, to what extent does each of the following describe your experiences? [Select one on each row.]

		NOT AT ALL		SOMEWHAT		TO A GREAT EXTENT
a.	I had opportunities to engage in activities to learn computer science content.	①	②	③	④	⑤
b.	I had opportunities to experience lessons, as my students would, from the textbook/units I use in my classroom.	①	②	③	④	⑤
c.	I had opportunities to examine classroom artifacts (for example: student work samples, e-portfolios, videos of classroom instruction).	①	②	③	④	⑤
d.	I had opportunities to rehearse instructional practices during the professional development (meaning: try out, receive feedback, and reflect on those practices).	①	②	③	④	⑤
e.	I had opportunities to apply what I learned to my classroom and then come back and talk about it as part of the professional development.	①	②	③	④	⑤
f.	I worked closely with other teachers from my school.	①	②	③	④	⑤
g.	I worked closely with other teachers who taught the same grade and/or subject whether or not they were from my school.	①	②	③	④	⑤

19. Thinking about all of your computer science-related professional development **in the last 3 years**, to what extent was each of the following emphasized? [Select one on each row.]

		NOT AT ALL		SOMEWHAT		TO A GREAT EXTENT
a.	Deepening your own computer science content knowledge, including programming	①	②	③	④	⑤
b.	Deepening your understanding of how computer science is done (for example: breaking problems into smaller parts, considering the needs of a user, creating computational artifacts)	①	②	③	④	⑤
c.	Implementing the computer science textbook/online course to be used in your classroom	①	②	③	④	⑤
d.	Learning how to use programming activities that require a computer	①	②	③	④	⑤
e.	Learning about difficulties that students may have with particular computer science ideas and/or practices	①	②	③	④	⑤
f.	Monitoring student understanding during computer science instruction					
g.	Differentiating computer science instruction to meet the needs of diverse learners	①	②	③	④	⑤
h.	Incorporating students' cultural backgrounds into computer science instruction	①	②	③	④	⑤
i.	Learning how to provide computer science instruction that integrates engineering, mathematics, and/or science	①	②	③	④	⑤

Preparedness to Teach Computer Science

20. Within computer science, many teachers feel better prepared to teach some topics than others. How prepared do you feel to teach each of the following topics **at the grade level(s) you teach,** whether or not they are currently included in your teaching responsibilities? [Select one on each row.]

	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
a. Computing systems	①	②	③	④
b. Networks and the Internet	①	②	③	④
c. Data and analysis	①	②	③	④
d. Algorithms and programming	①	②	③	④
e. Impacts of computing	①	②	③	④

21. How well prepared do you feel to do each of the following in your computer science instruction? [Select one on each row.]

	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
a. Develop students' conceptual understanding of the computer science ideas you teach	①	②	③	④
b. Develop students' abilities to do computer science (for example: breaking problems into smaller parts, considering the needs of a user, creating computational artifacts)	①	②	③	④
c. Develop students' awareness of STEM careers	①	②	③	④
d. Provide computer science instruction that is based on students' ideas (whether completely correct or not) about the topics you teach	①	②	③	④
e. Use formative assessment to monitor student learning	①	②	③	④
f. Differentiate computer science instruction to meet the needs of diverse learners	①	②	③	④
g. Incorporate students' cultural backgrounds into computer science instruction	①	②	③	④
h. Encourage students' interest in computer science	①	②	③	④
i. Encourage participation of all students in computer science	①	②	③	④

Opinions about Computer Science Instruction

22. Please provide your opinion about each of the following statements. [Select one on each row.]

		STRONGLY DISAGREE	DISAGREE	NO OPINION	AGREE	STRONGLY AGREE
a.	Students learn computer science best in classes with students of similar abilities.	①	②	③	④	⑤
b.	It is better for computer science instruction to focus on ideas in depth, even if that means covering fewer topics.	①	②	③	④	⑤
c.	At the beginning of instruction on a computer science idea, students should be provided with definitions for new vocabulary that will be used.	①	②	③	④	⑤
d.	Most class periods should provide opportunities for students to share their thinking and reasoning.	①	②	③	④	⑤
e.	Hands-on/manipulatives/programming activities should be used primarily to reinforce a computer science idea that the students have already learned.	①	②	③	④	⑤
f.	Teachers should ask students to justify their solutions to a computational problem.	①	②	③	④	⑤
g.	Students learn best when instruction is connected to their everyday lives.	①	②	③	④	⑤
h.	Most class periods should provide opportunities for students to apply computer science ideas to real-world contexts.	①	②	③	④	⑤
i.	Students should learn computer science by doing computer science (for example: breaking problems into smaller parts, considering the needs of a user, creating computational artifacts).	①	②	③	④	⑤

Leadership Experiences

23. **In the last 3 years** have you… [Select one on each row.]

		YES	NO
a.	Served as a lead teacher or department chair?	○	○
b.	Served as a ***formal*** mentor or coach for a computer science teacher? (Do not include supervision of student teachers.)	○	○
c.	Supervised a student teacher in your classroom?	○	○
d.	Served on a school or district/diocese-wide computer science committee (for example: developing curriculum, developing pacing guides, selecting instructional materials)?	○	○
e.	Led or co-led a workshop or professional learning community (for example: teacher study group, lesson study) for other teachers focused on computer science or computer science teaching?	○	○
f.	Taught a computer science lesson for other teachers to observe?	○	○
g.	Observed another teacher's computer science lesson for the purpose of giving him/her feedback?	○	○

Your Computer Science Instruction

The rest of this questionnaire is about your *[[xth]]*computer science class, which you indicated was *[[type indicated in Q5]]* and is titled *[[title provided in Q6]]*.

24. On average, how many minutes per week does this class meet? [Enter your response as a whole number (for example: 300).] __________

25. Enter the number of students for each grade represented in this class. [Enter each response as a whole number (for example: 15).]

9th grade	
10th grade	
11th grade	
12th grade	
Other	

26. For the students in this class, indicate the number of males and females in each of the following categories of race/ethnicity. [Enter each response as a whole number (for example: 15).]

	MALES	FEMALES
a. American Indian or Alaskan Native		
b. Asian		
c. Black or African American		
d. Hispanic or Latino		
e. Native Hawaiian or Other Pacific Islander		
f. White		
g. Two or more races		

27. Which of the following best describes the prior achievement levels of the students in this class relative to other students in this school?

○	Mostly low achievers
○	Mostly average achievers
○	Mostly high achievers
○	A mixture of levels

28. How much control do you have over each of the following for computer science instruction in this class? [Select one on each row.]

		NO CONTROL		MODERATE CONTROL		STRONG CONTROL
a.	Determining course goals and objectives	①	②	③	④	⑤
b.	Selecting curriculum materials (for example: textbooks/online courses)	①	②	③	④	⑤
c.	Selecting content, topics, and skills to be taught	①	②	③	④	⑤
d.	Selecting programming languages to use	①	②	③	④	⑤
e.	Selecting the sequence in which topics are covered	①	②	③	④	⑤
f.	Determining the amount of instructional time to spend on each topic	①	②	③	④	⑤
g.	Selecting teaching techniques	①	②	③	④	⑤
h.	Determining the amount of homework to be assigned	①	②	③	④	⑤
i.	Choosing criteria for grading student performance	①	②	③	④	⑤

29. Think about your plans for this class for the entire course. By the end of the course, how much emphasis will each of the following student objectives receive? [Select one on each row.]

