

on average, these factors impacted instruction at least somewhat. The remaining students fell in the medium category. The results show that average science achievement is related to the impact of student characteristics on classroom instruction, with lower achievement related to having more instructionally challenging and diverse students in the class. On average, internationally, 21 percent of the students were in such classrooms.



	31 (0.8)	30 (2.5)	470 (7.6)	40 (3.4)	46 (6.4)	(1.)	443 (7.4)	21 (2.8)	455 (5.8)
	26 (0.4)	33 (3.8)	524 (7.7)	65 (3.)	52 (4.2)	2 (0.)	/ /	0 (0.0)	/ /
	32 (0.2)	5 (0.8)	452 (7.4)	53 (2.3)	440 (2.2)	3 (2.2)	432 (3.2)	3 (0.0)	455 (6.0)
	20 (0.3)	88 (2.4)	515 (2.6)	12 (2.4)	532 (7.6)	0 (0.0)	/ /	0 (0.0)	/ /
	37 (0.4)	2 (0.)	/ /	14 (2.7)	3 2 (14.2)	57 (4.)	357 (3.7)	27 (4.6)	363 (6.1)
	22 (0.6)	68 (4.7)	483 (4.)	27 (4.2)	478 (.0)	4 (3.0)	428 (5.0)	1 (0.0)	/ /
	35 (0.4)	8 (1.5)	412 (16.6)	25 (2.7)	408 (6.0)	45 (3.6)	416 (5.)	22 (3.6)	415 (6.)
	37 (0.4)	4 (1.5)	584 (21.1)	14 (2.8)	554 (7.8)	66 (4.1)	563 (3.)	17 (3.2)	607 (6.3)
	25 (0.1)	30 (1.7)	443 (3.2)	70 (1.7)	43 (2.3)	0 (0.0)	/ /	0 (0.0)	/ /
	3 (0.7)	2 (1.1)	/ /	8 (1.)	452 (11.1)	58 (4.7)	418 (5.1)	31 (4.3)	418 (7.)
	28 (0.4)	27 (2.7)	545 (3.7)	45 (4.1)	54 (4.0)	28 (3.3)	565 (5.2)	0 (0.2)	/ /
	37 (1.1)	17 (2.8)	205 (12.2)	17 (3.1)	224 (13.8)	28 (4.0)	273 (11.7)	38 (5.0)	266 (12.3)
	40 (0.3)	0 (0.0)	/ /	4 (1.6)	481 (22.0)	52 (4.2)	548 (5.3)	44 (4.3)	574 (4.5)
	23 (0.4)	60 (4.1)	535 (3.8)	37 (4.1)	551 (5.2)	3 (1.2)	58 (12.8)	0 (0.0)	/ /
	40 (0.5)	3 (1.7)	437 (27.3)	8 (2.3)	3 1 (1.6)	41 (4.2)	420 (7.1)	48 (4.4)	42 (5.8)
	2 (0.4)	21 (2.)	442 (4.6)	4 (4.3)	456 (4.0)	26 (3.7)	457 (5.0)	4 (1.5)	448 (11.0)
	34 (0.4)	10 (2.3)	507 (14.1)	18 (3.5)	4 4 (8.4)	6 (4.1)	484 (4.1)	3 (1.4)	522 (15.2)
	22 (0.3)	78 (3.1)	4 0 (3.2)	22 (3.1)	4 6 (8.4)	0 (0.0)	/ /	0 (0.0)	/ /
	35 (0.2)	2 (1.0)	/ /	18 (2.4)	547 (3.0)	7 (2.3)	552 (2.4)	1 (1.0)	/ /
	35 (0.6)	13 (2.6)	481 (7.3)	25 (3.5)	473 (12.0)	33 (4.4)	465 (6.0)	2 (3.8)	482 (6.8)
	37 (0.4)	1 (0.8)	/ /	20 (2.8)	550 (4.5)	56 (4.3)	562 (2.1)	23 (3.5)	566 (4.5)
	28 (0.)	44 (3.6)	504 (3.8)	38 (3.8)	520 (4.3)	6 (1.5)	517 (.4)	13 (2.6)	520 (.3)
	28 (0.6)	35 (3.6)	385 (7.)	44 (4.4)	388 (6.)	15 (2.4)	417 (11.)	6 (2.7)	435 (7.8)
	25 (0.3)	3 (2.7)	510 (3.)	61 (2.7)	523 (2.4)	0 (0.3)	/ /	0 (0.2)	/ /
	28 (0.4)	26 (3.5)	44 (8.4)	57 (3.)	451 (5.7)	16 (3.4)	448 (11.)	1 (1.1)	/ /
	37 (0.4)	2 (0.8)	/ /	18 (3.5)	51 (10.2)	5 (4.6)	507 (4.4)	22 (3.4)	515 (.4)
	25 (0.5)	54 (4.4)	465 (5.6)	38 (4.4)	473 (5.)	5 (1.2)	481 (10.)	3 (1.1)	484 (12.)
	41 (1.2)	(4.2)	3 5 (12.6)	22 (5.0)	3 5 (7.5)	16 (3.6)	420 (11.4)	53 (4.)	3 1 (5.7)
	26 (0.3)	30 (3.7)	521 (8.0)	6 (3.)	545 (4.6)	1 (1.2)	/ /	0 (0.0)	/ /
	27 (0.4)	22 (3.4)	502 (7.2)	72 (4.0)	526 (6.5)	6 (3.6)	557 (10.)	0 (0.0)	/ /
	25 (0.3)	33 (3.8)	4 8 (3.6)	65 (3.7)	4 0 (2.8)	0 (0.0)	/ /	1 (0.8)	/ /
	3 (0.6)	7 (2.1)	442 (17.2)	16 (2.7)	445 (6.8)	28 (3.7)	440 (7.2)	48 (3.5)	431 (4.7)

