



	Percentage of Students Whose Teachers Report Feeling Very Well Prepared to Teach Topic ¹							
	Earth science – earth's features and physical processes	Earth science – the solar system and the universe	Biology – structure and function of human systems	Biology – diversity, structure, and processes of plant and animal life	Chemistry – classification and structure of matter	Chemistry – chemical reactivity and transformation		
Countries								
United States Belgium (Flemish) Canada Chinese Taipei Czech Republic	r 61 (3.0) r 64 (4.5) r 41 (3.4) 17 (3.9) 70 (3.4)	r 56 (3.4) r 30 (4.9) r 30 (3.6) 16 (3.6) 68 (3.6)	r 65 (2.5) r 79 (2.9) r 59 (3.4) 10 (3.6) 77 (3.1)	r 62 (3.0) 65 (3.9) r 60 (3.0) 12 (4.0) 74 (3.8)	r 58 (3.4) s 58 (5.7) s 48 (3.7) 64 (4.3) 69 (3.7)	r 42 (4.1) s 37 (5.9) s 36 (3.9) 66 (4.4) 68 (3.5)		
England Hong Kong, SAR Italy Japan Korea, Rep. of Netherlands Russian Federation	 8 (2.7) 29 (3.6) 12 (2.8) 26 (3.7) r 54 (4.1) 	 9 (2.6) 33 (3.8) 11 (2.8) 22 (3.3) r 43 (4.5) 	 44 (4.2) 67 (3.6) 19 (3.5) 42 (3.6) r 59 (3.8) 	 38 (4.5) 63 (3.7) 16 (3.1) 34 (3.7) r 56 (3.9) 	 35 (4.8) 49 (3.6) 25 (3.5) 40 (4.0) r 41 (4.2) 	 36 (4.1) 36 (4.0) 31 (3.6) 45 (3.6) r 35 (3.9) 		
Singapore	13 (3.3)	11 (3.2)	56 (4.6)	52 (4.6)	63 (3.5)	57 (4.1)		
States Connecticut Idaho Illinois Indiana Maryland Massachusetts Michigan Missouri North Carolina Oregon Pennsylvania South Carolina Texas	s 70 (7.1) r 51 (5.8) 53 (6.2) 61 (6.3) r 64 (6.4) r 58 (7.3) 71 (5.8) 60 (5.0) 83 (4.6) 54 (5.3) 72 (6.3) r 65 (4.8)	s 48 (9.7) r 49 (8.0) 44 (6.9) 61 (8.9) r 55 (5.8) 54 (5.9) r 45 (6.8) 64 (6.9) 47 (5.5) 70 (5.2) 49 (5.3) 76 (5.5) r 72 (5.2)	s 64 (7.5) r 59 (7.4) 73 (5.9) 73 (6.1) r 67 (5.1) 68 (6.4) r 72 (6.7) 76 (4.8) r 55 (6.2) 66 (7.1) 52 (8.8) 65 (6.0) r 70 (6.6)	s 55 (7.4) r 57 (7.3) 71 (6.1) 65 (7.4) r 67 (5.5) r 65 (6.5) r 68 (6.1) 66 (6.3) 51 (5.6) 71 (7.0) 52 (5.0) 61 (6.9) r 64 (6.6)	s 75 (6.1) r 51 (4.1) 58 (5.4) 70 (6.9) r 67 (5.8) r 69 (5.8) r 63 (6.8) 50 (5.5) 55 (5.9) 52 (6.3) r 52 (6.2) 49 (6.6) r 48 (7.0)	s 55 (9.1) r 35 (6.7) 51 (5.3) 54 (7.6) r 48 (5.9) 47 (6.6) r 44 (8.8) 27 (5.6) 43 (5.6) 38 (7.2) 38 (6.6) 31 (6.4) r 35 (6.7)		
Academy School Dist. #20. CO	56 (0.5)	66 (0.5)	80 (0.3)	80 (03)	68 (0.4)	60 (0.4)		
Chicago Public Schools, IL Delaware Science Coalition, DE First in the World Consort., IL Fremont/LincolwestSide PS, NE	r 63 (5.0) 45 (7.5) 50(10.3)	50 (12.8) r 60 (4.9) 27 (5.1) 63 (8.3)	60 (9.8) r 53 (4.6) 94 (4.3) 77 (3.1)	r 58 (9.8) r 47 (6.8) 85 (7.2) 83 (4.0)	49 (9.4) r 57 (5.7) 81 (3.3) 55 (3.6)	41 (9.3) r 33 (7.1) 62 (8.0) 47 (4.6)		
Guilford County, NC Jersey City Public Schools, NJ Miami-Dade County PS, FL Michigan Invitational Group, MI Montgomery County, MD Naperville Sch. Dist. #203, IL	61 (7.2) r 58 (2.9) s 54(10.3) 77 (5.1) x x 41 (2.5)	41 (5.2) r 49 (3.0) s 46 (8.9) 61 (6.2) x x 24 (3.0)	50 (5.3) r 61 (3.1) s 68 (8.8) 57 (7.7) x x 67 (3.9)	55 (5.8) r 64 (2.9) s 57 (8.3) 62 (7.0) x x 65 (2.8)	61 (5.7) r 43 (2.8) s 62 (7.4) 65 (2.9) x x 82 (1.7)	47 (7.1) r 17 (3.4) s 50 (8.5) 58 (3.6) x x 48 (4.8)		
Project SMART Consortium, OH Rochester City Sch. Dist., NY SW Math/Sci. Collaborative, PA	79 (3.7) r 25 (7.5) 73 (6.6)	64 (4.5) r 23 (5.7) 61 (8.9)	60 (4.1) 85 (4.4) 51 (6.7)	60 (2.7) 78 (4.8) 56 (6.0)	73 (4.5) 59 (5.7) 63 (8.3)	52 (4.7) 26 (5.7) 46 (7.4)		
International Avg. (All Countries)	36 (0.6)	32 (0.6)	60 (0.6)	55 (0.6)	51 (0.7)	46 (0.7)		

Background data provided by teachers.

1 $\,$ Does not include students whose teachers report that they do not teach the topic.

2 Percentage of students averaged across topics.

States in *italics* did not fully satisfy guidelines for sample participation rates (see Appendix A for details).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A dash (--) indicates data are not available.



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8th Grade Science

		Report Feeling Very Well Prepared to Teach Topic ¹								
	Physics – types of energy, sources of energy, conversion between energy types	Physics – light	Environmental and resources issues	Scientific methods and inquiry skills	Average ²					
Countries										
United States Belgium (Flemish) Canada Chinese Taipei Czech Republic	r 55 (4.2) r 33 (4.1) r 48 (3.8) 70 (3.8) 64 (3.2)	r 40 (3.6) r 63 (5.6) s 34 (3.4) 58 (4.1) r 60 (3.7)	r 56 (3.8) 28 (2.6) r 45 (3.7) 20 (3.6) 66 (2.8)	86 (2.2) 30 (3.2) 58 (3.0) 21 (3.6) 12 (2.0)	58 (1.5) 47 (2.1) 44 (1.7) 42 (2.6) 64 (2.0)					
England Hong Kong, SAR Italy Japan Korea, Rep. of Netherlands	 47 (4.7) 40 (3.5) 17 (2.9) 35 (3.6) r 54 (3.0)	 33 (4.5) 31 (3.5) 11 (3.0) 17 (3.1) r 57 (3.5)	 30 (4.1) 48 (4.3) 17 (3.4) 22 (3.3) 49 (3.6)	 36 (4.3) 32 (3.8) 11 (3.0) 21 (3.0) 41 (4.5)	 34 (2.4) 42 (2.1) 17 (1.7) 31 (1.9) 50 (1.7)					
Russian Federation	 E8 (4 0)	 E7 (2.0)		 2E (4 E)	 46 (2.4)					
States	58 (4.0)	57 (5.5)	50 (4.0)	55 (4.5)	40 (2.4)					
Connecticut Idaho Illinois Indiana Maryland	s 63 (7.6) r 60 (7.3) 46 (7.0) 58 (8.0) r 53 (5.2)	s 50 (7.0) r 41 (8.7) 39 (7.3) 52 (7.8) r 51 (5.9)	s 60 (8.2) r 44 (5.5) 58 (6.5) 50 (6.5) r 60 (7.1)	89 (4.0) 66 (4.6) 84 (2.6) 90 (3.3) 87 (3.4)	64 (3.6) 53 (3.8) 58 (2.6) 65 (3.0) 62 (3.4)					
Massachusetts Michigan Missouri North Carolina Oregon	55 (6.8) 62 (6.1) 41 (5.9) 47 (7.9) 51 (6.5)	43 (5.8) 50 (5.5) 33 (6.1) 38 (6.0) 35 (6.5)	60 (4.7) 47 (6.3) 60 (7.3) 67 (6.5) 65 (7.0)	91 (2.5) 74 (5.7) 81 (5.6) 76 (5.6) 85 (4.5)	61 (2.1) 58 (3.0) 57 (2.6) 53 (4.0) 62 (3.3)					
Pennsylvania South Carolina Texas Districts and Consortia	37 (5.2) 36 (6.6) r 47 (7.8)	32 (5.2) 36 (7.2) r 24 (4.8)	53 (5.8) 61 (6.0) r 60 (5.5)	79 (6.8) 86 (4.9) 88 (4.8)	52 (3.4) 57 (3.3) 60 (3.5)					
Academy School Dist. #20, CO Chicago Public Schools, IL Delaware Science Coalition, DE First in the World Consort., IL Fremont/Lincoln/WestSide PS, NE	82 (0.4) 48 (12.8) r 28 (5.2) 58 (8.8) 51 (6.4)	r 26 (5.1) 50 (6.7) 40 (9.3)	63 (0.5) 33 (10.8) r 50 (8.6) 72 (5.7) 41 (6.3)	75 (0.3) 74 (11.6) 69 (5.5) 83 (7.5) 88 (2.6)	69 (0.1) 49 (6.3) 49 (2.9) 69 (3.7) 59 (2.5)					
Guilford County, NC Jersey City Public Schools, NJ Miami-Dade County PS, FL Michigan Invitational Group, MI Montgomery County, MD	51 (5.8) r 39 (2.8) s 63 (8.4) 58 (4.1) x x	31 (4.4) r 32 (2.9) s 52 (7.8) 31 (3.9) x x	67 (4.9) r 51 (2.6) s 69 (8.7) 47 (6.5) x x	75 (5.1) 68 (2.5) 82 (5.8) 83 (4.8) x x	54 (3.3) 46 (2.6) 60 (4.4) 62 (3.4) x x					
Naperville Sch. Dist. #203, IL Project SMART Consortium, OH Rochester City Sch. Dist., NY SW Math/Sci. Collaborative, PA	93 (1.6) 72 (3.7) 62 (4.9) 54 (7.5)	63 (4.2) 60 (5.7) 32 (6.1) 25 (7.2)	46 (3.7) 50 (5.6) 56 (5.9) 52 (5.9)	98 (0.3) 84 (4.2) 78 (3.9) 84 (5.6)	64 (1.6) 4 67 (2.1) 57 (4.1) 56 (3.4) 56					
International Avg. (All Countries)	50 (0.6)	45 (0.6)	39 (0.6)	34 (0.6)	46 (0.4)					