		NONE	MINIMAL EMPHASIS	MODERATE EMPHASIS	HEAVY EMPHASIS
a.	Learning computer science vocabulary and/or program syntax	①	②	③	④
b.	Understanding computer science concepts	①	②	③	④
c.	Learning how to do computer science (for example: breaking problems into smaller parts, considering the needs of a user, creating computational artifacts)	①	②	③	④
d.	Learning how to develop computational solutions	①	②	③	④
e.	Learning about real-life applications of computer science	①	②	③	④
f.	Increasing students' interest in computer science	①	②	③	④
g.	Developing students' confidence that they can successfully pursue careers in computer science	①	②	③	④

30. How often do **you** do each of the following in your computer science instruction in this class? [Select one on each row.]

		NEVER	RARELY (FOR EXAMPLE: A FEW TIMES A YEAR)	SOMETIMES (FOR EXAMPLE: ONCE OR TWICE A MONTH)	OFTEN (FOR EXAMPLE: ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL COMPUTER SCIENCE LESSONS
a.	Explain computer science ideas to the whole class	①	②	③	④	⑤
b.	Engage the whole class in discussions	①	②	③	④	⑤
c.	Have students work in small groups	①	②	③	④	⑤
d.	Have students do hands-on/manipulative programming activities that do not require a computer	①	②	③	④	⑤
e.	Have students work on programming activities using a computer	①	②	③	④	⑤
f.	Use flipped instruction (have students watch lectures/demonstrations outside of class to prepare for in-class activities)	①	②	③	④	⑤
g.	Have students read from a textbook/online course in class, either aloud or to themselves	①	②	③	④	⑤
h.	Have students explain and justify their method for solving a problem	①	②	③	④	⑤
i.	Have students present their solution strategies to the rest of the class	①	②	③	④	⑤
j.	Have students compare and contrast different methods for solving a problem	①	②	③	④	⑤
k.	Have students write their reflections (for example: in their journals, on exit tickets) in class or for homework	①	②	③	④	⑤
l.	Focus on literacy skills (for example: informational reading or writing strategies)	①	②	③	④	⑤

31. How often do you have **students** do each of the following in this class? [Select one on each row.]

	NEVER	RARELY (FOR EXAMPLE: A FEW TIMES A YEAR)	SOMETIMES (FOR EXAMPLE: ONCE OR TWICE A MONTH)	OFTEN (FOR EXAMPLE: ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL COMPUTER SCIENCE LESSONS
a. Create computational artifacts (for example: programs, simulations, visualizations, digital animations, robotic systems, or apps)	①	②	③	④	⑤
b. Create a computational artifact designed to be used by someone outside the class or other students	①	②	③	④	⑤
c. Provide feedback on other students' computational products or designs	①	②	③	④	⑤
d. Get input on computational products or designs from people with different perspectives (do not include feedback that you give students)	①	②	③	④	⑤
e. Systematically use test cases to verify program performance and/or identify problems	①	②	③	④	⑤
f. Identify real-world problems that might be solved computationally	①	②	③	④	⑤
g. Consider how a program they are creating can be separated into modules/procedures/objects	①	②	③	④	⑤
h. Identify and adapt existing code to solve a new computational problem	①	②	③	④	⑤
i. Use computational methods to simulate events or processes (for example: rolling dice, supply and demand)	①	②	③	④	⑤
j. Analyze datasets using a computer to detect patterns	①	②	③	④	⑤
k. Write comments within code to document purposes or features	①	②	③	④	⑤
l. Create instructions for an end-user explaining how to use a computational artifact	①	②	③	④	⑤
m. Explain computational solution strategies verbally or in writing	①	②	③	④	⑤
n. Compare and contrast the strengths and limitations of different representations such as flow charts, tables, code, or pictures	①	②	③	④	⑤

32. Which best describes how each of the following devices (if required) is provided for this computer science class? [Select one on each row.]

	NOT REQUIRED FOR THIS CLASS	PROVIDED BY THE SCHOOL, AND STUDENTS ARE NOT ALLOWED TO USE THEIR OWN	PROVIDED BY THE SCHOOL, BUT STUDENTS ARE ALLOWED TO USE THEIR OWN	STUDENTS ARE EXPECTED TO PROVIDE THEIR OWN, BUT THE SCHOOL HAS SOME AVAILABLE FOR USE	STUDENTS ARE REQUIRED TO PROVIDE THEIR OWN
a. Computers (desktops or laptops)	○	○	○	○	○
b. Mobile computing devices (tablets or smartphones)	○	○	○	○	○
c. Data storage devices	○	○	○	○	○

33. Please indicate the availability of each of the following for your computer science instruction in this class. [Select one on each row.]

	ALWAYS AVAILABLE IN YOUR CLASSROOM	AVAILABLE UPON REQUEST	NOT AVAILABLE
a. Probes for collecting data (for example: motion sensors, temperature probes)	○	○	○
b. Projection devices (for example: Smartboard, document camera, LCD projector)	○	○	○
c. Robotics equipment	○	○	○

34. In a typical week, how much time outside of this class are students expected to spend on computer science assignments?

○	None
○	1–15 minutes per week
○	16–30 minutes per week
○	31–60 minutes per week
○	61–90 minutes per week
○	91–120 minutes per week
○	More than 2 hours per week

This next item asks about different types of instructional materials; please read the entire list of materials before answering

35. Thinking about your instruction in this class over the entire year, about how often is instruction based on materials from each of the following sources? [Select one on each row.]

	NEVER	RARELY (FOR EXAMPLE: A FEW TIMES A YEAR)	SOMETIMES (FOR EXAMPLE: ONCE OR TWICE A MONTH)	OFTEN (FOR EXAMPLE: ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL COMPUTER SCIENCE LESSONS
a. Commercially published textbooks (printed or electronic), including the supplementary materials (for example: worksheets) that accompany the textbooks	①	②	③	④	⑤
b. State, county, or district/diocese-developed units or lessons	①	②	③	④	⑤
c. Online units or courses that students work through at their own pace (for example: MOOCs, EdX, IMACS)	①	②	③	④	⑤
d. Lessons or resources from websites that have a subscription fee or per lesson cost (for example: BrainPOP, Discovery Ed, Teachers Pay Teachers)	①	②	③	④	⑤
e. Lessons or resources from websites that are free (for example: Khan Academy, code.org)	①	②	③	④	⑤
f. Units or lessons you created (either by yourself or with others)	①	②	③	④	⑤
g. Units or lessons you collected from any other source (for example: conferences, journals, colleagues, university or museum partners)	①	②	③	④	⑤

36. Does your school/district/diocese designate instructional materials (textbooks, units, or lessons) to be used in this class?

○	Yes
○	No *[Skip to 39]*

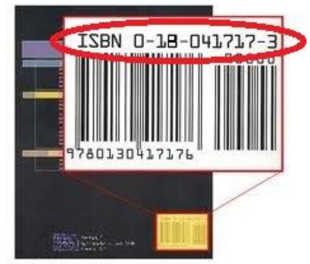
37. Which of the following types of instructional materials does your school/district/diocese designate to be used in this class? [Select all that apply.]

☐	Commercially published textbooks (printed or electronic), including the supplementary materials (for example: worksheets) that accompany the textbooks
☐	State, county, or district/diocese-developed instructional materials
☐	Online units or courses that students work through at their own pace (for example: MOOCs, EdX, IMACS)
☐	Lessons or resources from websites that have a subscription fee or per lesson cost (for example: BrainPOP, Discovery Ed, Teachers Pay Teachers)
☐	Lessons or resources from websites that are free (for example: Khan Academy, code.org)

38. Omitted – Used only for survey routing.

39. ***[Presented only to teachers who selected "Sometimes" "Often" or "All" for Q35a or c]***

[Version for teachers who indicate using a commercial textbook most often] Please indicate the title, author, most recent copyright year, and ISBN code of the commercially published textbook (printed or electronic) used <u>most often</u> by the students in this class.