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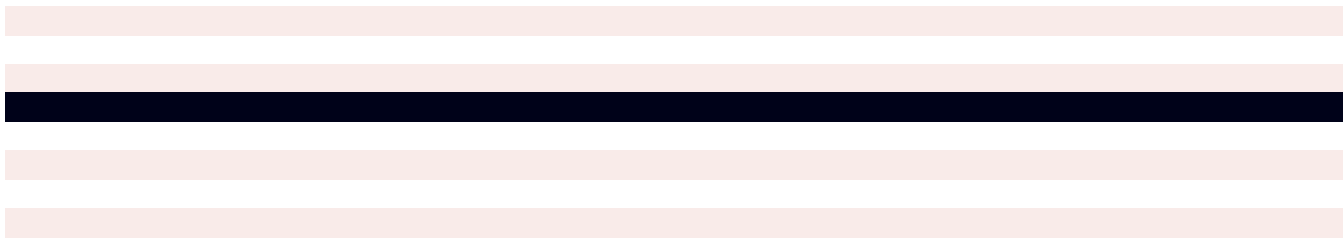
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	26 (0.5)	14 (2.)	518 (.0)	28 (3.5)	523 (6.1)	55 (4.4)	521 (8.2)	3 (1.7)	51 (7.5)
	20 (0.3)	41 (3.4)	517 (3.4)	52 (3.6)	51 (2.2)	6 (2.0)	518 (3.2)	1 (0.0)	/ /
	32 (0.3)	2 (0.7)	/ /	7 (2.0)	535 (12.0)	37 (4.0)	552 (3.0)	54 (3.7)	554 (2.3)
	23 (0.3)	18 (2.2)	476 (3.7)	55 (4.5)	484 (3.7)	26 (4.2)	478 (4.1)	1 (0.5)	/ /
	28 (0.8)	8 (2.8)	531 (22.6)	28 (4.5)	542 (6.1)	46 (5.2)	542 (5.8)	18 (4.3)	535 (10.1)
	34 (0.4)	1 (0.6)	/ /	2 (1.3)	/ /	31 (4.7)	532 (5.2)	66 (4.7)	54 (3.6)
	24 (0.5)	1 (3.2)	511 (7.6)	53 (4.1)	526 (4.6)	27 (4.1)	544 (6.1)	1 (0.)	/ /
	27 (0.6)	16 (2.6)	378 (11.6)	28 (3.7)	417 (5.)	27 (4.0)	411 (.0)	2 (4.0)	436 (6.5)
	20 (0.3)	45 (3.4)	521 (5.2)	53 (3.4)	511 (5.1)	1 (0.7)	/ /	0 (0.0)	/ /
	32 (0.3)	5 (1.1)	556 (6.4)	12 (2.3)	538 (4.8)	28 (3.0)	545 (2.5)	55 (2.8)	543 (2.2)
	21 (0.4)	30 (3.0)	4 4 (5.)	5 (3.5)	518 (2.4)	11 (2.5)	522 (6.0)	0 (0.3)	/ /
	24 (0.4)	20 (3.6)	4 1 (.0)	48 (4.7)	4 (5.8)	30 (3.8)	505 (10.1)	2 (1.3)	/ /
	23 (0.4)	24 (3.4)	530 (4.0)	41 (4.6)	522 (4.3)	33 (4.2)	52 (2.3)	2 (1.5)	/ /
	28 (0.3)	(1.4)	503 (11.5)	20 (2.3)	520 (7.5)	61 (3.2)	52 (3.0)	10 (2.6)	513 (8.4)
	21 (0.4)	38 (3.2)	464 (5.1)	47 (3.5)	466 (3.6)	13 (3.2)	476 (5.0)	2 (1.3)	/ /
	40 (1.0)	3 (1.0)	27 (3 .)	7 (2.4)	333 (31.6)	16 (3.8)	364 (38.8)	75 (4.2)	326 (.0)
	21 (0.3)	33 (3.2)	523 (7.2)	45 (3.6)	532 (8.6)	20 (2.5)	514 (8.7)	1 (0.)	/ /
	26 (0.5)	17 (3.6)	506 (721) 38.8)	0 3(0.5)-36) 3.4)2 (3.8)2		1 (2.4),6((1.4))-2847.6(64.344	-1. 4 345)-3-347		. 4 -1.5518





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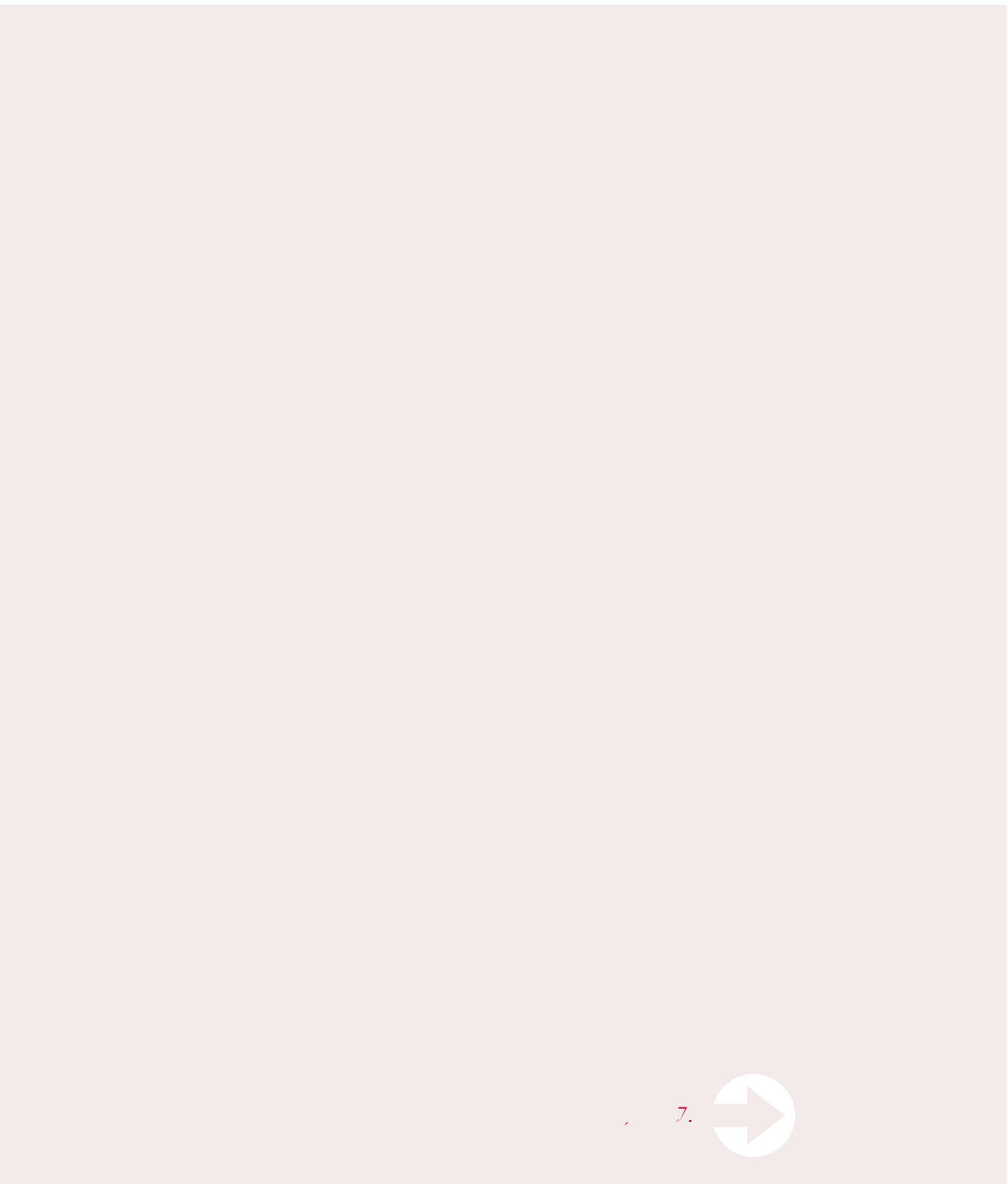
How Much School Time Is Devoted to Science Instruction?