Exhibit R3.2

Percentage of Students Whose Schools Report That Shortages



Chemistry

6 (2.6)

22 (6.6)

40 (4.0)

27 (1.0)

r

8th Grade Science

Physics

4 (1.6)

9 (2.7)

24 (6.5)

39 (3.7)

28 (0.9)

r

Biology

7 (3.3)

9 (3.1)

12 (5.8)

40 (3.6)

26 (0.9)

Affect Instructional Capacity Some or A Lot **Countries with Separate Science Subjects** Participants with General/ **Integrated Science** Earth Science Countries Belgium (Flemish) 4 (1.5) Czech Republic United States 12 (3.8) 16 (2.5) Canada 19 (2.1) Netherlands 5 (1.6) r Chinese Taipei a 21 (3.4) **Russian Federation** 42 (3.5) England 5 (2.1) r International Avg. Hong Kong, SAR 13 (2.7) 25 (0.9) (All Separate Italy 26 (3.6) Science Countries) Japan 17 (3.3) Korea, Rep. of 32 (3.9) Singapore 17 (3.2) States Connecticut 10 (5.0) s Idaho 4 (2.3) r Illinois 9 (3.8) Indiana 10 (6.7) Maryland r 23 (5.8) Massachusetts 5 (4.1) S Michigan 10 (4.6) 15 (5.8) Missouri 1999 North Carolina 24 (6.8) 1998-1 Oregon 8 (4.2) Pennsylvania 5 (2.9) IEA Third International Mathematics and Science Study (TIMSS), South Carolina 22 (6.7) Texas 27 (9.3) r **Districts and Consortia** Academy School Dist. #20, CO 0 (0.0) Chicago Public Schools, IL 26 (10.2) S Delaware Science Coalition, DE r 20 (2.3) First in the World Consort., IL 0 (0.0) r Fremont/Lincoln/WestSide PS, NE r 0 (0.0) Guilford County, NC r 32 (1.0) Jersey City Public Schools, NJ 29 (1.8) Miami-Dade County PS, FL хх Michigan Invitational Group, MI 40 (1.6) Montgomery County, MD S 19 (10.8) Naperville Sch. Dist. #203, IL 0 (0.0) Project SMART Consortium, OH 19 (0.8) SOURCE: Rochester City Sch. Dist., NY 19 (1.3) r SW Math/Sci. Collaborative, PA 4 (3.1)

International Avg. (All General Science Countries)

35 (0.7)

Background data provided by schools.

Countries are classified as having either general/integrated science or separate subject area classes at grade 8.

a Chinese Taipei: Data pertain to teachers of grade 8 physics/chemistry course.

States in italics did not fully satisfy guidelines for sample participation rates (see Appendix A for details).

A dash (--) indicates data are not available

An "r" indicates school response data available for 70-84% of students. An "s" indicates school response data available for 50-60% of students. An "x" indicates school response data available for <50% of students.

⁽⁾ Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.



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8th Grade Science

		Science is Primarily a Formal Way of Representing the Real World			Science is Primarily a Practical and Structured Guide for Addressing Real Situations
Jersey City Public Schools, NJ	r	•••••••	Academy School Dist. #20, CO		
Chinese Taipei		o	Chinese Taipei		
Hong Kong, SAR		······o	Jersey City Public Schools, NJ	r	
Fremont/Lincoln/WestSide PS, NE		·····••	Naperville Sch. Dist. #203, IL		
Miami-Dade County PS, FL	s	o	Miami-Dade County PS, FL	s	
Indiana		o	Hong Kong, SAR		
Project SMART Consortium, OH		o	First in the World Consort., IL		······
SW Math/Sci. Collaborative, PA		o	Idaho	r	······
Missouri		·····o	Michigan Invitational Group, MI	r	······o
Michigan	r	o	SW Math/Sci. Collaborative, PA		o
South Carolina		••••••	Massachusetts		••••••••••••••••••••••••••••••••••••••
United States	r	o	Michigan	r	·····o
Maryland	r	o	South Carolina		·····o
Oregon		o	Maryland	r	·····o
Guilford County, NC		o	Singapore		·····o
North Carolina		o	Indiana		•••••••
Texas	r	······o	United States	r	·····o
Connecticut	s	o	Rochester City Sch. Dist., NY		·····o
Idaho	r	o	Oregon		······o
Illinois		••••••••••••••••••••••••••••••••••••••	Missouri		·····o
Singapore		••••••••••••••••••••••••••••••••••••••	Russian Federation		·····o
Academy School Dist. #20, CO		••••••••	North Carolina		·····o
First in the World Consort., IL		o	Illinois		o
England	S	o	Korea, Rep. of		o
Naperville Sch. Dist. #203, IL		••••••	Delaware Science Coalition, DE	r	o
Rochester City Sch. Dist., NY		o	Japan		••••••
Chicago Public Schools, IL	r	·····o	Canada	r	o
Michigan Invitational Group, MI		·····o	Texas	r	o
Massachusetts		o	Project SMART Consortium, OH		·····o
Pennsylvania		••••••••••••••••••••••••••••••••••••••	Connecticut	s	·····o
Canada	r	•••••••	England	S	o
Delaware Science Coalition, DE	r	o	Guilford County, NC		o
Belgium (Flemish)		o	Pennsylvania		o
Korea, Rep. of		o	Chicago Public Schools, IL	r	••••••••••••••••••••••••••••••••••••••
Japan		·····o	Italy		·····o
Italy		o	Czech Republic		·····o
Netherlands		o	Fremont/Lincoln/WestSide PS, NE		·····o
Czech Republic		······o	Belgium (Flemish)		·····o
Russian Federation		······o	Netherlands		·····o
Montgomery County, MD	х		Montgomery County, MD	х	

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by teachers.

States in *italics* did not fully satisfy guidelines for sample participation rates (see Appendix A for details).

0

20

40

60

80

100

An "r" indicates teacher response data available for 70-84% of students. An "s" indicates teacher response data available for 50-69% of students. An "x" indicates teacher response data available for <50% of students.