- The 10- or 13-character ISBN code can be found on the copyright page and/or the back cover of the textbook.
- Do not include the dashes when entering the ISBN.
- Example ISBN:

[Version for teachers who indicate using an online course most often] Please indicate the title and URL of the online units or courses used <u>most often</u> by the students in this class.

Title:	
First Author: [for teachers who indicate using a commercial textbook most often]	
Year: [for teachers who indicate using a commercial textbook most often]	
ISBN: [for teachers who indicate using a commercial textbook most often]	
URL: [for teachers who indicate using an online program most often]	

40. ***[Presented only to teachers who did not select "Never" for Q35d or e]***

Please indicate up to 3 online sources of lessons/activities that you use most frequently in this class. Enter only the host/domain name, for example: www.myfavoriteCSsite.net

URL:	
URL:	
URL:	

41. Please rate how each of the following affects your computer science instruction in this class. [Select one on each row.]

		INHIBITS EFFECTIVE INSTRUCTION		NEUTRAL OR MIXED		PROMOTES EFFECTIVE INSTRUCTION	N/A
a.	Current state standards	①	②	③	④	⑤	○
b.	Textbook selection policies	①	②	③	④	⑤	○
c.	Teacher evaluation policies	①	②	③	④	⑤	○
d.	College entrance requirements	①	②	③	④	⑤	○
e.	Students' prior knowledge and skills	①	②	③	④	⑤	○
f.	Students' motivation, interest, and effort in computer science	①	②	③	④	⑤	○
g.	Parent/guardian expectations and involvement	①	②	③	④	⑤	○
h.	Principal support	①	②	③	④	⑤	○
i.	Amount of time for you to plan, individually and with colleagues	①	②	③	④	⑤	○
j.	Amount of time available for your professional development	①	②	③	④	⑤	○

42. In your opinion, how great a problem is each of the following for your computer science instruction in this class? [Select one on each row.]

		NOT A SIGNIFICANT PROBLEM	SOMEWHAT OF A PROBLEM	SERIOUS PROBLEM
a.	Lack of reliable access to the Internet	①	②	③
b.	Lack of functioning computing devices (for example: desktop computers, laptop computers, tablets, smartphones)	①	②	③
c.	Insufficient power sources for devices (for example: electrical outlets, charging stations)	①	②	③
d.	Lack of support to maintain technology (for example: repair broken devices, install software)	①	②	③
e.	School restrictions on Internet content that is allowed	①	②	③

Your Most Recently Completed Computer Science Unit in this Class

The questions in this section are about the most recently completed computer science unit in this class which you indicated is *[[type indicated in Q5]]* and is titled *[[title provided in Q6]]*.

- Depending on the structure of your class and the instructional materials you use, a unit may range from a few to many class periods.
- Do not be concerned if this unit was not typical of your instruction.

43. Which of the following best describes the content focus of this unit?

○	Computing systems
○	Networks and the Internet
○	Data and analysis
○	Algorithms and programming
○	Impacts of computing

44. ***[Presented only to teachers who selected "Sometimes" "Often" or "All" for Q35a or b]*** Was this unit based primarily on a commercially published textbook/online course or state, county, or district/diocese-developed materials?

○	Yes
○	No ***[Skip to Q47]***

This next set of items is about the textbook or state, county, or district/diocese-developed lessons you used in this unit.

45. Please indicate the extent to which you did each of the following while teaching this unit. [Select one on each row.]

		NOT AT ALL		SOMEWHAT		TO A GREAT EXTENT
a.	I used these materials to guide the structure and content emphasis of the unit.	①	②	③	④	⑤
b.	I picked what is important from these materials and skipped the rest.	①	②	③	④	⑤
c.	I incorporated activities (for example: problems, investigations, readings) from other sources to supplement what these materials were lacking.	①	②	③	④	⑤
d.	I modified activities from these materials.	①	②	③	④	⑤

46. ***[Presented only to teachers who did not select "Not at all" for Q45b]*** During this unit, when you skipped activities (for example: problems, programming activities, readings) in these materials, how much was each of the following a factor in your decisions? [Select one on each row.]

		NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
a.	The computer science ideas addressed in the activities I skipped are not included in my pacing guide/standards.	①	②	③
b.	I did not have the materials needed to implement the activities I skipped.	①	②	③
c.	I did not have the knowledge needed to implement the activities I skipped.			
d.	The activities I skipped were too difficult for my students.	①	②	③
e.	My students already knew the computer science ideas or were able to learn them without the activities I skipped.	①	②	③
f.	I have different activities for those computer science ideas that work better than the ones I skipped.	①	②	③
g.	I did not have enough instructional time for the activities I skipped.	①	②	③

47. *[Presented only to teachers who did not select "Not at all" for Q45c]*
During this unit, when you supplemented these materials with additional activities, how much was each of the following a factor in your decisions? [Select one on each row.]

		NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
a.	My pacing guide indicated that I should use supplemental activities.	①	②	③
b.	Supplemental activities were needed to prepare students for standardized tests.	①	②	③
c.	Supplemental activities were needed to provide students with additional practice.	①	②	③
d.	Supplemental activities were needed so students at different levels of achievement could increase their understanding of the ideas targeted in each activity.	①	②	③
e.	I had additional activities that I liked.	①	②	③

48. *[Presented only to teachers who did not select "Not at all" for Q45d]*
During this unit, when you modified activities from these materials, how much was each of the following a factor in your decisions? [Select one on each row.]

		NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
a.	I did not have the necessary materials/supplies for the original activities.	①	②	③
b.	The original activities were too difficult conceptually for my students.	①	②	③
c.	The original activities were too easy conceptually for my students.	①	②	③
d.	I did not have enough instructional time to implement the activities as designed.	①	②	③
e.	The original activities were too structured for my students.	①	②	③
f.	The original activities were not structured enough for my students.	①	②	③

49. How well prepared did you feel to do each of the following as part of your instruction on this particular unit? [Select one on each row.]

		NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
a.	Anticipate difficulties that students may have with particular computer science ideas and procedures in this unit	①	②	③	④
b.	Find out what students thought or already knew about the key computer science ideas	①	②	③	④
c.	Implement the instructional materials (for example: textbook, online course) to be used during this unit	①	②	③	④
d.	Monitor student understanding during this unit	①	②	③	④
e.	Assess student understanding at the conclusion of this unit	①	②	③	④

Your Most Recent Computer Science Lesson in this Class

The next three questions refer to the most recent computer science lesson in this class, which you indicated is *[[type indicated in Q5]]* and is titled *[[title provided in Q6]]*, even if it included activities and/or interruptions that are not typical (for example: a test, students working on projects, a fire drill). If the lesson spanned multiple days, please answer for the most recent day.

50. How many minutes was that day's computer science lesson? Answer for the entire length of the class period, even if there were interruptions. [Enter your response as a non-zero whole number (for example: 50).] ____________________

51. Of these *[[answer to Q50]]* minutes, how many were spent on the following: [Enter each response as a whole number (for example: 15).]

a.	Non-instructional activities (for example: attendance taking, interruptions)	
b.	Whole class activities (for example: lectures, explanations, discussions)	
c.	Small group work	
d.	Students working individually (for example: reading textbooks, programming, taking a test or quiz)	

52. Which of the following activities took place during that day's computer science lesson? [Select all that apply.]

□	Teacher explaining a computer science idea to the whole class
□	Teacher conducting a demonstration while students watched
□	Whole class discussion
□	Students working in small groups
□	Students completing textbook/worksheet problems
□	Students doing hands-on/manipulative programming activities not using a computer
□	Students working on programming tasks using a computer
□	Students reading about computer science
□	Students writing about computer science (do not include students taking notes)
□	Test or quiz
□	None of the above

Demographic Information

53. Are you:

○	Female
○	Male
○	Other

54. Are you of Hispanic or Latino origin?

○	Yes
○	No

55. What is your race? [Select all that apply.]

☐	American Indian or Alaskan Native
☐	Asian
☐	Black or African American
☐	Native Hawaiian or Other Pacific Islander
☐	White

56. In what year were you born? [Enter your response as a whole number (for example: 1969).]

____

Thank you!