Exhibit 7.3 presents information about the amount of science instruction given to students at the eighth and fourth grades. Since different systems have school years of different lengths and different arrangements of weekly and daily instruction, the comparisons are given in terms of the average number of hours of science instruction over the school year as reported by science teachers. At the eighth grade, results are presented first for countries teaching science as a single subject and then by science subject for countries teaching the sciences separately.

In general, students in countries with separate science subjects had more total instructional hours in the sciences. Since these students study all of the subjects offered, the total time is the sum of the hours reported by each subject area teacher. Based on these sums, instructional hours for students with separate science courses ranged from 120 hours in Latvia (where students took biology and physics only) to 284 hours in the Slovak Republic (where students took all four science subjects). Not surprisingly, the countries offering all four subjects were those with the most instructional time. All of these were from central or eastern Europe, and in addition to the Slovak Republic, included Bulgaria (245 hours), Estonia (259 hours), Hungary (235 hours), Lithuania (230 hours), Macedonia (255 hours), Romania (232 hours), and Serbia (223 hours). Among countries teaching science as a single subject, instructional time ranged from 69 hours in Italy to 202 in the Philippines, with an international average of 117 hours.

The percentage of instructional time at the eighth grade that was devoted to science ranged from 18 percent in the Philippines to 7 percent in Norway for single science countries. Among countries teaching separate science subjects, the percentage was between 6 and 7 percent for each subject. Combining these percentages gives a range from 13 percent for Latvia to 30 percent for the Slovak Republic.

At the fourth grade, countries devote less instructional time to science than at the eighth grade, in terms of both the total instructional





Countries

Students' Average Yearly Science Instructional Time in Hours

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7. Percentage of Time in Science Class Devoted to TIMSS Content Areas During the School Year



Countries	Life Science	Physical Science	Earth Science	Other
	42 (1.6)	21 (1.1)	31 (1.2)	7 (1.4)
	38 (1.1)	12 (0.)	34 (1.0)	17 (1.6)
	30 (0.)	34 (1.1)	33 (0.)	3 (0.7)
	35 (1.1)	4 (1.8)	15 (1.0)	2 (0.5)
	38 (1.5)	26 (1.4)	23 (1.2)	13 (1.)
	42 (1.1)	0 (0.7)	38 (1.4)	11 (1.5)
	35 (1.2)	21 (0.)	27 (0.8)	17 (1.1)
	56 (1.3)	18 (0.8)	22 (0.)	5 (0.7)
	36 (0.)	41 (1.0)	21 (0.)	2 (0.7)
	40 (1.4)	15 (0.7)	36 (1.2)	10 (1.0)
	42 (1.4)	15 (0.)	30 (1.3)	13 (1.2)
	56 (1.8)	15 (1.0)	24 (1.4)	4 (0.)
	35 (1.0)	27 (0.8)	2 (0.8)	1 (1.0)
	3 (1.4)	15 (0.6)	3 (1.2)	7 (1.5)
	40 (1.1)	24 (0.)	30 (0.)	6 (0.8)
	3 (1.5)	13 (0.)	35 (1.3)	13 (1.2)
	42 (1.4)	38 (1.6)	18 (1.0)	2 (0.6)
	45 (1.5)	21 (0.)	22 (0.)	12 (1.5)
	45 (0.)	3 (1.0)	11 (1.0)	5 (0.8)
	36 (0.8)	24 (0.8)	34 (1.0)	6 (0.8)
	41 (0.3)	24 (0.2)	28 (0.2)	8 (0.3)
Benchmarking Participants				
	42 (1.)	24 (1.4)	2 (1.5)	5 (2.1)
	31 (1.1)	32 (1.5)	2 (0.)	7 (0.)
	40 (1.6)	20 (1.7)	33 (1.8)	8 (1.)



At fourth grade, most students reported that they watch the teacher do a science experiment and write or give an explanation for something they are studying in science once or twice a month or more (69%, on average, for each activity). More than half the students (57%) reported working with other students in small groups on a science experiment or investigation, and 50 percent reported either designing or planning a science experiment or investigation or actually doing such an activity.

On average, internationally, teachers at both grade levels reported less emphasis on students watching them demonstrate an experiment or investigation than did the students. For example, at eighth grade in integrated science countries, teachers of only 38 percent of the students reported asking their students to watch them demonstrate an experiment or investigation in at least half the lessons, whereas 64 percent of student reported this activity at this frequency. Similarly at fourth grade, teachers of only 23 percent of students reported asking them to do this activity, while 69 percent of students reported doing so.