0

20

40

60

80

100



		Some Students Have a Natural Talent for Science and Others Do Not			It is Important for Teachers to Give Students Prescriptive and Sequential Directions for Doing Science Experiments
Chinese Taipei		o	Belgium (Flemish)		o
Russian Federation		o	Hong Kong, SAR		·····o
Korea, Rep. of		·····o	Jersey City Public Schools, NJ	r	o
Czech Republic		·····o	Italy		o
Belgium (Flemish)		·····••	Netherlands		·····o
Hong Kong, SAR		·····o	Singapore		·····o
England	S	•••••••	Chinese Taipei		·····o
Academy School Dist. #20, CO		••••••	North Carolina		······o
Singapore		·····o	Pennsylvania		······o
First in the World Consort., IL		······o	Canada	r	······o
Delaware Science Coalition, DE	r	·····o	Miami-Dade County PS, FL	S	·····o
South Carolina		o	Delaware Science Coalition, DE	r	·····••
North Carolina		o	Project SMART Consortium, OH		o
Illinois		o	Missouri	r	••••••
Miami-Dade County PS, FL	S	••••••	Czech Republic		••••••
Indiana		••••••	Maryland	r	·····o
Project SMART Consortium, OH		••••••	Oregon		·····o
Netherlands		••••••	Russian Federation		••••••
Guilford County, NC		••••••	United States	r	••••••
Missouri		••••••	South Carolina		••••••••••••••••••••••••••••••••••••••
Connecticut	S		Idano	r	•
Pennsylvania			Nichigan Invitational Group MI		• • • • • • • • • • • • • • • • • • •
lexas	r				0
Rochester City Sch Dist NV			SW Math/Sci Collaborative PA		
Fremont/Lincoln/WestSide PS_NF		ő	Sw Math/Sci. Conaborative, TA	c	0
Canada	r	 0	Michigan	r	o
Jersey City Public Schools NI	r	o	Guilford County NC	'	•
Oregon			Texas	r	······
Massachusetts			Academy School Dist, #20. CO		······
Chicago Public Schools, IL	r	o	Indiana		o
Japan		·····o	Fremont/Lincoln/WestSide PS, NE		·····••
SW Math/Sci. Collaborative, PA		······o	First in the World Consort., IL		······o
Idaho	r	······o	Illinois		o
Michigan	r	······o	Massachusetts		·····••
Michigan Invitational Group, MI		o	Chicago Public Schools, IL		······o
Naperville Sch. Dist. #203, IL		o	England	S	o
Maryland	r	o	Naperville Sch. Dist. #203, IL		·····o
Italy		o	Korea, Rep. of		······o
Montgomery County, MD	х		Montgomery County, MD	х	
		0 20 40 60 80 100			0 20 40 60 80 100

Exhibit R3.3

(Continued)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

8th Grade Science

		Think in a Sequential and Procedural Manner			Be Able to Think Creatively
Jersey City Public Schools, NJ	r	·····o	Jersey City Public Schools, NJ	r	·····o
Japan		·····o	First in the World Consort., IL		·····o
Delaware Science Coalition, DE	r	o	Chinese Taipei		·····o
Massachusetts		o	Academy School Dist. #20, CO		o
Miami-Dade County PS, FL	S	o	North Carolina		o
Singapore		o	Delaware Science Coalition, DE	r	o
Russian Federation		o	Idaho	r	o
Naperville Sch. Dist. #203, IL		o	Texas	r	••••••
Academy School Dist. #20, CO		o	Korea, Rep. of		o
Netherlands		o	SW Math/Sci. Collaborative, PA		o
Maryland	r	·····o	Connecticut	S	o
Guilford County, NC		o	Czech Republic		o
Pennsylvania		·····o	Japan		·····o
Connecticut	S	·····••	Guilford County, NC		·····o
Fremont/Lincoln/WestSide PS, NE		·····o	Massachusetts		o
Hong Kong, SAR		·····•o	South Carolina		·····••
United States	r	·····•o	Miami-Dade County PS, FL	S	·····••
North Carolina		·····o	Missouri		o
South Carolina		·····o	Hong Kong, SAR		o
SW Math/Sci. Collaborative, PA		·····o	United States	r	o
Belgium (Flemish)		·····o	Maryland	r	o
Texas	r	·····o	Naperville Sch. Dist. #203, IL		·····o
Czech Republic		·····o	Canada	r	·····••
Idaho	r	·····o	Russian Federation		·····••
Oregon		·····••	Oregon		o
Indiana		·····o	Michigan Invitational Group, MI		o
First in the World Consort., IL		·····••	Chicago Public Schools, IL		o
Michigan	r	·····o	Rochester City Sch. Dist., NY		·····o
England	S	·····o	Project SMART Consortium, OH		·····o
Missouri		······o	Illinois		·····o
Chinese Taipei		·····o	Michigan	r	······o
Rochester City Sch. Dist., NY		·····o	Indiana		·····••
Canada	r	·····o	Pennsylvania		······o
Project SMART Consortium, OH		······o	Singapore		·····o
Illinois		·····o	Fremont/Lincoln/WestSide PS, NE		·····o
			Leaf .		
Italy		•••••••	Italy		0
Italy Michigan Invitational Group, MI		••••••	Netherlands		······o
Italy Michigan Invitational Group, MI Chicago Public Schools, IL		······································	italy Netherlands England	s	······································
Italy Michigan Invitational Group, MI Chicago Public Schools, IL Korea, Rep. of		······································	rtaiy Netherlands England Belgium (Flemish)	s	······································
Italy Michigan Invitational Group, MI Chicago Public Schools, IL Korea, Rep. of Montgomery County, MD	х	······································	rtaiy Netherlands England Belgium (Flemish) Montgomery County, MD	s x	······································

Exhibit R3.4

Background data provided by teachers.

States in *italics* did not fully satisfy guidelines for sample participation rates (see Appendix A for details).



····0 ·····o - 0 - 0 0 0 ·····o •••••• •••0 ·····o ·····o - 0o ·····o ·····o ····· 0 0 -0 ·····oo

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

100

8th Grade Science

	Understand How Science Is Used in the Real World		Be Able to Provide Reasons to Support Their Conclusions
Academy School Dist. #20. CO		Academy School Dist. #20, CO	
Michigan Invitational Group, MI		Fremont/Lincoln/WestSide PS, NE	
Texas	r0	Michigan Invitational Group, MI	
Chicago Public Schools, II		Naperville Sch. Dist. #203, IL	
Naperville Sch. Dist. #203, IL		Jersey City Public Schools, NJ	
North Carolina	·····o	Texas	
South Carolina	·····o	Maryland	o
First in the World Consort., IL		Illinois	o
Pennsylvania	·····o	Rochester City Sch. Dist., NY	o
Jersey City Public Schools, NJ	r	SW Math/Sci. Collaborative, PA	·····o
Guilford County, NC	·····o	Connecticut	••••••
Maryland	ro	Chicago Public Schools, IL	• • • • • • • • • • • • • • • • • • •
Michigan	ro	Massachusetts	·····o
United States	ro	Guilford County, NC	·····o
Canada	ro	Miami-Dade County PS, FL	·····o
Massachusetts	o	Russian Federation	••••••
Project SMART Consortium, OH	o	North Carolina	o
Illinois	·····o	First in the World Consort., IL	·····o
SW Math/Sci. Collaborative, PA	o	Project SMART Consortium, OH	·····o
Indiana	·····o	United States	·····••
Connecticut	so	Indiana	••••••
Rochester City Sch. Dist., NY	·····o	Michigan	·····o
Chinese Taipei	·····o	Delaware Science Coalition, DE	·····o
Delaware Science Coalition, DE	ro	South Carolina	·····o
Miami-Dade County PS, FL	so	Pennsylvania	o
remont/Lincoln/WestSide PS, NE	0	Canada	o
Missouri	·····o	Singapore	••••••
Russian Federation	o	Missouri	······••
Idaho	ro	Oregon	·····••
Oregon	O	Idaho	·····•
Italy	·····o	England	0
Hong Kong, SAR	·····o	Italy	·····o
Singapore	·····o	Hong Kong, SAR	·····o
Japan	o	Netherlands	·····o
Korea, Rep. of	·····o	Japan	·····o
Netherlands	·····o	Chinese Taipei	••••••
Czech Republic	······o	Czech Republic	••••••
England	so	Belgium (Flemish)	·····0
Belgium (Flemish)	·····•o	Korea, Rep. of	•••••••
Montgomery County, MD	x	Montgomery County, MD	x