High School Computer Science Teacher Questionnaire Tables

Table CTQ 1
Number of Years High School Computer Science Teachers Spent Teaching Prior to This School Year

	MEAN NUMBER OF YEARS
Any subject at the K–12 level	12 (0.6)
Computer science at the K–12 level	6 (0.5)
At this school, any subject	8 (0.5)

There is no table for CTQ 2.

There is no table for CTQ 3.

Table CTQ 4
Number of Sections of Computer Science Classes Taught Per Week by High School Teachers

	PERCENT OF TEACHERS
1 Section	26 (3.2)
2 Sections	25 (3.4)
3 Sections	20 (3.4)
4 Sections	10 (2.2)
5 Sections	10 (2.8)
6 Sections	6 (1.4)
7 Sections	1 (0.6)
8 Sections	1 (0.7)
9 Sections	0 ---†
10 Sections	0 (0.2)

† No high school computer science teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

There is no table for CTQ 5.

There is no table for CTQ 6.

Table CTQ 7
Subjects of High School Computer Science Teachers' Degrees

	PERCENT OF TEACHERS
Business	23 (2.8)
Computer science	19 (3.1)
Education (general or subject specific such as computer science education)	51 (4.1)
Information science	4 (1.7)
Mathematics	27 (3.2)
Natural sciences (e.g., Biology, Chemistry, Physics, Earth Sciences)	10 (2.5)
Computer engineering	1 (0.5)
Electrical engineering	5 (2.0)
Other engineering	5 (1.9)
Other subject	26 (3.7)

Table CTQ 8
High School Computer Science Teachers With Education Degrees

	PERCENT OF TEACHERS
Computer Science Education	4 (2.1)
Elementary Education	4 (1.3)
Mathematics Education	16 (2.6)
Science Education	4 (1.6)
Other Education	29 (3.4)

Table CTQ 9
Computer Science College Courses Completed by High School Computer Science Teachers

	PERCENT OF TEACHERS
Introduction to computer science	76 (3.0)
Introduction to programming	80 (2.8)
Algorithms (e.g., sorting; search trees, heaps, and hashing; divide-and-conquer)	50 (3.8)
Artificial intelligence (e.g., machine learning, robotics, computer vision)	14 (2.7)
Computer graphics (e.g., ray tracing, the graphics pipeline, transformations, texture mapping)	22 (3.6)
Computer networks (e.g., application layer protocols, Internet protocols, network interfaces)	32 (3.7)
Database systems (e.g., the relational model, relational algebra, SQL)	38 (3.7)
Human-computer interaction (e.g., human information processing subsystems; libraries of standard graphical user interface objects; methodologies to measure the usability of software)	17 (3.2)
Operating systems/Computer systems	45 (3.5)
Software design/engineering	35 (3.1)
Other upper division computer science	39 (3.9)

Table CTQ 10
Mathematics College Courses Completed by High School Computer Science Teachers

	PERCENT OF TEACHERS
Linear algebra	72 (3.0)
Probability	59 (3.3)
Statistics	84 (2.7)
Number theory (e.g., divisibility theorems, properties of prime numbers)	44 (3.6)
Discrete mathematics (e.g., combinatorics, graph theory, game theory)	44 (4.1)

Table CTQ 11
Engineering College Courses Completed by High School Computer Science Teachers

	PERCENT OF TEACHERS
Computer engineering	19 (2.9)
Electrical/Electronics engineering	19 (3.3)
Other types of engineering courses	23 (3.6)

Table CTQ 12
High School Computer Science Teachers' Paths to Certification

	PERCENT OF TEACHERS
An undergraduate program leading to a bachelor's degree and a teaching credential	38 (3.7)
A post-baccalaureate credentialing program (no master's degree awarded)	24 (3.2)
A master's program that also led to a teaching credential	22 (2.8)
I have not completed a program to earn a teaching credential.	16 (2.7)

Table CTQ 13
High School Computer Science Teachers' Areas of Certification

	PERCENT OF TEACHERS
Business	28 (2.4)
Computer science	44 (3.6)
Engineering	10 (2.4)
Mathematics	34 (3.4)
Science (any area)	9 (2.3)
Other	23 (3.0)

Table CTQ 14
High School Computer Science Teachers With Full-Time Job Experience in Computer Programming or Computer/Software Engineering Prior to Teaching

	PERCENT OF TEACHERS
Full-time job experience in their designated field prior to teaching	35 (4.3)

Table CTQ 15
High School Computer Science Teachers' Most Recent Participation in Computer Science-Focused Professional Development

	PERCENT OF TEACHERS
In the last 12 months	64 (3.8)
1–3 years ago	18 (2.7)
4–6 years ago	4 (1.2)
7–10 years ago	2 (1.4)
More than 10 years ago	1 (0.6)
Never	11 (2.7)

Table CTQ 16
High School Computer Science Teachers Participating in Various Computer Science-Focused Professional Development Activities in the Last Three Years

	PERCENT OF TEACHERS†
I attended a professional development program/workshop.	88 (2.4)
I attended a national, state, or regional computer science teacher association meeting.	35 (3.9)
I completed an online course/webinar.	59 (4.7)
I participated in a professional learning community/lesson study/teacher study group.	62 (3.8)
I received assistance or feedback from a formally designated coach/mentor.	29 (3.7)
I took a formal course for college credit.	20 (3.1)

† Includes only high school computer science teachers indicating in Q15 that they participated in computer science-focused professional development in the last three years.

Table CTQ 17
Time Spent by High School Computer Science Teachers on Computer Science-Focused Professional Development in the Last Three Years

	PERCENT OF TEACHERS†
Less than 6 hours	4 (1.3)
6–15 hours	10 (2.4)
16–35 hours	20 (2.6)
36–80 hours	29 (3.5)
More than 80 hours	36 (3.7)

† Includes only high school computer science teachers indicating in Q15 that they participated in computer science-focused professional development in the last three years.

Table CTQ 18
High School Computer Science Teachers' Descriptions of Computer Science-Focused Professional Development in the Last Three Years

	PERCENT OF TEACHERS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
I had opportunities to engage in activities to learn computer science content.	3 (2.0)	2 (0.9)	18 (2.6)	29 (3.5)	47 (3.7)
I had opportunities to experience lessons, as my students would, from the textbook/units I use in my classroom.	9 (2.7)	9 (2.0)	20 (3.0)	19 (2.9)	43 (4.1)
I had opportunities to examine classroom artifacts (e.g., student work samples, e-portfolios, videos of classroom instruction).	14 (2.4)	12 (2.7)	28 (4.4)	27 (3.5)	19 (3.1)
I had opportunities to rehearse instructional practices during the professional development (i.e., try out, receive feedback, and reflect on those practices).	28 (3.8)	16 (2.5)	25 (2.6)	14 (2.6)	18 (3.1)
I had opportunities to apply what I learned to my classroom and then come back and talk about it as part of the professional development.	25 (3.8)	16 (2.9)	20 (3.4)	18 (2.8)	22 (3.3)
I worked closely with other teachers from my school.	42 (4.8)	17 (2.4)	15 (3.4)	13 (3.1)	13 (2.6)
I worked closely with other teachers who taught the same grade and/or subject whether or not they were from my school.	15 (2.8)	15 (3.2)	19 (3.5)	23 (3.1)	28 (3.8)

† Includes only high school teachers indicating in Q15 that they participated in computer science-focused professional development in the last three years.