7. Students' Reports on Doing Science Investigations



Countries	Percentage of Students Who Reported Doing the Activity About Half of the Lessons or More					
	1995	2001	2003	2003	2003	2003
General/Integrated Science						
Algeria	54 (1.6)	4 (1.7)	60 (2.2)	68 (2.1)	75 (1.5)	42 (1.1)
Armenia	83 (0.8)	63 (0.8)	64 (0.8)	66 (1.1)	68 (0.)	64 (0.)
Australia	61 (0.)	45 (0.8)	48 (1.0)	50 (1.1)	61 (0.)	71 (0.8)
Austria	57 (1.3)	56 (1.4)	54 (1.5)	61 (1.4)	6 (1.0)	62 (0.7)
Azerbaijan	48 (1.1)	24 (0.)	36 (1.3)	37 (1.5)	37 (1.1)	40 (1.0)
Bahrain	80 (0.7)	61 (1.0)	62 (1.0)	60 (0.8)	71 (0.7)	73 (0.7)
Bangladesh	73 (1.2)	54 (1.3)	55 (1.3)	54 (1.5)	64 (1.5)	75 (1.0)
Belgium	66 (1.2)	35 (1.0)	71 (1.5)	75 (1.2)	67 (1.2)	61 (0.8)
Belize	87 (1.0)	66 (1.4)	77 (1.2)	73 (1.5)	78 (1.0)	70 (1.0)
Bolivia	73 (1.6)	56 (1.4)	63 (1.6)	52 (1.8)	76 (1.3)	56 (1.0)
Bosnia and Herzegovina	26 (1.3)	16 (0.)	13 (0.8)	12 (0.8)	32 (1.4)	35 (1.1)
Brazil	66 (1.5)	51 (1.7)	75 (1.7)	7 (1.6)	6 (1.5)	27 (1.1)
Bulgaria	67 (1.5)	56 (1.4)	55 (1.7)	53 (1.6)	66 (1.3)	70 (1.1)
Canada	31 (1.0)	14 (0.8)	20 (1.1)	3 (1.3)	44 (1.3)	36 (0.)
Chile	83 (1.1)	46 (1.3)	71 (1.7)	77 (1.3)	73 (1.0)	72 (1.0)
China	82 (1.2)	62 (1.3)	61 (1.2)	50 (1.3)	74 (1.0)	65 (1.2)
Croatia	60 (2.0)	50 (2.1)	56 (2.5)	66 (2.3)	73 (1.8)	45 (1.3)
Cuba	40 (1.5)	34 (1.6)	4 (2.2)	4 (2.2)	56 (1.)	31 (0.)
Czechia	70 (1.2)	56 (1.2)	57 (1.0)	54 (1.5)	66 (1.2)	6 (0.)
Denmark	74 (0.)	58 (1.2)	57 (1.0)	62 (1.1)	72 (1.0)	76 (0.8)
Egypt	68 (1.3)	50 (1.3)	51 (1.4)	43 (1.4)	60 (1.3)	67 (1.0)
Ecuador	6 (1.4)	54 (1.3)	74 (1.4)	81 (1.2)	83 (1.1)	47 (1.0)
Egypt	4 (0.)	31 (0.6)	55 (1.0)	57 (0.8)	68 (0.8)	58 (0.7)
Egypt	72 (1.1)	64 (1.2)	63 (1.1)	70 (1.1)	73 (0.7)	77 (0.7)
Egypt	7 (0.7)	65 (1.0)	6 (1.0)	55 (1.2)	73 (0.8)	54 (0.)
Egypt	57 (1.3)	48 (1.2)	55 (1.4)	65 (1.5)	65 (1.4)	51 (0.)
£	60 (1.)	54 (1.6)	63 (1.7)	71 (1.8)	71 (1.6)	35 (1.6)
£	64 (0.2)	4 (0.2)	57 (0.3)	5 (0.3)	66 (0.2)	57 (0.2)
Benchmarking Participants						
China	50 (2.2)	34 (1.8)	35 (2.2)	41 (2.3)	55 (1.)	51 (1.3)
China	5 (1.7)	4 (2.1)	56 (2.)	66 (2.7)	62 (2.6)	51 (1.6)
China	53 (1.6)	45 (1.6)	4 (1.8)	56 (2.0)	67 (1.5)	52 (1.4)
China	60 (1.5)	54 (1.6)	60 (2.0)	65 (1.)	62 (1.5)	45 (1.3)



Countries	Percentage of Students Who Reported Doing the Activity About Half of the Lessons or More					
	1. Always	2. Often	3. Sometimes	4. Not Often	5. Never	6. Don't Know

Chemistry						
Armenia	58 (1.7)	3 (1.4)	41 (1.6)	26 (1.4)	45 (1.4)	53 (1.3)
Australia	5 (2.0)	38 (1.6)	42 (1.)	25 (1.2)	37 (1.5)	35 (1.4)
Bahrain	82 (0.8)	71 (0.8)	73 (0.)	56 (1.0)	78 (0.8)	51 (0.)
Belgium	58 (2.0)	24 (1.3)	28 (1.7)	23 (1.6)	41 (1.7)	44 (1.4)
Brazil	77 (1.8)	66 (1.7)	67 (2.0)	14 (1.0)	68 (1.7)	58 (1.2)
Canada	43 (1.)	32 (1.5)	27 (1.5)	22 (1.2)	43 (1.5)	40 (1.2)
Chile	75 (1.2)	60 (1.4)	5 (1.5)	46 (1.6)	70 (1.2)	64 (1.3)
China	3 (1.)	27 (1.2)	26 (1.4)	16 (1.0)	33 (1.4)	34 (1.2)
Czechia	64 (1.8)	46 (1.7)	46 (1.8)	36 (1.8)	52 (1.5)	60 (1.4)
Denmark	70 (1.3)	47 (1.2)	4 (1.5)	34 (1.3)	48 (1.5)	53 (1.2)
Egypt	73 (1.3)	4 (1.5)	48 (1.6)	38 (1.6)	56 (1.5)	48 (1.3)
France	62 (1.2)	46 (1.3)	33 (1.5)	26 (1.4)	54 (1.3)	47 (1.6)
Germany	48 (2.2)	34 (1.7)	35 (1.)	25 (1.5)	46 (1.5)	50 (1.2)
Greece	76 (1.4)	44 (1.7)	38 (1.7)	36 (1.6)	60 (1.6)	43 (1.3)
India	70 (1.5)	50 (1.4)	56 (1.5)	31 (1.4)	52 (1.3)	42 (1.2)
Indonesia	5 (1.4)	47 (1.5)	60 (1.7)	56 (1.7)	57 (1.6)	28 (1.2)
Iran	63 (0.4)	45 (0.4)	45 (0.4)	32 (0.4)	52 (0.4)	47 (0.3)

Physics						
Armenia	62 (1.6)	40 (1.5)	44 (1.4)	28 (1.3)	47 (1.5)	62 (1.1)
Australia	53 (1.7)	34 (1.3)	36 (1.4)	25 (1.2)	34 (1.1)	45 (1.5)
Bahrain	7 (0.7)	70 (0.8)	71 (0.)	54 (1.2)	78 (0.7)	61 (0.8)
Belgium	45 (1.7)	23 (1.2)	27 (1.4)	24 (1.4)	3 (1.4)	53 (1.1)
Brazil	6 (1.5)	46 (1.2)	56 (1.7)	15 (0.)	58 (1.4)	58 (1.0)
Canada	63 (1.1)	24 (1.0)	24 (1.2)	2 (1.1)	46 (1.0)	40 (1.1)
Chile	37 (1.7)	25 (1.1)	24 (1.3)	20 (1.0)	3 (1.3)	50 (1.2)
China	74 (1.3)	55 (1.4)	55 (1.7)	46 (1.8)	68 (1.3)	65 (1.1)
Czechia	40 (2.1)	25 (1.3)	26 (1.4)	17 (0.8)	30 (1.3)	3 (1.2)
Denmark	56 (1.8)	3 (1.5)	3 (1.5)	38 (1.7)	4 (1.5)	63 (1.3)
Egypt	68 (1.4)	47 (1.3)	47 (1.4)	35 (1.4)	48 (1.2)	55 (1.0)
France	52 (2.0)	27 (1.5)	38 (2.1)	33 (2.0)	33 (1.8)	2 (1.3)
Germany	71 (1.5)	46 (1.6)	45 (1.7)	38 (1.6)	54 (1.5)	48 (1.3)
Greece	57 (1.4)	37 (1.3)	31 (1.3)	27 (0.)	4 (1.3)	51 (1.5)
India	37 (1.5)	23 (1.0)	25 (1.2)	1 (1.0)	3 (1.1)	4 (1.2)
Indonesia	68 (1.6)	34 (1.5)	30 (1.3)	30 (1.4)	51 (1.6)	45 (1.2)
Iran	57 (1.7)	3 (1.4)	43 (1.8)	26 (1.4)	46 (1.5)	43 (1.3)
Israel	51 (1.4)	41 (1.4)	52 (1.6)	50 (1.6)	48 (1.5)	32 (1.2)
Japan	58 (0.4)	38 (0.3)	40 (0.3)	31 (0.3)	47 (0.3)	4 (0.3)

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	67 (1.4)	3 (1.2)	37 (1.5)	40 (1.1)	61 (1.4)
	5 (1.)	44 (1.)	48 (1.8)	60 (2.1)	64 (1.)
	57 (1.8)	35 (1.5)	2 (1.4)	40 (1.7)	52 (1.6)
	2 (0.5)	4 (1.1)	61 (1.1)	76 (1.1)	77 (0.)
	3 (0.6)	81 (0.)	7 (1.0)	88 (0.)	88 (0.7)
	78 (1.7)	73 (1.5)	7 (1.3)	83 (1.3)	84 (0.)