	Percentage	Percentage of Formally Scheduled School Time Averaged Across Students								
	Teaching Science, Mathematics, and Other Subjects	Teaching Science ¹	Curriculum Planning²	Administrative Duties	Other Activities ³					
Countries										
United States Belgium (Flemish) Canada Chinese Taipei Carch Rospublic	r 74 (1.0) 86 (1.1) 79 (1.0) 59 (2.3)	r 62 (1.7) 64 (2.2) 41 (1.6) 58 (2.4) 41 (1.2)	r 13 (0.7) 3 (0.4) 8 (0.5) 10 (1.0) 12 (11)	r 2 (0.3) 1 (0.3) 1 (0.3) 5 (1.0) 2 (0.2)	r 12 (0.9) 10 (0.7) 12 (0.7) 26 (1.7)					
England Hong Kong, SAR Italy Japan Korea, Rep. of	s 89 (1.0) x x 87 (1.1) 65 (1.9) 48 (1.3)	s 84 (1.1) x x 31 (0.7) 58 (2.0) 47 (1.3)	s 1 (0.4) x x 7 (0.8) 9 (1.0) 15 (0.6)	s 3 (0.6) x x 0 (0.1) 4 (0.4) 13 (0.6)	s 8 (0.8) x x 6 (0.6) 22 (1.3) 24 (1.0)					
Netherlands ⁴ Russian Federation ⁵ Singapore	r 87 (0.7) 75 (0.9)	r 75 (2.1) 65 (1.2)		 3 (0.4)	r 13 (0.7) 22 (0.8)					
States		c 61 (2.0)	c 15 (2.4)	2 (0 0)	c 1/ /1 7\					
Idaho Illinois	r 77 (1.9) 72 (2.0)	s 67 (2.8) 57 (2.1)	r 15 (2.4) r 15 (1.6) 13 (1.2)	r 2 (0.9) 2 (1.3)	r 8 (1.3) 13 (1.8)					
Maryland	r 70 (2.0)	s 66 (2.2)	r 19 (1.2)	r 2 (0.5)	r 9 (1.2)					
Massachusetts Michigan Missouri North Carolina Oregon	73 (1.3) r 73 (2.5) 74 (2.2) 63 (2.4) 78 (1.9)	r 66 (2.0) r 54 (2.4) r 65 (2.5) r 50 (3.2) r 63 (2.6)	15 (1.5) r 16 (2.1) 13 (1.6) 20 (1.6) 13 (1.3)	2 (0.5) r 2 (0.7) 1 (0.5) 2 (0.6) 1 (0.4)	10 (1.1) r 9 (1.4) 12 (1.4) 15 (1.9) 8 (1.1)					
Pennsylvania South Carolina Texas Districts and Consortia	73 (1.8) 64 (2.3) r 70 (2.5)	r 63 (5.2) r 55 (3.0) r 63 (3.1)	8 (0.9) 20 (1.6) r 15 (1.7)	2 (0.5) 1 (0.3) r 2 (0.6)	17 (1.7) 15 (1.7) r 14 (1.8)					
Academy School Dist. #20, CO Chicago Public Schools, IL Delaware Science Coalition, DE First in the World Consort., IL Fremont/Lincoln/WestSide PS, NE	64 (0.1) 79 (2.6) r 71 (1.9) 73 (0.9) 70 (1.0)	r 51 (0.1) r 52 (5.3) s 55 (1.9) r 65 (2.5) 67 (1.0)	25 (0.1) r 9 (1.6) r 17 (1.2) 18 (1.0) 22 (1.9)	0 (0.0) 2 (0.8) r 0 (0.3) 0 (0.2) r 0 (0.0)	11 (0.1) 11 (2.4) r 12 (1.8) 10 (0.9) 8 (2.0)					
Guilford County, NC Jersey City Public Schools, NJ Miami-Dade County PS, FL Michigan Invitational Group, MI Montgomery County, MD	55 (1.9) r 77 (1.0) s 72 (5.7) 78 (0.8) x x	47 (1.9) s 66 (2.2) s 59 (5.6) 62 (0.9) x x	25 (1.6) r 15 (0.8) s 11 (2.1) 10 (0.5) x x	r 5 (1.1) s 1 (0.0) s 2 (1.2) 0 (0.2) x x	15 (1.4) r 7 (0.4) s 15 (3.5) 12 (0.9) x x					
Naperville Sch. Dist. #203, IL Project SMART Consortium, OH Rochester City Sch. Dist., NY SW Math/Sci. Collaborative, PA	61 (0.8) 71 (1.3) r 66 (1.0) 72 (2.3)	52 (0.9) r 68 (1.3) r 59 (2.5) 64 (2.8)	20 (0.8) 17 (0.6) r 20 (0.9) 9 (1.1)	2 (0.2) 1 (0.1) r 5 (0.6) 2 (0.4)	17 (0.4) 11 (1.3) r 10 (1.1) 17 (2.0)					
International Avg. (All Countries)	71 (0.2)	58 (0.3)	10 (0.1)	4 (0.1)	17 (0.2)					

Background data provided by teachers.

1 Reflects total hours reported teaching general/integrated science, physical science, earth science, life science, biology, chemistry, and physics.

² Includes individual curriculum planning and cooperative curriculum planning.

- ³ Includes student supervision (other than teaching), student counseling/appraisal, other non-student contact time, and other activities.
- 4 Netherlands: Data in other activities category reflects the total reported for curriculum planning, administrative duties, and other activities.

5 Russian Federation: Formally scheduled school time is for instruction only; teachers are not formally scheduled for other activities.

States in *italics* did not fully satisfy guidelines for sample participation rates (see Appendix A for details).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A dash (--) indicates data are not available.



		Average N	umber of	f Instructional Day	s in the School Year ¹		
Koroa Pap of				0		225	(0.7)
lanan				0		223	(0.7)
Chinese Tainei						223	(0.0)
chinese taiper						221	(0.4)
Czech Benublic				.0		197	(0.0)
Russian Federation				°		195	(1.2)
Netherlands	r			•		191	(1.2)
England	r					190	(0.3)
Canada						188	(0.3)
First in the World Consort II	s		o			185	(0.3)
Montgomery County, MD	s					184	(0.6)
Michigan Invitational Group MI	5		0			183	(0.1)
Rochester City Sch. Dist., NY	r					182	(0.1)
Michigan			0			182	(0.3)
Connecticut	s		0			181	(0.3)
Pennsylvania			0			181	(0.4)
Marvland	r		0			181	(0.6)
Indiana			0			181	(0.2)
SW Math/Sci. Collaborative, PA			·····o			181	(0.5)
South Carolina			·····o			181	(0.4)
Chicago Public Schools, IL	r		·····o			180	(1.1) 6
Jersey City Public Schools, NJ			·····o			180	(0.0) ⁶
Massachusetts	S		·····o			180	(0.2)
Project SMART Consortium, OH	r		·····o			180	(0.1)
Texas	S		·····o			180	(0.9) ≧
Singapore			·····o			180	(0.0)
Guilford County, NC	r		·····o			180	ی بع (0.0)
North Carolina	r		·····o			180	(0.0) (0.0)
United States	r		·····o			180	(0.4) p
Delaware Science Coalition, DE	r		·····o			179	o.0) ک
Idaho	r		••••••			179	(0.5) fe
Fremont/Lincoln/WestSide PS, NE	r		·····o			179	(0.1) dtp
Illinois			·····o			179	(0.4) ≥
Naperville Sch. Dist. #203, IL			•••••••			178	(0.1) j
Oregon			····o			177	(3.2) (3.2)
Missouri	r		••••••••			176	(0.4)
Hong Kong, SAR	r		•••••••••••••••••••••••••••••••••••••••			176	(2.7) ¹
Belgium (Flemish)			•••••••			175	(0.0)
Academy School Dist. #20, CO			0			172	(0.0) (0.0)
Miami-Dade County PS, FL						х	x Sou
	1	00 150		200	250 3	00	
					International Avg.	400	(0.2)
					(All Countries)	193	(0.2)

Background data provided by schools.

1 Days reported averaged across students.

States in *italics* did not fully satisfy guidelines for sample participation rates (see Appendix A for details).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

An "r" indicates school response data available for 70-84% of students. An "s" indicates school response data available for 50-69% of students. An "x" indicates school response data available for <50% of students.