Table CTQ 19
High School Computer Science Teachers' Perceptions of Topics Emphasized During Professional Development in the Last Three Years

	PERCENT OF TEACHERS†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
Deepening your own computer science content knowledge, including programming	4 (2.1)	5 (1.4)	21 (3.0)	28 (3.1)	42 (3.9)
Deepening your understanding of how computer science is done (e.g., breaking problems into smaller parts, considering the needs of a user, creating computational artifacts)	5 (1.3)	10 (2.0)	22 (3.1)	30 (3.0)	33 (3.7)
Implementing the computer science textbook/online course to be used in your classroom	15 (2.9)	15 (3.2)	20 (3.3)	22 (2.9)	28 (3.9)
Learning how to use programming activities that require a computer	5 (1.4)	10 (2.7)	22 (3.2)	27 (3.8)	36 (3.9)
Learning about difficulties that students may have with particular computer science ideas and/or practices	13 (3.0)	15 (2.7)	24 (2.8)	26 (3.5)	22 (3.8)
Monitoring student understanding during computer science instruction	14 (2.7)	20 (3.0)	26 (4.2)	23 (3.3)	17 (3.5)
Differentiating computer science instruction to meet the needs of diverse learners	15 (2.6)	29 (4.0)	27 (3.1)	18 (3.1)	11 (3.0)
Incorporating students' cultural backgrounds into computer science instruction	31 (3.6)	18 (3.0)	26 (3.7)	13 (2.4)	12 (3.1)
Learning how to provide computer science instruction that integrates engineering, mathematics, and/or science	14 (2.4)	18 (2.8)	32 (3.8)	21 (3.1)	14 (2.7)

† Includes only high school teachers indicating in Q15 that they participated in computer science-focused professional development in the last three years.

Table CTQ 20
High School Computer Science Teachers' Perceptions of Their Preparedness to Teach Various Topics

	PERCENT OF TEACHERS			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
Computing systems	7 (1.4)	28 (3.2)	35 (3.5)	31 (3.9)
Networks and the Internet	11 (2.1)	35 (4.1)	31 (3.6)	23 (3.4)
Data and analysis	9 (1.9)	24 (2.5)	39 (3.6)	27 (4.1)
Algorithms and programming	5 (1.6)	14 (2.0)	34 (4.1)	47 (4.0)
Impacts of computing	6 (1.7)	19 (2.5)	40 (3.7)	35 (3.4)

Table CTQ 21
High School Computer Science Teachers' Perceptions of Their Preparedness for Each of a Number of Tasks

	PERCENT OF TEACHERS			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
Develop students' conceptual understanding of the computer science ideas you teach	2 (0.8)	11 (2.1)	45 (3.9)	42 (3.6)
Develop students' abilities to do computer science (e.g., breaking problems into smaller parts, considering the needs of a user, creating computational artifacts)	1 (0.7)	15 (2.5)	36 (3.4)	48 (3.7)
Develop students' awareness of STEM careers	3 (1.8)	21 (2.9)	40 (4.7)	36 (4.2)
Provide computer science instruction that is based on students' ideas (whether completely correct or not) about the topics you teach	7 (2.2)	22 (3.6)	43 (4.7)	28 (3.9)
Use formative assessment to monitor student learning	2 (0.6)	19 (2.7)	44 (3.7)	35 (3.4)
Differentiate computer science instruction to meet the needs of diverse learners	11 (2.4)	35 (3.8)	32 (3.5)	21 (3.3)
Incorporate students' cultural backgrounds into computer science instruction	20 (2.9)	39 (3.6)	25 (3.6)	16 (3.1)
Encourage students' interest in computer science	2 (1.2)	8 (1.6)	41 (3.6)	49 (3.6)
Encourage participation of all students in computer science	3 (1.5)	15 (3.1)	36 (3.8)	45 (3.8)

Table CTQ 22
High School Computer Science Teachers' Opinions About Teaching and Learning

	PERCENT OF TEACHERS				
	STRONGLY DISAGREE	DISAGREE	NO OPINION	AGREE	STRONGLY AGREE
Students learn computer science best in classes with students of similar abilities.	3 (1.3)	34 (3.3)	12 (2.1)	35 (3.1)	15 (2.5)
It is better for computer science instruction to focus on ideas in depth, even if that means covering fewer topics.	1 (1.0)	20 (2.6)	20 (3.4)	45 (4.1)	13 (2.9)
At the beginning of instruction on a computer science idea, students should be provided with definitions for new vocabulary that will be used.	1 (0.4)	11 (2.0)	13 (2.4)	52 (3.6)	23 (3.2)
Most class periods should provide opportunities for students to share their thinking and reasoning.	0 ---†	3 (0.8)	7 (2.5)	54 (4.2)	36 (4.2)
Hands-on/manipulatives/programming activities should be used primarily to reinforce a computer science idea that the students have already learned.	2 (0.9)	15 (2.8)	11 (2.8)	35 (3.2)	36 (3.6)
Teachers should ask students to justify their solutions to a computational problem.	0 (0.3)	2 (0.7)	6 (1.4)	60 (3.9)	32 (3.7)
Students learn best when instruction is connected to their everyday lives.	0 ---†	2 (0.8)	8 (1.8)	49 (3.9)	40 (4.1)
Most class periods should provide opportunities for students to apply computer science ideas to real-world contexts.	0 ---†	4 (1.3)	17 (2.7)	46 (4.1)	33 (4.3)
Students should learn computer science by doing computer science (e.g., breaking problems into smaller parts, considering the needs of a user, creating computational artifacts).	0 ---†	0 ---†	3 (1.2)	34 (4.0)	63 (4.2)

† No high school computer science teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table CTQ 23
High School Computer Science Teachers Having Various Leadership Responsibilities Within the Last Three Years

	PERCENT OF TEACHERS
Served as a lead teacher or department chair	36 (3.6)
Served as a formal mentor or coach for a computer science teacher	10 (2.2)
Supervised a student teacher in your classroom	15 (2.6)
Served on a school district-wide/diocese-wide computer science committee (e.g., developing curriculum, developing pacing guides, selecting instructional materials)	39 (4.0)
Led or co-led a workshop or professional learning community (e.g., teacher study group, lesson study) for other teachers focused on computer science or computer science teaching	22 (3.1)
Taught a computer science lesson for other teachers to observe	36 (3.7)
Observed another teacher's computer science lesson for the purpose of giving him/her feedback	17 (2.7)

Table CTQ 24
Average Minutes Per Week High School Computer Science Classes Meet

	AVERAGE NUMBER OF MINUTES
Instructional time per week	241 (5.2)

Table CTQ 25
Average Number of Students in High School Computer Science Classes

	AVERAGE NUMBER OF STUDENTS
High school computer science classes	17 (0.8)

Table CTQ 26
Race/Ethnicity of Students in High School Computer Science Classes

	AVERAGE PERCENT OF STUDENTS
American Indian or Alaskan Native	0 (0.1)
Asian	13 (1.9)
Black or African American	8 (1.3)
Hispanic or Latino	16 (2.8)
Native Hawaiian or Other Pacific Islander	1 (0.5)
White	59 (2.9)
Two or more races	3 (0.8)

Table CTQ 27
Prior Achievement Level of Students in High School Computer Science Classes

	PERCENT OF STUDENTS
Mostly low achievers	0 (0.4)
Mostly average achievers	23 (2.8)
Mostly high achievers	36 (4.4)
A mixture of levels	41 (4.4)

Table CTQ 28
High School Computer Science Classes in Which Teachers Report Having Control Over Various Curricular and Instructional Decisions