7.6 Teachers' Reports on Students Doing Science Investigations (Continued...)



Countries	Percentage of Students Whose Teachers Reported Students Doing the Activity About Half of the Lessons or More					
	1999	2003	2006	2009	2012	2015

Biology

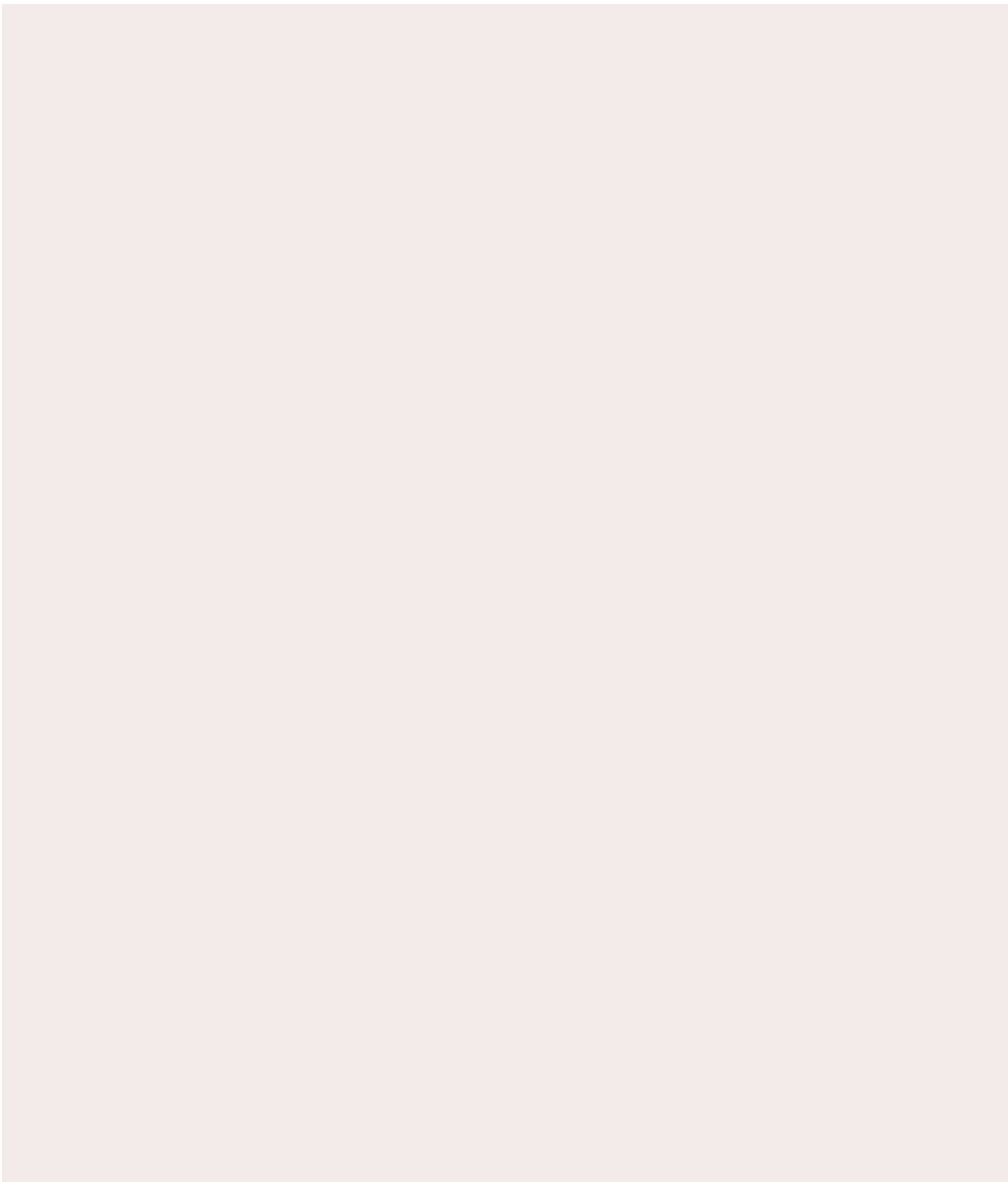
Algeria	14 (3.5)	15 (3.7)	23 (4.3)	15 (3.7)	14 (3.5)	87 (3.5)
Armenia	51 (3.)	1 (3.3)	33 (3.)	23 (3.2)	38 (3.7)	80 (2.)
Australia	42 (4.8)	4 (1.8)	5 (2.1)	16 (3.3)	12 (3.3)	87 (3.1)
Austria						
Bahrain	12 (3.5)	(3.4)	(3.4)	5 (1.8)	(2.8)	1 (2.6)
Belgium	12 (2.7)	4 (1.5)	4 (1.3)	6 (2.0)	16 (3.4)	88 (3.1)
Brazil	56 (4.6)	23 (4.0)	3 (3.)	34 (3.7)	54 (4.1)	63 (4.4)
Canada	1 (3.5)	8 (2.4)	14 (3.1)	26 (4.3)	36 (4.5)	84 (3.5)
Chile	11 (2.)	14 (3.5)	12 (2.8)	13 (2.7)	32 (4.7)	82 (3.2)
China	43 (3.)	25 (3.7)	28 (3.)	40 (4.6)	43 (4.5)	76 (3.7)
Czechia	(0.)	85 (6.3)	1 (4.7)	85 (5.)	8 (1.1)	(0.5)
Denmark	1 (1.4)	2 (1.4)	7 (2.1)	11 (3.3)	5 (2.4)	63 (5.4)
Egypt	41 (3.)	17 (3.3)	32 (3.8)	36 (4.3)	4 (4.4)	86 (3.0)
France	15 (2.6)	8 (2.0)	13 (2.6)	22 (3.1)	32 (3.5)	75 (3.4)
Germany	18 (3.2)	16 (3.1)	12 (2.)	15 (3.1)	26 (3.8)	83 (3.5)
Greece	18 (4.0)	8 (3.0)	8 (3.3)	16 (4.0)	27 (5.2)	81 (3.)
India	15 (3.2)	7 (2.1)	3 (1.4)	8 (2.3)	16 (3.4)	3 (2.3)
Indonesia	2 (0.)	16 (0.8)	21 (0.8)	23 (0.)	32 (0.)	82 (0.8)