	Percenta	Percentage of Students Whose Teachers Report Most or Every Lesson								
	Explain Reasoning Behind an Idea	Represent and Analyze Relationships Using Tables, Charts, or Graphs	Work on Problems for Which There Is No Immediately Obvious Method of Solution	Write Explanations About What Was Observed and Why it Happened	Put Events or Objects in Order and Give a Reason for the Organization					
Countries										
United States	r 80 (3.2)	r 40 (3.1)	r 18 (2.3)	r 59 (3.3)	r 40 (3.3)					
Belgium (Flemish)	53 (3.4)	37 (2.6)	r 6 (1.5)	12 (2.0)	9 (1.7)					
Canada	r 85 (2.5)	r 35 (3.3)	r 17 (3.1)	r 78 (2.4)	r 36 (3.7)					
Chinese Taipei	42 (3.6)	35 (3.7)	14 (2.9)	57 (4.4)	34 (3.7)					
Czech Republic	89 (2.0)	17 (1.9)	10 (1.9)	32 (2.9)	32 (2.8)					
England	s 64 (4.8)	s 24 (3.7)	s 3 (1.2)	s 67 (4.6)	s 21 (3.7)					
Hong Kong, SAR	50 (4.6)	22 (4.0)	10 (2.6)	34 (4.2)	23 (3.5)					
Italy	88 (2.4)	44 (3.6)	25 (3.4)	46 (4.1)	43 (4.1)					
Japan Karaa Dan af	69 (4.1)	60 (4.0)	32 (4.0)	57 (4.0)	48 (4.2)					
когеа, кер. от	58 (4.0)	47 (4.0)	16 (2.9)	50 (3.6)	17 (3.0)					
Netherlands	57 (3.7)	15 (2.5)	18 (2.8)	34 (4.7)	20 (2.5)					
Russian Federation	55 (2.2)	35 (1.8)	10 (1.6)	36 (1.9)	71 (2.2)					
Singapore	03 (4.3)	13 (2.8)	8 (1.9)	44 (4.7)	30 (4.1)					
Connections	c 92 (E 0)	c (1) (0,0)	a 24 (C 4)	c (0 (C ()	c 24 (7 2)					
Connecticut	5 82 (5.0)	5 41 (8.8)	s 24 (0.4)	s 09 (0.0)	5 34 (7.3) r 35 (5.6)					
Illinois	75 (3.0)	37 (6.7)	1 12 (4.6)	51 (6.8)	31 (6.8)					
Indiana	70 (4.0) 86 (3.3)	30 (5.6)	21 (0.0) 36 (6.0)	69 (6 7)	37 (0.8)					
Maryland	r 85 (3.9)	s 60 (5.5)	s 29 (5.3)	s 79 (5.3)	s 40 (5.5)					
Massachusetts	84 (4.2)	49 (6 3)	24 (4 7)	r 68 (4.9)	r 36 (53)					
Michigan	r 81 (5.4)	r 46 (6.5)	r 18 (4.8)	r 63 (6.2)	r 36 (6.1)					
Missouri	r 81 (4.7)	r 43 (5.8)	r 24 (5.6)	r 54 (6.5)	r 39 (4.8)					
North Carolina	81 (5.9)	38 (7.0)	24 (5.2)	64 (4.9)	45 (4.7)					
Oregon	76 (6.1)	45 (6.5)	21 (6.0)	56 (6.6)	35 (5.3)					
Pennsylvania	77 (6.4)	38 (8.5)	9 (2.5)	51 (8.5)	33 (8.1)					
South Carolina	81 (5.6)	65 (4.3)	21 (4.5)	51 (6.6)	36 (5.6)					
Texas	r 81 (4.8)	r 64 (5.3)	r 27 (6.7)	r 69 (5.3)	r 59 (6.9)					
Districts and Consortia										
Academy School Dist. #20, CO	92 (0.1)	56 (0.4)	26 (0.3)	92 (0.1)	36 (0.3)					
Chicago Public Schools, IL	r 81 (8.5)	r 30 (10.7)	r 6 (3.6)	r 62 (10.5)	r 35 (11.7)					
Delaware Science Coalition, DE	r 86 (6.1)	r 24 (3.4)	r 18 (5.2)	r 49 (8.5)	r 33 (6.8)					
First in the World Consort., IL	82 (2.5)	33 (3.3)	36 (6.3)	69 (3.8)	35 (6.0)					
Fremont/Lincoln/WestSide PS, NE	71 (7.6)	56 (3.7)	15 (6.9)	62 (7.0)	19 (8.5)					
Guilford County, NC	91 (2.6)	62 (4.3)	47 (5.9)	61 (5.2)	35 (5.0)					
Jersey City Public Schools, NJ	r 79 (2.0)	r 57 (4.3)	r 24 (6.7)	r 71 (6.3)	r 40 (4.9)					
Miami-Dade County PS, FL	s 82 (8.5)	s 40 (9.2)	s 13 (4.6)	s 79 (5.9)	s 48 (8.4)					
Michigan Invitational Group, MI	67 (1.9)	33 (4.5)	7 (0.7)	55 (6.1)	29 (5.5)					
Montgomery County, MD	XX	XX	XX	XX	XX					
Naperville Sch. Dist. #203, IL	100 (0.0)	79 (1.0)	29 (1.9)	98 (0.6)	44 (4.2)					
Project SMART Consortium, OH	r /0 (3.5)	r 46 (4.0)	r 18 (3.5)	r 50 (3.1)	r 28 (4.2)					
Kochester City Sch. Dist., NY	r 94 (3.7)	r 26 (5.5)	r 10 (3.7)	r 69 (4.8)	г 16 (3.8) эв. (г.г.)					
SW Wath/Sci. Collaborative, PA	85 (5.2)	27 (5.0)	23 (7.3)	48 (8.0)	28 (5.5)					
International Avg				F2 (2 2)						
(All Countries)	68 (0.6)	35 (0.5)	15 (0.4)	52 (0.6)	42 (0.6)					

Background data provided by teachers.

Reference

States in *italics* did not fully satisfy guidelines for sample participation rates (see Appendix A for details).

3

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.



Chemistry

76 (1.9)

75 (1.6)

68 (0.5)

_ _

8th Grade Science

Physics

81 (2.3) 53 (2.3)

56 (2.7)

69 (1.7)

61 (0.5)

Participants with General/		c	Countries with Se	parate Science S	ubjects
Integrated Scienc	e		Earth Science	Biology	Ph
es		Belgium (Flemish)	13 (1.0)	71 (1.5)	81
United States	71 (1.1)	Czech Republic	6 (0.8)	24 (1.8)	53
Canada	77 (1.2)	Netherlands ^b	7 (0.9)	32 (2.8)	56

Percentage of Students Reporting Almost Always or Pretty Often

Russian Federation 17 (1.1) 37 (1.7) International Avg. 19 (0.3) 42 (0.4) (All Separate Science Countries)

United States	71 (1.1)
Canada	77 (1.2)
Chinese Taipei a	70 (1.3)
England	91 (0.9)
Hong Kong, SAR	88 (0.9)
Italy	29 (1.6)
Japan	75 (1.5)
Korea, Rep. of	53 (1.7)
Singapore	88 (1.0)
States	
Connecticut	78 (2.6)
Idaho	74 (2.3)
Illinois	73 (2.1)
Indiana	73 (1.9)
Maryland	79 (1.6)
Massachusetts	76 (2.2)
Michigan	75 (2.0)
Missouri	67 (3.0)
North Carolina	73 (2.2) 66
Oregon	78 (1.8)
Pennsylvania	69 (3.0)
South Carolina	73 (2.6) SS
Texas	73 (2.3)
Districts and Consortia	Stud
Academy School Dist. #20, CO	84 (1.0) eg
Chicago Public Schools, IL	⁶⁰ (3.8)
Delaware Science Coalition, DE	71 (2.6) ^p
First in the World Consort., IL	<u>ප</u> ුදු: (1.5)
Fremont/Lincoln/WestSide PS, NE	76 (1.9)
Guilford County, NC	75 (2.1) Te
Jersey City Public Schools, NJ	71 (1.7)
Miami-Dade County PS, FL	75 (3.2) ^{.9}
Michigan Invitational Group, MI	74 (1.5) ¹
Montgomery County, MD	76 (2.1)
Naperville Sch. Dist. #203, IL	81 (1.0)
Project SMART Consortium, OH	75 (1.5)
Rochester City Sch. Dist., NY	s 83 (2.5)
SW Math/Sci. Collaborative, PA	69 (3.2) _O
International Aug	
(All General Science Countries)	71 (0.3)

Countries

Background data provided by students.

- Countries administered either a general/integrated science or separate subject area form of the questionnaire. In countries that administered the separate subject area form, students were asked about each subject area separately. Percentages for separate science subject areas are based only on those students taking each subject.
- $^{\rm a}$ $\,$ Chinese Taipei: Students were asked about 'natural science'; data pertain to grade 8 $\,$ physics/chemistry course.
- $^{\rm b}$ $\,$ Netherlands: Data for physics/chemistry teachers are reported in the physics panel.
- States in *italics* did not fully satisfy guidelines for sample participation rates (see Appendix A for details).
- () Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.
- A dash (--) indicates data are not available.
- An "s" indicates a 50-69% student response rate.