	PERCENT OF CLASSES				
	NO CONTROL 1	2	MODERATE CONTROL 3	4	STRONG CONTROL 5
Determining course goals and objectives	5 (1.5)	6 (1.6)	15 (2.6)	17 (4.2)	57 (4.3)
Selecting curriculum materials (e.g., textbooks/online courses)	4 (1.3)	5 (1.4)	15 (2.4)	19 (4.1)	58 (4.7)
Selecting content, topics, and skills to be taught	4 (1.3)	8 (1.7)	13 (1.9)	21 (4.2)	53 (4.2)
Selecting programming languages to use	13 (2.2)	10 (2.2)	11 (2.5)	17 (3.9)	49 (4.3)
Selecting the sequence in which topics are covered	2 (1.0)	5 (1.8)	10 (1.7)	19 (3.3)	63 (4.2)
Determining the amount of instructional time to spend on each topic	1 (0.9)	2 (1.0)	11 (2.4)	23 (3.4)	63 (4.4)
Selecting teaching techniques	0 (0.4)	2 (1.6)	8 (1.9)	22 (4.0)	68 (4.5)
Determining the amount of homework to be assigned	0 (0.3)	2 (1.0)	6 (1.5)	15 (3.2)	77 (3.6)
Choosing criteria for grading student performance	1 (0.6)	5 (2.7)	6 (1.5)	17 (3.4)	71 (4.1)

Table CTQ 29
Emphasis Given in High School Computer Science Classes to Various Instructional Objectives

	PERCENT OF CLASSES			
	NONE	MINIMAL EMPHASIS	MODERATE EMPHASIS	HEAVY EMPHASIS
Learning computer science vocabulary and/or program syntax	0 ---†	12 (2.3)	56 (4.2)	33 (3.9)
Understanding computer science concepts	0 ---†	5 (1.8)	40 (3.4)	55 (3.6)
Learning how to do computer science (e.g., breaking problems into smaller parts, considering the needs of a user, creating computational artifacts)	0 (0.2)	3 (1.0)	37 (3.7)	60 (3.5)
Learning how to develop computational solutions	0 (0.2)	10 (2.2)	47 (4.1)	43 (4.1)
Learning about real-life applications of computer science	0 (0.1)	15 (2.5)	46 (4.0)	39 (4.3)
Increasing students' interest in computer science	0 (0.1)	8 (1.8)	43 (3.9)	50 (3.6)
Developing students' confidence that they can successfully pursue careers in computer science	0 ---†	4 (1.3)	43 (3.7)	52 (3.9)

† No high school computer science teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table CTQ 30
High School Computer Science Classes in Which Teachers Report Using Various Activities in Their Classrooms

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL COMPUTER SCIENCE LESSONS
Explain computer science ideas to the whole class	0 (0.1)	3 (1.1)	13 (2.7)	57 (4.0)	27 (3.4)
Engage the whole class in discussions	0 (0.2)	5 (1.8)	23 (3.2)	44 (3.6)	27 (3.4)
Have students work in small groups	1 (0.3)	11 (2.5)	22 (3.5)	36 (4.2)	30 (2.8)
Have students do hands-on/manipulative programming activities that do not require a computer	8 (2.2)	39 (4.2)	32 (4.0)	13 (2.9)	8 (2.3)
Have students work on programming activities using a computer	0 ---†	1 (0.5)	3 (1.3)	27 (3.7)	69 (3.7)
Use flipped instruction (have students watch lectures/demonstrations outside of class to prepare for in-class activities)	28 (3.5)	31 (4.2)	17 (2.8)	16 (2.5)	8 (2.4)
Have students read from a textbook/online course in class, either aloud or to themselves	22 (3.8)	26 (3.4)	21 (3.5)	25 (3.7)	6 (2.1)
Have students explain and justify their method for solving a problem	1 (0.6)	8 (1.8)	28 (3.4)	44 (4.5)	19 (4.2)
Have students present their solution strategies to the rest of the class	6 (1.6)	22 (3.0)	37 (3.8)	29 (3.7)	6 (2.2)
Have students compare and contrast different methods for solving a problem	4 (1.5)	22 (3.6)	33 (3.6)	33 (3.4)	8 (2.4)
Have students write their reflections (e.g., in their journals, on exit tickets) in class or for homework	22 (3.8)	28 (3.5)	18 (3.0)	19 (3.5)	13 (3.4)
Focus on literacy skills (e.g., informational reading or writing strategies)	19 (2.4)	32 (4.0)	29 (3.9)	16 (2.8)	4 (2.0)

† No high school computer science teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table CTQ 31
High School Computer Science Classes in Which Teachers Report Students Engaging in Various Aspects of Computer Science Practices

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL COMPUTER SCIENCE LESSONS
Create computational artifacts (e.g., programs, simulations, visualizations, digital animations, robotic systems, or apps)	3 (1.0)	8 (2.2)	14 (2.5)	26 (3.3)	50 (4.1)
Create a computational artifact designed to be used by someone outside the class or other students	14 (2.7)	38 (3.9)	26 (3.3)	15 (3.1)	6 (2.2)
Provide feedback on other students' computational products or designs	3 (1.6)	20 (3.5)	29 (3.5)	37 (4.5)	10 (1.9)
Get input on computational products or designs from people with different perspectives (do not include feedback that you give students)	16 (3.1)	31 (3.8)	32 (3.6)	16 (3.6)	5 (2.1)
Systematically use test cases to verify program performance and/or identify problems	11 (2.7)	23 (4.1)	21 (2.7)	33 (4.2)	13 (3.0)
Identify real-world problems that might be solved computationally	1 (0.6)	16 (2.9)	37 (4.7)	29 (3.9)	17 (3.7)
Consider how a program they are creating can be separated into modules/procedures/objects	2 (0.9)	10 (1.7)	26 (3.5)	37 (3.7)	25 (3.4)
Identify and adapt existing code to solve a new computational problem	2 (0.9)	9 (1.8)	30 (3.4)	45 (3.7)	14 (2.4)
Use computational methods to simulate events or processes (e.g., rolling dice, supply and demand)	7 (2.0)	12 (2.8)	36 (3.9)	36 (3.5)	10 (1.9)
Analyze datasets using a computer to detect patterns	25 (3.7)	24 (3.1)	32 (3.5)	15 (3.3)	5 (2.1)
Write comments within code to document purposes or features	0 (0.2)	7 (1.9)	21 (2.7)	39 (3.8)	33 (4.3)
Create instructions for an end-user explaining how to use a computational artifact	17 (3.2)	23 (3.0)	31 (3.9)	21 (3.4)	9 (2.9)
Explain computational solution strategies verbally or in writing	4 (1.1)	15 (2.4)	39 (4.0)	32 (3.9)	11 (3.3)
Compare and contrast the strengths and limitations of different representations such as flow charts, tables, code, or pictures	19 (2.8)	32 (3.7)	28 (3.0)	17 (3.3)	6 (2.2)

Table CTQ 32
Provision of Technologies in High School Computer Science Classes

	PERCENT OF CLASSES		
	COMPUTERS (DESKTOPS OR LAPTOPS)	MOBILE COMPUTING DEVICES (TABLETS OR SMARTPHONES)	DATA STORAGE DEVICES
Not required for this class	0 ---†	57 (4.2)	46 (3.3)
Provided by the school, and students are not allowed to use their own	35 (4.5)	9 (2.2)	9 (2.8)
Provided by the school, but students are allowed to use their own	58 (4.5)	15 (2.3)	26 (3.4)
Students are expected to provide their own, but the school has some available for use	2 (0.7)	10 (2.9)	7 (2.2)
Students are required to provide their own	5 (1.6)	8 (3.4)	13 (2.4)

† No high school computer science teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table CTQ 33
Availability of Instructional Technology in High School Computer Science Classes