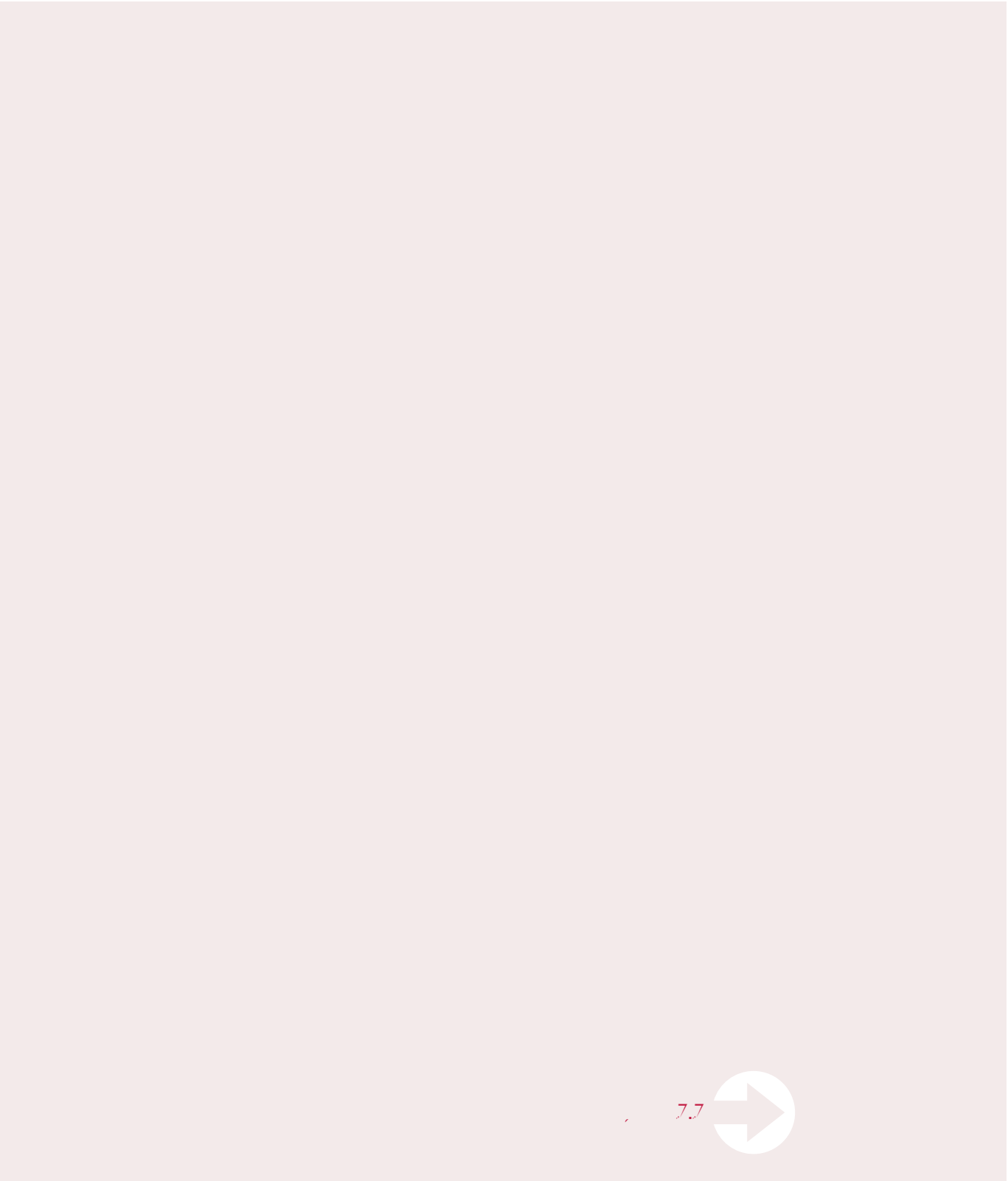
Earth Science

Algeria	11 (3.8)	8 (3.2)	13 (4.6)	20 (5.3)	21 (5.6)	7 (5.1)
Armenia	1 (2.6)	14 (2.6)	25 (3.3)	23 (3.3)	33 (3.5)	71 (3.6)
Australia	3 (5.1)	8 (2.7)	4 (1.8)	13 (3.2)	21 (4.2)	80 (4.3)
Austria						
Bahrain	3 (2.1)	25 (2.3)	22 (2.3)	23 (2.3)	46 (2.8)	82 (1.8)
Belgium	4 (2.1)	5 (1.)	3 (1.5)	3 (1.4)	12 (3.6)	87 (2.)
Brazil	10 (2.5)	4 (1.7)	2 (1.2)	8 (2.4)	21 (3.6)	80 (3.2)
Canada						
Chile	5 (2.1)	8 (2.7)	8 (2.6)	(2.7)	1 (3.3)	71 (4.1)
China	40 (4.8)	21 (3.7)	20 (3.7)	38 (4.4)	37 (4.6)	71 (4.1)
Czechia						
Denmark	1 (0.8)	4 (1.)	3 (1.8)	7 (2.7)	5 (2.3)	62 (4.)
Egypt	35 (4.5)	21 (3.7)	23 (3.6)	30 (3.6)	42 (4.4)	82 (3.3)
France	15 (2.8)	15 (4.6)	16 (4.4)	21 (3.0)	37 (3.)	75 (3.2)
Germany	16 (3.4)	11 (2.8)	10 (2.6)	16 (3.4)	24 (3.)	73 (4.4)
Greece	10 (3.2)	11 (4.4)	8 (2.7)	18 (4.2)	22 (4.6)	81 (3.7)
India						
Indonesia	1 (0.)	12 (0.)	12 (0.8)	18 (0.)	26 (1.1)	77 (1.1)