Percentage of Students Reporting Almost Always or Pretty Often									
Participants with Ger	neral/	C	Countries with Separate Science Subjects						
integrated Science	le		Earth Science	Biology	Physics	Chemistry			
Countries		Belgium (Flemish)	8 (0.7)	36 (1.6)	61 (3.1)				
United States	65 (1.5)	Czech Republic	5 (0.5)	25 (2.0)	31 (2.2)	39 (2.4)			
Canada	69 (1.4)	Netherlands ^b	5 (0.8)	20 (2.2)	41 (2.9)				
Chinese Taipei ^a	57 (1.6)	Russian Federation	13 (0.9)	20 (1.0)	41 (1.6)	41 (1.8)			
England	89 (1.1)								
Hong Kong, SAR	77 (1.2)	International Avg.	15 (0.3)	27 (0.4)	39 (0.5)	39 (0.5)			
Italy	18 (1.1)	Science Countries)	15 (0.5)	27 (0.4)	55 (0.5)	55 (0.5)			
Japan	79 (1.7)								
Korea, Rep. of	46 (1.5)								
Singapore	65 (1.4)								
States									
Connecticut	75 (2.9)								
Idaho	60 (3.1)								
Illinois	64 (2.9)								
Indiana	66 (2.5)								
Maryland	77 (1.8)								
Massachusetts	70 (2.8)								
Michigan	72 (2.3)								
Missouri	60 (2.7)	Ċ.							
North Carolina	64 (2.7)	5661							
Oregon	73 (2.4)	-86							
Pennsylvania	61 (3.1)	, 19							
South Carolina	63 (3.1)	MSS							
Texas	62 (2.5)	E A							
Districts and Consortia		Stuc							
Academy School Dist. #20, CO	87 (0.9)	ance							
Chicago Public Schools, IL	44 (4.5)	1 Scie							
Delaware Science Coalition, DE	65 (2.5)	and							
First in the World Consort., IL	86 (2.6)	atics							
Fremont/Lincoln/WestSide PS, NE	78 (2.0)	hem							
Guilford County, NC	65 (2.4)	Mat							
Jersey City Public Schools, NJ	55 (1.9)	onal							
Miami-Dade County PS, FL	00 (3.3) 72 (1.0)	rnati							
Michigan Invitational Group, Mi	73 (1.0)	Inter							
Montgomery County, MD	75 (2.5)	hird							
Naperville Sch. Dist. #203, IL	89 (1.1)	EA T							
Project SwiAki Consortium, OH	(1.5) من (7. (2. 7)	CEI							
SW/ Math/Sci Collaborativa DA	5 // (2./)	OUR							
Sw wath/sci. Collaborative, PA	58 (5.8)	Ň							
International Avg. (All General Science Countries)	57 (0.3)								

Background data provided by students.

- * Countries administered either a general/integrated science or separate subject area form of the questionnaire. In countries that administered the separate subject area form, students were asked about each subject area separately. Percentages for separate science subject areas are based only on those students taking each subject.
- ^a Chinese Taipei: Students were asked about 'natural science'; data pertain to grade 8 physics/chemistry course.
- $^{\rm b}$ $\,$ Netherlands: Data for physics/chemistry teachers are reported in the physics panel.
- States in *italics* did not fully satisfy guidelines for sample participation rates (see Appendix A for details).
- () Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.
- A dash (--) indicates data are not available.
- An "s" indicates a 50-69% student response rate.



Chemistry

_ _

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31 (1.4)

37 (1.4)

38 (0.4)

8th Grade Science

Physics

40 (1.8)

39 (1.7)

31 (1.6)

41 (1.1)

42 (0.4)

Participants with General/		Countries with Separate Science Subject					
			Earth Science	Biology	Ph		
Countries		Belgium (Flemish)	29 (0.9)	35 (1.1)	40		
United States	50 (1.0)	Czech Republic	31 (1.4)	37 (1.5)	39		
Canada	51 (0.9)	Netherlands ^b	33 (1.7)	42 (2.0)	31		
Chinese Taipei *	66 (1.2)	Russian Federation	39 (1.7)	43 (1.3)	41		
England	51 (1.2)	Internetional Ave					
Hong Kong, SAR	63 (1.0)	(All Science	34 (0.4)	41 (0.4)	42		
Italy	31 (1.1)	Separate Countries)					
Japan	21 (1.1)						
Korea, Rep. of	39 (1.1)						
Singapore	64 (1.2)						
states	54 (4.0)						
Connecticut	51 (1.9)						
Idano	49 (1.7)						
Illinois	50 (1.8)						
Indiana	4/ (1.9)						
Marsa duratta	32 (1.3)						
Massachusetts	48 (1.5)						
Michigan	49 (1.8)						
Missouri North Carolina	49 (2.0)	ğ					
Oregon	20 (1.0) 48 (1.8)	561-					
Pennsylvania	48 (1.8)	8 6 6					
South Carolina	51 (1.9)	(S), 1					
Texas	47 (1.7)	SWII					
Districts and Consortia) Apr					
Academy School Dist. #20, CO	50 (1.4)	e Stu					
Chicago Public Schools, IL	51 (2.6)	tienc					
Delaware Science Coalition, DE	49 (2.1)	S pi					
First in the World Consort., IL	49 (2.0)	CS ar					
Fremont/Lincoln/WestSide PS, NE	53 (2.1)	ati. D					
Guilford County, NC	52 (1.4)	athe					
Jersey City Public Schools, NJ	59 (2.0)	Š le					
Miami-Dade County PS, FL	64 (2.0)	tion					
Michigan Invitational Group, MI	48 (1.8)	erna					
Montgomery County, MD	48 (1.8)						
Naperville Sch. Dist. #203, IL	60 (1.4)	Thir					
Project SMART Consortium, OH	50 (1.7)	IEA					
Rochester City Sch. Dist., NY	s 65 (2.7)	RCE					
SW Math/Sci. Collaborative, PA	45 (2.2)	sou					
International Avg. (All General Science Countries)	49 (0.2)						

Background data provided by students.

- * Countries administered either a general/integrated science or separate subject area form of the questionnaire. In countries that administered the separate subject area form, students were asked about each subject area separately. Percentages for separate science subject areas are based only on those students taking each subject.
- ^a Chinese Taipei: Students were asked about 'natural science'; data pertain to grade 8 physics/chemistry course.
- ^b Netherlands: Data for physics/chemistry teachers are reported in the physics panel.
- States in *italics* did not fully satisfy guidelines for sample participation rates (see Appendix A for details).
- () Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.
- A dash (--) indicates data are not available.

An "s" indicates a 50-69% student response rate.