	PERCENT OF CLASSES		
	NOT AVAILABLE	AVAILABLE UPON REQUEST	ALWAYS AVAILABLE IN YOUR CLASSROOM
Probes for collecting data (e.g., motion sensors, temperature probes)	60 (3.9)	25 (3.2)	16 (3.1)
Projection devices (e.g., Smartboard, document camera, LCD projector)	1 (0.5)	12 (2.8)	87 (2.9)
Robotics equipment	43 (3.3)	30 (3.7)	26 (3.6)

Table CTQ 34
Amount of Homework Assigned in High School Computer Science Classes Per Week

	PERCENT OF CLASSES
None	16 (2.6)
1–15 minutes per week	13 (2.9)
16–30 minutes per week	22 (4.4)
31–60 minutes per week	29 (3.9)
61–90 minutes per week	12 (2.5)
91–120 minutes per week	4 (1.0)
More than 2 hours per week	4 (1.2)

Table CTQ 35
Frequency of Use of Various Instructional Resources in High School Computer Science Classes

	PERCENT OF CLASSES				
	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL COMPUTER SCIENCE LESSONS
Commercially published textbooks (printed or electronic), including the supplementary materials (e.g., worksheets) that accompany the textbooks	36 (3.6)	21 (3.4)	17 (2.9)	17 (3.2)	9 (1.8)
State, county, or district/diocese-developed units or lessons	69 (4.4)	12 (2.3)	12 (2.9)	4 (1.2)	3 (1.9)
Online units or courses that students work through at their own pace (e.g., MOOCS, EdX, IMACS)	33 (3.2)	15 (2.9)	19 (3.3)	18 (3.3)	15 (3.3)
Lessons or resources from websites that have a subscription fee or per lesson cost (e.g., BrainPOP, Discovery Ed, Teachers Pay Teachers)	63 (4.0)	11 (2.0)	17 (3.3)	6 (1.7)	3 (1.4)
Lessons or resources from websites that are free (e.g., Khan Academy, code.org)	14 (2.8)	15 (2.5)	28 (3.6)	22 (3.9)	21 (4.0)
Units or lessons you created (either by yourself or with others)	6 (2.2)	7 (1.4)	23 (3.2)	35 (3.9)	28 (4.2)
Units or lessons you collected from any other source (e.g., conferences, journals, colleagues, university or museum partners)	14 (2.9)	17 (3.4)	41 (4.2)	22 (3.4)	6 (1.4)

Table CTQ 36
High School Computer Science Classes for Which the District/Diocese Designates Instructional Materials to Be Used

	PERCENT OF CLASSES
Instructional materials designated by district/diocese	26 (3.7)

Table CTQ 37
High School Computer Science Classes for Which Various Types of Instructional Materials Are Designated

	PERCENT OF CLASSES
Commercially published textbooks (printed or electronic), including the supplementary materials (e.g., worksheets) that accompany the textbooks	14 (3.0)
State county/district/diocese-developed instructional materials	2 (1.0)
Online units or courses that students work through at their own pace (e.g., MOOCs, EdX, IMACS)	4 (1.0)
Lessons or resources from websites that have a subscription fee or per lesson cost (e.g., BrainPOP, Discovery Ed, Teachers Pay Teachers)	9 (3.2)
Lessons or resources from websites that are free (e.g., Khan Academy, code.org)	15 (4.0)

There is no table for CTQ 38.

Table CTQ 39a
Copyright Year of Instructional Materials Used in High School Computer Science Classes

	PERCENT OF CLASSES†
2018	0 ---‡
2017	8 (5.2)
2016	9 (3.6)
2015	12 (4.6)
2014	4 (2.1)
2013	9 (5.2)
2012 or earlier	59 (7.0)

† Includes only high school computer science classes for which teachers indicated in Q37 that they use commercially published textbooks.

‡ No high school computer science teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table CTQ 39b
Publishers of Textbooks Used in High School Computer Science Classes

	PERCENT OF CLASSES†
Pearson	24 (5.6)
Cengage	23 (5.9)
Skylight	12 (4.6)
Wiley	8 (3.8)
Project Lead The Way	6 (2.5)
Jones & Bartlett Learning	5 (3.2)
D&S Marketing Systems	3 (2.9)
Goodheart-Wilcox	3 (2.0)
Stacey Armstrong	3 (2.2)
Apple Inc. Education	2 (1.6)
Emc Publishing	2 (2.1)
Microsoft Press	2 (1.6)
O'Reilly Media	2 (1.4)
Virtualbookworm.com Publishing	2 (1.4)
Barron's Educational Series	1 (1.3)
McGraw-Hill Education	1 (0.5)
Oracle	1 (0.8)
Oxford University Press	1 (1.0)
Springer Nature	1 (0.9)
STEM Fuse	0 (0.5)

† Includes only high school computer science classes for which teachers indicated in Q37 that they use commercially published textbooks.

There is no table for CTQ 40.

Table CTQ 41
High School Computer Science Classes in Which Teachers Report the Effect Various Factors Have on Computer Science Instruction

	PERCENT OF CLASSES					
	INHIBITS EFFECTIVE INSTRUCTION 1	2	NEUTRAL OR MIXED 3	4	PROMOTES EFFECTIVE INSTRUCTION 5	N/A
Current state standards	2 (1.0)	5 (1.8)	34 (3.7)	10 (2.3)	18 (3.3)	30 (4.5)
Textbook selection policies	4 (1.3)	4 (1.0)	37 (4.2)	5 (1.2)	12 (2.9)	39 (4.7)
Teacher evaluation policies	3 (1.0)	5 (1.5)	40 (4.4)	17 (3.6)	21 (3.8)	14 (2.4)
College entrance requirements	1 (0.5)	3 (0.9)	40 (4.5)	16 (2.9)	22 (3.4)	18 (3.0)
Students' prior knowledge and skills	5 (1.4)	10 (2.7)	24 (3.4)	31 (3.4)	25 (2.9)	6 (2.7)
Students' motivation, interest, and effort in computer science	2 (1.0)	8 (2.3)	14 (3.2)	25 (3.3)	50 (3.7)	1 (0.4)
Parent/guardian expectations and involvement	1 (0.6)	7 (1.9)	43 (3.6)	20 (3.6)	19 (3.5)	10 (2.8)
Principal support	1 (0.6)	1 (0.8)	17 (2.6)	25 (3.8)	48 (4.3)	7 (2.4)
Amount of time for you to plan, individually and with colleagues	6 (1.7)	4 (1.2)	17 (3.3)	23 (3.4)	43 (3.5)	6 (1.4)
Amount of time available for your professional development	4 (1.1)	8 (1.8)	21 (3.4)	24 (3.9)	40 (3.8)	4 (1.0)

Table CTQ 42
High School Computer Science Classes in Which Teachers Report Technology Problems

	PERCENT OF CLASSES		
	NOT A SIGNIFICANT PROBLEM	SOMEWHAT OF A PROBLEM	SERIOUS PROBLEM
Lack of reliable access to the Internet	81 (4.4)	15 (4.2)	5 (1.6)
Lack of functioning computing devices (e.g., desktop computers, laptop computers, tablets, smartphones)	73 (4.5)	19 (4.2)	8 (2.2)
Insufficient power sources for devices (e.g., electrical outlets, charging stations)	86 (3.1)	10 (2.8)	4 (1.2)
Lack of support to maintain technology (e.g., repair broken devices, install software)	66 (4.4)	25 (3.4)	9 (2.7)
School restrictions on Internet content that is allowed	63 (4.3)	29 (3.3)	9 (2.4)

Table CTQ 43
Focus of the Most Recently Completed High School Computer Science Unit

	PERCENT OF CLASSES
Computing systems	7 (1.8)
Networks and the Internet	5 (1.8)
Data and analysis	1 (0.3)
Algorithms and programming	81 (3.0)
Impacts of computing	6 (1.9)

Table CTQ 44
Most Recent High School Computer Science Unit Based Primarily on Any Commercially Published Textbook or State/County/District-Developed Materials

	PERCENT OF CLASSES†
Most recent unit based on commercially published textbook or state/county/district-developed materials	63 (5.4)

† Includes only high school computer science classes for which teachers indicated in Q35 that they use commercially published textbooks or state/county/district/diocese-developed units or lessons more than once a month.