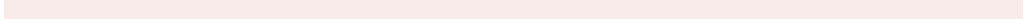
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	5 (1.1)	72 (2.6)	23 (2.5)
	1 (3.1)	31 (4.4)	50 (3.8)
	0 (0.0)	67 (2.6)	33 (2.6)
	14 (2.4)	43 (2.)	43 (2.4)
	5 (2.0)	25 (4.0)	70 (4.2)
	2 (0.5)	75 (2.3)	23 (2.3)
	6 (1.7)	21 (3.1)	74 (3.4)
	4 (1.7)	82 (3.4)	14 (3.2)
	2 (0.5)	62 (1.1)	36 (1.0)
	1 (0.6)	67 (4.0)	33 (4.1)
	0 (0.2)	80 (2.3)	20 (2.2)
	8 (2.5)	34 (4.5)	58 (4.7)
	1 (0.)	1 (2.8)	8 (2.6)
	0 (0.0)	66 (2.2)	34 (2.2)
	54 (4.7)	21 (3.)	24 (4.4)
	8 (2.0)	81 (2.)	12 (2.4)
	5 (1.7)	45 (4.0)	50 (3.7)
	1 (0.8)	63 (3.5)	36 (3.6)
	2 (1.0)	62 (3.)	37 (3.)
	0 (0.0)	68 (3.)	32 (3.)
	4 (1.4)	7 (2.)	18 (2.8)
	1 (0.7)	43 (2.3)	56 (2.4)
	5 (1.6)	4 (4.0)	46 (3.7)
	0 (0.0)	100 (0.0)	0 (0.0)
	5 (1.1)	63 (3.0)	32 (3.0)
	13 (2.7)	44 (3.)	43 (3.8)
	2 (0.8)	86 (2.0)	12 (2.0)
	0 (0.0)	12 (3.0)	88 (3.0)
	1 (0.6)	2 (1.)	7 (1.7)
	15 (4.0)	11 (3.2)	74 (5.0)
	0 (0.0)	87 (2.3)	13 (2.3)
	1 (0.0)	71 (3.8)	28 (3.7)
	8 (2.4)	52 (4.7)	41 (4.6)
	0 (0.2)	71 (2.3)	2 (2.3)
	0 (0.2)	67 (3.2)	33 (3.2)
	1 (0.0)	7 (4.6)	20 (4.6)
	10 (2.0)	30 (4.3)	61 (4.1)
	1 (0.5)	64 (2.2)	34 (2.3)
	0 (0.0)	73 (2.4)	27 (2.4)
	0 (0.3)	63 (2.6)	37 (2.7)
	1 (0.4)	5 (3.3)	41 (3.3)
	8 (2.3)	36 (3.3)	56 (3.5)
	3 (1.2)	40 (3.2)	58 (3.2)
	3 (1.4)	13 (2.8)	84 (3.1)
	7 (1.7)	3 (3.4)	54 (3.7)
	(2.7)	18 (3.)	72 (4.3)
	5 (0.2)	56 (0.5)	3 (0.5)
Benchmarking Participants			
	5 (1.8)	74 (4.8)	21 (4.5)
	2 (1.4)	48 (5.6)	50 (5.8)
	4 (2.1)	43 (4.4)	53 (4.7)
	11 (3.1)	38 (5.2)	51 (5.0)

2003

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7. Percentage of Time in Science Lessons Students Spend on Various Activities in a Typical Week

Countries	1. Listening to the teacher	2. Reading or looking at a book or article	3. Working on a project or assignment	4. Doing experiments or other hands-on activities
Algeria	10 (0.4)	18 (0.8)	18 (0.5)	14 (0.5)
Algeria (1999)	7 (0.4)	1 (1.3)	20 (0.7)	17 (0.)
Algeria (2001)	13 (0.4)	27 (0.)	13 (0.7)	10 (0.8)
Algeria (2002)	5 (0.3)	20 (1.2)	21 (0.)	12 (0.6)
Algeria (2003)	10 (0.4)	21 (1.3)	20 (1.0)	13 (1.0)
Algeria (2004)	8 (0.5)	27 (1.3)	16 (0.7)	11 (0.5)
Algeria (2005)	(0.4)	1 (0.)	1 (0.)	16 (0.8)
Algeria (2006)	(0.6)	50 (1.3)	10 (0.5)	5 (0.5)
Algeria (2007)	13 (0.2)	1 (0.4)	20 (0.2)	12 (0.3)
Algeria (2008)	12 (0.5)	20 (1.0)	15 (0.7)	12 (0.5)
Algeria (2009)	11 (0.3)	18 (0.6)	1 (0.5)	21 (0.5)
Algeria (2010)	10 (0.4)	17 (1.0)	18 (0.)	16 (0.7)
Algeria (2011)	8 (0.6)	35 (1.6)	17 (0.)	(0.6)
Algeria (2012)	8 (0.3)	24 (0.7)	21 (0.5)	16 (0.4)
Algeria (2013)	12 (0.4)	27 (1.1)	1 (0.7)	11 (0.7)
Algeria (2014)	10 (0.5)	20 (1.1)	15 (0.7)	12 (0.8)
Algeria (2015)	11 (0.4)	23 (1.0)	20 (0.8)	15 (0.8)
Algeria (2016)	12 (0.6)	31 (0.)	13 (0.6)	(0.4)
Algeria (2017)	3 (0.3)	41 (1.6)	16 (1.2)	6 (0.7)
Algeria (2018)	13 (0.7)	27 (1.1)	16 (0.6)	11 (0.6)
Algeria (2019)	5 (0.4)	47 (1.7)	11 (0.6)	10 (0.5)
Algeria (2020)	8 (0.3)	22 (1.0)	18 (0.5)	17 (0.7)
Algeria (2021)	16 (0.)	17 (1.0)	21 (0.)	8 (0.7)
Algeria (2022)	(0.3)	13 (0.6)	24 (0.6)	22 (0.5)
Algeria (2023)	7 (0.4)	37 (1.2)	1 (0.8)	13 (0.7)
Algeria (2024)	13 (0.7)	25 (1.2)	1 (0.8)	11 (0.7)
Algeria (2025)	13 (0.5)	17 (0.7)	1 (0.6)	16 (0.6)
Algeria (2026)	10 (0.5)	24 (1.7)	22 (1.7)	11 (0.6)
Algeria (2027)	16 (0.5)	1 (0.6)	16 (0.8)	1 (1.1)
Algeria (2028)	8 (0.5)	17 (1.0)	20 (0.8)	14 (1.0)
Algeria (2029)	7 (0.5)	24 (1.0)	21 (1.1)	20 (1.2)
Algeria (2030)	12 (0.7)	23 (1.2)	15 (0.6)	12 (0.6)
Algeria (2031)	(0.4)	22 (1.3)	16 (0.8)	13 (0.8)
Algeria (2032)	(0.3)	28 (0.6)	1 (0.5)	13 (0.4)
Algeria (2033)	13 (0.3)	28 (0.7)	15 (0.4)	14 (0.3)
Algeria (2034)	13 (0.)	21 (1.3)	13 (1.0)	8 (0.6)
Algeria (2035)	6 (0.3)	16 (0.8)	34 (1.3)	18 (1.2)
Algeria (2036)	6 (0.3)	41 (0.)	18 (0.7)	12 (0.4)
Algeria (2037)	12 (0.4)	36 (0.8)	14 (0.4)	11 (0.5)
Algeria (2038)	7 (0.3)	25 (0.7)	20 (0.7)	15 (0.3)
Algeria (2039)	7 (0.2)	2 (0.)	24 (0.6)	16 (0.6)
Algeria (2040)	11 (0.5)	15 (0.)	21 (0.)	18 (1.1)
Algeria (2041)	6 (0.4)	20 (0.8)	34 (1.3)	16 (1.0)
Algeria (2042)	11 (0.)	15 (1.2)	22 (1.2)	20 (1.3)
Algeria (2043)	(0.4)	20 (1.0)	18 (0.6)	17 (0.8)
Algeria (2044)	7 (0.4)	15 (0.)	32 (1.3)	1 (1.1)
Algeria (2045)	10 (0.1)	24 (0.2)	1 (0.1)	14 (0.1)
Benchmarking Participants				
Algeria (2046)	15 (0.6)	24 (1.4)	16 (1.0)	16 (0.)
Algeria (2047)	11 (0.)	20 (1.5)	1 (1.4)	16 (1.0)
Algeria (2048)	10 (0.5)	26 (1.6)	1 (1.0)	16 (1.0)
Algeria (2049)	7 (0.4)	30 (1.7)	17 (1.1)	12 (0.)

