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
9th–12th 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 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 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 1	2	SOMEWHAT 3	4	TO A GREAT EXTENT 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)