Table CTQ 45
Ways Instructional Materials Were Used in the Most Recently Completed Unit in High School Computer Science Classes

	PERCENT OF CLASSES†				
	NOT AT ALL 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 5
I used these materials to guide the structure and content emphasis of the unit.	0 (0.2)	0 ---‡	16 (3.6)	38 (6.6)	46 (7.1)
I picked what is important from these materials and skipped the rest.	5 (2.1)	15 (4.2)	31 (6.3)	27 (6.0)	22 (6.5)
I incorporated activities (e.g., problems, investigations, readings) from other sources to supplement what these materials were lacking.	1 (0.9)	6 (3.8)	22 (5.2)	48 (6.5)	22 (6.5)
I modified activities from these materials.	6 (3.1)	10 (3.6)	28 (5.4)	35 (6.4)	21 (5.9)

† Includes only high school computer science classes for which teachers responded yes in Q44.

‡ No high school computer science teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table CTQ 46
Reasons Parts of the Instructional Materials Were Skipped in High School Computer Science Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
The computer science ideas addressed in the activities I skipped are not included in my pacing guide/standards.	51 (6.7)	39 (6.8)	11 (4.0)
I did not have the materials needed to implement the activities I skipped.	72 (7.0)	19 (6.1)	8 (4.0)
I did not have the knowledge needed to implement the activities I skipped.	65 (7.5)	30 (7.3)	6 (2.6)
The activities I skipped were too difficult for my students.	49 (7.2)	44 (6.8)	8 (2.9)
My students already knew the computer science ideas or were able to learn them without the activities I skipped.	56 (6.2)	36 (6.1)	8 (3.0)
I have different activities for those computer science ideas that work better than the ones I skipped.	32 (5.6)	48 (6.6)	20 (4.9)
I did not have enough instructional time for the activities I skipped.	40 (5.8)	44 (7.0)	16 (4.2)

† Includes only high school computer science classes for which teachers responded yes in Q44 and indicated in Q45 that they "picked what was important from these materials and skipped the rest" to any extent.

Table CTQ 47
Reasons Why the Instructional Materials Were Supplemented in High School Computer Science Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
My pacing guide indicated that I should use supplemental activities.	66 (6.3)	30 (6.3)	4 (1.8)
Supplemental activities were needed to prepare students for standardized tests.	48 (6.9)	39 (7.5)	13 (3.4)
Supplemental activities were needed to provide students with additional practice.	21 (5.0)	43 (6.8)	36 (6.0)
Supplemental activities were needed so students at different levels of achievement could increase their understanding of the ideas targeted in each activity.	27 (5.6)	42 (6.5)	31 (5.7)
I had additional activities that I liked.	21 (5.7)	49 (7.5)	29 (6.1)

† Includes only high school computer science classes for which teachers responded yes in Q44 and indicated in Q45 that they "incorporated activities (e.g., problems, investigations, readings) from other sources to supplement what these materials were lacking" to any extent.

Table CTQ 48
Reasons Why the Instructional Materials Were Modified in High School Computer Science Classes

	PERCENT OF CLASSES†		
	NOT A FACTOR	A MINOR FACTOR	A MAJOR FACTOR
I did not have the necessary materials/supplies for the original activities.	68 (7.1)	29 (7.2)	3 (1.5)
The original activities were too difficult conceptually for my students.	57 (6.5)	35 (6.6)	8 (2.7)
The original activities were too easy conceptually for my students.	67 (6.3)	32 (6.3)	1 (0.8)
I did not have enough instructional time to implement the activities as designed.	46 (6.5)	47 (6.7)	7 (2.6)
The original activities were too structured for my students.	69 (6.6)	29 (6.6)	2 (1.3)
The original activities were not structured enough for my students.	63 (7.3)	35 (7.3)	2 (1.5)

† Includes only high school computer science classes for which teachers responded yes in Q44 and indicated in Q45 that they "modified activities from these materials" to any extent.

Table CTQ 49
High School Computer Science Classes Taught by Teachers Feeling Prepared for Each of a Number of Tasks in the Most Recent Unit

	PERCENT OF CLASSES			
	NOT ADEQUATELY PREPARED	SOMEWHAT PREPARED	FAIRLY WELL PREPARED	VERY WELL PREPARED
Anticipate difficulties that students may have with particular computer science ideas and procedures in this unit	3 (0.9)	18 (3.2)	53 (4.5)	26 (3.9)
Find out what students thought or already knew about the key computer science ideas	1 (0.8)	20 (3.2)	50 (3.8)	29 (4.6)
Implement the instructional materials (e.g., textbook, online course) to be used during this unit	2 (0.7)	15 (2.8)	42 (4.2)	41 (4.2)
Monitor student understanding during this unit	1 (0.5)	14 (3.1)	42 (4.2)	43 (4.6)
Assess student understanding at the conclusion of this unit	2 (0.8)	12 (2.8)	45 (3.9)	41 (4.0)

Table CTQ 50
Duration of the Most Recent High School Computer Science Lesson

	AVERAGE NUMBER OF MINUTES
Duration of lesson	61 (1.9)

Table CTQ 51
Average Percentage of Time Spent on Different Activities in the Most Recent High School Computer Science Lesson

	AVERAGE PERCENT OF CLASS TIME
Non-instructional activities (e.g., attendance taking, interruptions)	9 (0.5)
Whole class activities (e.g., lectures, explanations, discussions)	29 (2.3)
Small group work	22 (2.1)
Students working individually (e.g., reading textbooks, programming, taking a test or quiz)	40 (2.1)

Table CTQ 52
High School Computer Science Classes Participating in Various Activities in the Most Recent Lesson

	PERCENT OF CLASSES
Teacher explaining a computer science idea to the whole class	70 (3.7)
Teacher conducting a demonstration while students watched	46 (3.6)
Whole class discussion	49 (4.1)
Students working in small groups	57 (4.2)
Students completing textbook/worksheet problems	16 (3.0)
Students doing hands-on/manipulative programming activities not using a computer	19 (2.9)
Students working on programming tasks using a computer	84 (2.8)
Students reading about computer science	20 (2.8)
Students writing about computer science (do not include students taking notes)	13 (3.0)
Test or quiz	9 (1.6)
None of the above	0 ---†

† No high school computer science teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table CTQ 53
Sex of High School Computer Science Teachers

	PERCENT OF TEACHERS
Female	40 (3.6)
Male	60 (3.6)
Other	0 ---†

† No high school computer science teachers in the sample selected this response option. Thus, it is not possible to calculate the standard error of this estimate.

Table CTQ 54
High School Computer Science Teachers of Hispanic or Latino Origin

	PERCENT OF TEACHERS
Hispanic or Latino	8 (2.2)

Table CTQ 55
Race of High School Computer Science Teachers

	PERCENT OF TEACHERS
American Indian or Alaskan Native	2 (0.5)
Asian	4 (1.4)
Black or African American	3 (1.3)
Native Hawaiian or Other Pacific Islander	1 (0.6)
White	94 (1.7)

Table CTQ 56
Age of High School Computer Science Teachers

	AVERAGE TEACHER AGE
Age	44 (1.0)