Normal Process and the series of the series		Percentage of students laught by feachers							
Box More Than 20 or Less Box Than 20 or Less More Than 20 or Less Dow Than 20 or Less More Than 20 or Less		Assigning Homework Three Times a Week or More Often		Assigning Homework Once or Twice a Week		Assigning Homework Less Than Once a Week		Never Assigning	
Countries Minutes of Less Minutes or Less Minutes or Less Countries United States r 35 (3.8) 8 (1.4) 32 (3.5) 11 (2.0) 10 (2.1) 2 (0.7) 3 (1.6) Belgium (Flemish) 0 (0.0) 0 (0.0) 7 (2.0) 1 (0.6) 68 (3.5) 10 (2.1) 14 (2.6) 3 (1.4) 0 (0.0) Canada 19 (2.7) 6 (2.1) 50 (3.5) 8 (1.8) 14 (2.6) 3 (1.4) 0 (0.0) Canada 19 (2.7) 6 (2.1) 7 (2.2) 42 (4.3) 19 (3.2) 20 (3.3) 4 (1.6) 5 (0.9) Lingland 3 (1.7) 0 (0.0) 53 (4.3) 13 (2.8) 19 (3.6) 13 (2.9) 1 (0.0) Hong Kong, SAR r 1 (0.8) 2 (1.1) 1 (1.0) 27 (3.6) 6 (2.0) 37 (3.8) 16 (2.7) 3 (0.8) 1 (0.7) Russian Federation 12 (1.4) 6 (0.9) 53 (2.5) 26 (2.4) 3 (0.8) 1 (0.7) 1 (0.7) States Cannecticut		30 Minutes	More Than 30	30 Minutes	More Than 30	30 Minutes	More Than 30	Homework	
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Cach Republic 0 0.0.0.0 20 2.2.0.4.0 0 0.0.3.0 7.4 2.5.0 1 0.0.0.0 England 3 1.7.1 0 0.0.0.0 51 4.3.3 13 2.8.0 13 2.9 1 0.0.0.0 Italy 3 (1.0) 53 (4.3) 13 10.0.0 53 (3.3) 34 (4.2) 2.0 0.0.0.0 Italy 3 (1.0) 10.0.0 53 (2.0) 37 (3.8) 16 (2.7) 3 (0.0.0) Russian Federation 12 (1.0) 27 (3.0) 2.0 (3.0) 2.0 (3.0) 2.0 2.5 (2.0) 4.1 11 (2.4) 1.0.0 <	Chinese Taipei	8 (2.4)	7 (2.2)	42 (4.3)	19 (3.2)	20 (3.3)	4 (1.6)	0 (0.0)	
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Korea, Rep. of 9 (2.5) 1 (1.0) 27 (3.6) 6 (2.0) 37 (3.8) 16 (2.7) 3 (0.8) Netherlands 6 (1.8) 2 (1.1) 72 (3.2) 4 (1.1) 15 (3.4) 1 (0.4) 1 (0.7) Russian Federation 12 (1.4) 6 (0.9) 53 (2.5) 25 (2.4) 3 (0.8) 0 (0.2) 0 (0.2) Singapore 9 (2.6) 5 (1.4) 44 (4.0) 30 (4.1) 11 (2.4) 2 (1.1) 1 (0.6) States T Connecticut 66 (6.8) 13 (4.6) 16 (4.8) 2 (0.3) 1 (0.1) 6 (3.7) Illinois 38 (6.8) 8 (3.2) 33 (7.4) 7 (2.4) 14 (4.4) 1 (0.6) 0 (0.0) Masyachusetts 59 (5.7) 18 (3.9) 20 (5.1) 3 (1.8) 0 (0.0) 0 (0.0) 0 (0.0) 0 (0.0) Missouri 27 (5.5) 3 (2.3) 39 (6.6) 10 (3.4) 9 (3.6) 3 (2.7) 0 (0.0) 0 (0.0) Morth Carolina 44 (6.5) 4 (2.0) 33 (3.2) 2 (1.0) 3 (3.1) <td>Japan s</td> <td>2 (1.1)</td> <td>1 (1.0)</td> <td>10 (2.6)</td> <td>3 (1.3)</td> <td>43 (4.2)</td> <td>23 (3.6)</td> <td>20 (3.4)</td>	Japan s	2 (1.1)	1 (1.0)	10 (2.6)	3 (1.3)	43 (4.2)	23 (3.6)	20 (3.4)	
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Fremont/Lincoln/WestSide PS, NE 18 (3.3) 3 (3.0) 29 (8.2) 4 (3.7) 39 (4.6) 0 (0.0) 7 (7.0) Guilford County, NC 27 (5.2) 0 (0.0) 54 (5.1) 5 (1.8) 13 (3.7) 0 (0.0) 0 (0.0) 0 (0.0) Jersey City Public Schools, NJ 43 (4.6) 15 (3.2) 34 (4.6) 4 (0.5) 3 (0.3) 0 (0.0) 0 (0.0) Miami-Dade County PS, FL 40 (10.5) 15 (5.2) 27 (9.0) 12 (4.7) 4 (3.7) 1 (0.1) 0 (0.0) Michigan Invitational Group, MI 39 (6.2) 6 (1.1) 33 (6.9) 22 (2.9) 0 (0.0) 0 (0.0) 0 (0.0) Montgomery County, MD x x x x x x x x x x x x x x Naperville Sch. Dist. #203, IL 79 (2.9) 17 (2.8) 4 (0.6) 0 (0.0) 0 (0.0) 0 (0.0) 0 (0.0) 0 (0.0) Project SMART Consortium, OH 31 (4.0) 1 (0.9) 34 (3.2) 21 (3.3) 13 (2.9) 0 (0.0) 0 (0.0) Rochester City Sch. Dist., NY 16 (4.3)	First in the World Consort., IL	67 (7.3)	4 (3.5)	17 (5.7)	0 (0.0)	10 (1.6)	1 (0.1)	0 (0.0)	
Guilford County, NC 27 5.2 0 0.00 54 5 1.3 1.3 0 0.00 0 0.00 Jersey City Public Schools, NJ 43 (4.6) 15 (3.2) 34 (4.6) 4 (0.5) 3 (0.3) 0 (0.0) 0 (0.0) Miami-Dade County PS, FL 40 (10.5) 15 (5.2) 27 (9.0) 12 (4.7) 4 (3.7) 1 (0.1) 0 (0.0) Michigan Invitational Group, MI 39 (6.2) 6 (1.1) 33 (6.9) 22 (2.9) 0 (0.0) 0 (0.0) Montgomery County, MD x x <td>Fremont/Lincoln/WestSide PS, NE</td> <td>18 (3.3)</td> <td>3 (3.0)</td> <td>29 (8.2)</td> <td>4 (3.7)</td> <td>39 (4.6)</td> <td>0 (0.0)</td> <td>7 (7.0)</td>	Fremont/Lincoln/WestSide PS, NE	18 (3.3)	3 (3.0)	29 (8.2)	4 (3.7)	39 (4.6)	0 (0.0)	7 (7.0)	
Jersey City Public Schools, NJ 43 (4.6) 15 (3.2) 34 (4.6) 4 (0.5) 3 (0.3) 0 (0.0) 0 (0.0) Miami-Dade County PS, FL 40 (10.5) 15 (5.2) 27 (9.0) 12 (4.7) 4 (3.7) 1 (0.1) 0 (0.0) Michigan Invitational Group, MI 39 (6.2) 6 (1.1) 33 (6.9) 22 (2.9) 0 (0.0) 0 (0.0) 0 (0.0) Montgomery County, MD x x x x x x x x x x x x x x Naperville Sch. Dist. #203, IL 79 (2.9) 17 (2.8) 4 (0.6) 0 (0.0) 0 (0.0) 0 (0.0) Project SMART Consortium, OH 31 (4.0) 1 (0.9) 34 (3.2) 21 (3.3) 13 (2.9) 0 (0.0) 0 (0.0) Rochester City Sch. Dist., NY 16 (4.3) 18 (3.4) 24 (5.3) 25 (5.0) 17 (5.5) 0 (0.0) 0 (0.0)	Guilford County, NC	27 (5.2)	0 (0.0)	54 (5.1)	5 (1.8)	13 (3.7)	0 (0.0)	0 (0.0)	
Miami-Dade County PS, FL 40 (10.5) 15 (5.2) 27 (9.0) 12 (4.7) 4 (3.7) 1 (0.1) 0 (0.0) Michigan Invitational Group, MI 39 (6.2) 6 (1.1) 33 (6.9) 22 (2.9) 0 (0.0) 0 (0.0) 0 (0.0) Montgomery County, MD x x <td>Jersey City Public Schools, NJ</td> <td>43 (4.6)</td> <td>15 (3.2)</td> <td>34 (4.6)</td> <td>4 (0.5)</td> <td>3 (0.3)</td> <td>0 (0.0)</td> <td>0 (0.0)</td>	Jersey City Public Schools, NJ	43 (4.6)	15 (3.2)	34 (4.6)	4 (0.5)	3 (0.3)	0 (0.0)	0 (0.0)	
Michigan Invitational Group, MI 39 (6.2) 6 (1.1) 33 (6.9) 22 (2.9) 0 (0.0) 0 (0.0) 0 (0.0) Montgomery County, MD x x x x x x x x x x x x x x x x Naperville Sch. Dist. #203, IL 79 (2.9) 17 (2.8) 4 (0.6) 0 (0.0) 0 (0.0) 0 (0.0) 0 (0.0) Project SMART Consortium, OH 31 (4.0) 1 (0.9) 34 (3.2) 21 (3.3) 13 (2.9) 0 (0.0) 0 (0.0) Rochester City Sch. Dist., NY 16 (4.3) 18 (3.4) 24 (5.3) 25 (5.0) 17 (5.5) 0 (0.0) 0 (0.0)	Miami-Dade County PS, FL	40 (10.5)	15 (5.2)	27 (9.0)	12 (4.7)	4 (3.7)	1 (0.1)	0 (0.0)	
Montgomery County, MD X X	Michigan Invitational Group, MI	39 (6.2)	6 (1.1)	33 (6.9)	22 (2.9)	0 (0.0)	0 (0.0)	0 (0.0)	
Naperville Sch. Dist. #203, IL 79 (2.9) 17 (2.8) 4 (0.6) 0 (0.0) <t< td=""><td>Montgomery County, MD</td><td>хх</td><td>хх</td><td>ХХ</td><td>хх</td><td>ХХ</td><td>хх</td><td>ХХ</td></t<>	Montgomery County, MD	хх	хх	ХХ	хх	ХХ	хх	ХХ	
Project SMART Consortium, OH 31 (4.0) 1 (0.9) 34 (3.2) 21 (3.3) 13 (2.9) 0 (0.0) 0 (0.0) Rochester City Sch. Dist., NY 16 (4.3) 18 (3.4) 24 (5.3) 25 (5.0) 17 (5.5) 0 (0.0) 0 (0.0)	Naperville Sch. Dist. #203, IL	79 (2.9)	17 (2.8)	4 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
Rochester City Sch. Dist., NY 16 (4.3) 18 (3.4) 24 (5.3) 25 (5.0) 17 (5.5) 0 (0.0) 0 (0.0)	Project SMART Consortium, OH	31 (4.0)	1 (0.9)	34 (3.2)	21 (3.3)	13 (2.9)	0 (0.0)	0 (0.0)	
	Rochester City Sch. Dist., NY	16 (4.3)	18 (3.4)	24 (5.3)	25 (5.0)	17 (5.5)	0 (0.0)	0 (0.0)	
SW Math/Sci. Collaborative, PA 30 (7.2) 4 (2.3) 43 (6.2) 5 (3.0) 14 (5.1) 3 (1.2) 2 (1.3)	SW Math/Sci. Collaborative, PA	30 (7.2)	4 (2.3)	43 (6.2)	5 (3.0)	14 (5.1)	3 (1.2)	2 (1.3)	
International Avg. 15 (0.4) 5 (0.3) 37 (0.6) 15 (0.4) 20 (0.4) 5 (0.3) 3 (0.2) (All Countries)	International Avg. (All Countries)	15 (0.4)	5 (0.3)	37 (0.6)	15 (0.4)	20 (0.4)	5 (0.3)	3 (0.2)	

Percentage of Students Taught by Teachers

Background data provided by teachers.

Reference

- States in *italics* did not fully satisfy guidelines for sample participation rates (see Appendix A for details).
- () Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.



		Sometimes or Always		Never or Rarely		
		Percent of	Average	Percent of Average		
		Students	Achievement	Students	Achievement	
Countries	_					
United States	r	58 (3.4)	521 (6.6)	42 (3.4)	519 (5.3)	
Belgium (Flemish)	r	11 (2.5)	534 (10.5)	89 (2.5)	537 (4.4)	
Canada	r	56 (3.4)	532 (3.5)	44 (3.4)	538 (4.6)	
Chinese Taipei		6 (2.1)	566 (14.4)	94 (2.1)	569 (4.5)	
Czech Republic		12 (1.8)	550 (10.0)	88 (1.8)	540 (4.1)	
England	S	24 (4.2)	563 (14.3)	76 (4.2)	542 (6.0)	
Hong Kong, SAR		10 (2.6)	551 (8.1)	90 (2.6)	527 (4.2)	
Italy		44 (4.1)	493 (5.4)	56 (4.1)	493 (5.3)	
Japan	r	4 (1.9)	558 (9.0)	96 (1.9)	550 (2.2)	
Korea, Rep. of		35 (4.0)	552 (3.7)	65 (4.0)	547 (3.4)	
Netherlands		27 (2.9)	549 (7.2)	73 (2.9)	544 (8.9)	
Russian Federation		29 (2.0)	538 (12.8)	71 (2.0)	526 (5.3)	
Singapore		38 (4.3)	575 (11.0)	62 (4.3)	563 (10.0)	
States						
Connecticut	S	63 (6.0)	531 (14.2)	37 (6.0)	540 (10.6)	
Idaho	S	51 (4.9)	531 (7.0)	49 (4.9)	523 (9.8)	
Illinois		45 (7.9)	522 (9.3)	55 (7.9)	530 (7.2)	
Indiana	r	69 (5.9)	537 (8.2)	31 (5.9)	537 (10.8)	
Maryland	S	61 (5.9)	505 (9.4)	39 (5.9)	503 (12.3)	
Massachusetts	r	55 (5.3)	521 (9.8)	45 (5.3)	554 (8.8)	
Michigan	r	53 (6.5)	564 (7.1)	47 (6.5)	544 (10.7)	
Missouri	r	54 (4.5)	523 (12.1)	46 (4.5)	528 (5.4)	
North Carolina		60 (3.7)	509 (10.2)	40 (3.7)	502 (7.9)	
Oregon		68 (6.0)	544 (6.8)	32 (6.0)	532 (10.8)	
Pennsylvania		52 (6.6)	532 (9.1)	48 (6.6)	526 (6.5)	
South Carolina		59 (6.3)	516 (8.7)	41 (6.3)	510 (9.7)	
Texas	S	62 (7.6)	535 (10.1)	38 (7.6)	478 (16.8)	
Districts and Consortia	_					
Academy School Dist. #20, CO		69 (0.6)	561 (2.6)	31 (0.6)	555 (3.5)	
Chicago Public Schools, IL	r	50 (10.7)	451 (19.4)	50 (10.7)	456 (12.2)	
Delaware Science Coalition, DE	S	37 (5.6)	499 (17.4)	63 (5.6)	501 (13.1)	
First in the World Consort., IL		78 (3.4)	559 (6.4)	22 (3.4)	581 (9.2)	
rremont/Lincoin/WestSide PS, NE	r	63 (7.1)	508 (12.7)	37 (7.1)	520 (8.0)	
Guilford County, NC		68 (5.1)	548 (9.0)	32 (5.1)	503 (17.9)	
Jersey City Public Schools, NJ	r	81 (1.9)	451 (10.1)	19 (1.9)	439 (7.7)	
Miami-Dade County PS, FL	S	81 (5.9)	421 (11.5)	19 (5.9)	4/2 (13./)	
Montgomon County MD		48 (3.1)	561 (6./)	52 (3.1)	568 (9.7)	
Moneguille Set Dist (202.)		X X		X X	X X	
Naperville Sch. Dist. #203, IL		92 (0.8)	582 (4.6)	8 (0.8)	610 (13.0)	
Project SIVIAKI Consortium, OH	r	44 (4.0)	520 (12.0)	50 (4.U)	546 (11.5)	
Kocnester City Sch. Dist., NY	r	18 (4.7)	403 (11.5)	82 (4.7)	447 (10.4)	
Svv Wath/Sci. Collaborative, PA		01 (8.0)	542 (8.5)	39 (8.0)	548 (12.9)	
International Ava		24 (2.5)	104 (1 1)			
(All Countries)		34 (0.6)	491 (1.4)	66 (0.6)	485 (1.0)	

Background data provided by teachers.

* Based on average response to questions about assigning homework based on small investigation(s) or gathering data, working individually on long term projects or experiments, and working as a small group on long term projects or experiments.

States in *italics* did not fully satisfy guidelines for sample participation rates (see Appendix A for details).

An "r" indicates teacher response data available for 70-84% of students. An "s" indicates teacher response data available for 50-69% of students. An "x" indicates teacher response data available for <50% of students.

⁽⁾ Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Exhibit R3.13

States

27 (1.7)

64 (1.3)

78 (1.8)

79 (2.2)

76 (2.7)

74 (2.3)

70 (2.0)

80 (1.5)

73 (3.0) 79 (1.4)

85 (1.9)

70 (2.3)

75 (2.3)

85 (1.6)

77 (1.9)

73 (1.2)

78 (3.7)

73 (2.8)

76 (2.1)

69 (3.0)

82 (2.4)

75 (2.0)

76 (2.1)

77 (1.7)

58 (3.1)

85 (0.6)

77 (1.6)

81 (1.7)

74 (1.4)

58 (0.3)

S

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999

Korea, Rep. of

Singapore

Connecticut

Idaho

Illinois

Indiana

Maryland

Michigan

Missouri North Carolina

Oregon

Texas

Pennsylvania

South Carolina

Chicago Public Schools, IL

Delaware Science Coalition, DE

Fremont/Lincoln/WestSide PS, NE

First in the World Consort., IL

Jersey City Public Schools, NJ

Michigan Invitational Group, MI

Miami-Dade County PS, FL

Montgomery County, MD

Naperville Sch. Dist. #203, IL

Rochester City Sch. Dist., NY

International Avg.

Project SMART Consortium, OH

SW Math/Sci. Collaborative, PA

(All General Science Countries)

Guilford County, NC

Districts and Consortia Academy School Dist. #20, CO

Massachusetts



8th Grade Science

Fertentage of students Reporting Annost Always of Fletty Often									
Participants with General/ Integrated Science		Countries with Separate Science Subjects							
			Earth Science	Biology	Physics	Chemistry			
Countries		Belgium (Flemish)	45 (1.9)	55 (1.5)	58 (2.4)				
United States	77 (1.2)	Czech Republic	37 (2.2)	40 (2.1)	38 (1.7)	45 (2.2)			
Canada	62 (1.8)	Netherlands ^b	49 (2.7)	56 (3.1)	51 (2.7)				
Chinese Taipei a	74 (1.3)	Russian Federation	65 (1.2)	66 (1.5)	75 (1.1)	77 (1.2)			
England	63 (1.7)								
Hong Kong, SAR	36 (1.8)	International Avg. (All Separate	46 (0.5)	49 (0.5)	51 (0.4)	52 (0.5)			
Italy	35 (1.4)	Science Countries)	40 (0.5)	45 (0.5)	51 (0)	52 (0.5)			
Japan	29 (1.8)								

Porcentage of Students Penerting Almost Always or Protty Off

Background data provided by students.

- Countries administered either a general/integrated science or separate subject area form of the questionnaire. In countries that administered the separate subject area form, students were asked about each subject area separately. Percentages for separate science subject areas are based only on those students taking each subject.
- ^a Chinese Taipei: Students were asked about 'natural science'; data pertain to grade 8 physics/chemistry course.
- b Netherlands: Data for physics/chemistry teachers are reported in the physics panel.
- States in *italics* did not fully satisfy guidelines for sample participation rates (see Appendix A for details).
- () Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.
- A dash (--) indicates data are not available.
- An "s" indicates a 50-69% student response rate.