0 50% 100% 150% 200% 250% 300% 350% 400% 450% 500% 550% 600% 650% 700% 750% 800% 850% 900% 950% 1000%



How Are Computers Used in Science Class?

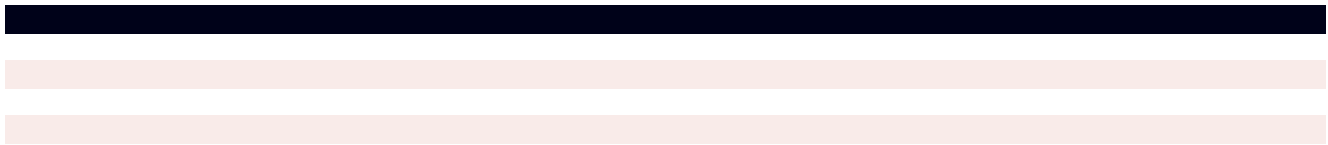
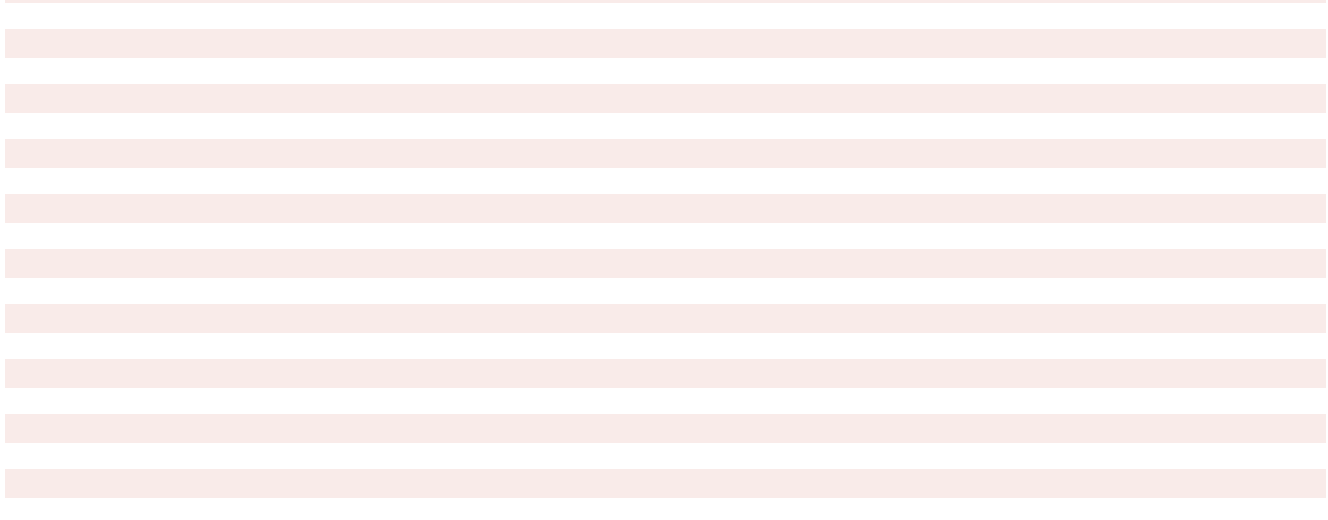
Exhibit 7.9 shows the number of countries with national policies on computer use, the percentages of students whose teachers reported that computers were not available, and the percentages of students using computers for various activities in about half of the lessons or more. Across countries, 25 participants at the eighth grade and 12 at the fourth grade reported that their science curriculum contained statements about computer use and yet access to computers remains a challenge in many countries. Teachers reported that, on average, internationally, computers were not available for 62 percent of the eighth-grade students and 54 percent of the fourth-grade students. Beyond that, using computers as often as in half the lessons was extremely rare at either grade, even in countries with relatively high availability. Korea was the only country where a substantial percentage of students used a computer regularly for doing scientific procedures or experiments (32%) or studying natural phenomena through simulations (28%).



) 2003



	○	77 (2.8)	2 (0.7)	2 (0.7)	3 (1.0)	5 (1.3)	3 (0.)
	●	26 (3.7)	1 (0.7)	0 (0.2)	3 (1.2)	6 (1.7)	4 (1.3)
	●	44 (3.6)	3 (1.2)	3 (1.4)	10 (2.1)	22 (2.8)	7 (1.8)
	○	66 (3.4)	1 (0.5)	0 (0.3)	1 (0.4)	1 (0.4)	1 (0.4)
	○	5 (2.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.3)
	○	85 (2.2)	0 (0.2)	0 (0.1)	1 (0.5)	2 (0.5)	0 (0.0)
	○	40 (3.5)	2 (0.6)	5 (2.0)	6 (1.3)	26 (2.)	12 (2.4)
	●	56 (4.0)	1 (0.7)	1 (0.7)	2 (0.7)	1 (1.0)	1 (1.0)
	●	81 (0.8)	1 (0.1)	0 (0.1)	1 (0.1)	3 (0.4)	2 (0.1)
	●						
	●	56 (2.8)	2 (0.7)	1 (0.4)	1 (0.5)	4 (0.7)	2 (0.5)
	●	1 (2.)	2 (1.3)	3 (1.5)	1 (0.0)	3 (1.5)	1 (1.0)
	●	44 (4.6)	5 (2.0)	3 (1.5)	4 (1.)	5 (1.7)	3 (1.5)
	●	5 (2.)	1 (0.4)	1 (0.4)	1 (0.5)	2 (0.8)	1 (0.5)
	○	86 (2.5)	1 (0.8)	1 (0.8)	2 (1.0)	3 (1.1)	2 (1.1)
	○	8 (0.8)	0 (0.0)	0 (0.0)	1 (0.5)	1 (0.5)	1 (0.5)
	●	4 (4.1)	3 (1.4)	2 (1.1)	5 (1.4)	(1.)	7 (1.)
	○	65 (3.7)	0 (0.0)	1 (0.8)	1 (0.7)	6 (1.6)	4 (1.4)
	●	20 (3.4)	1 (0.)	3 (1.3)	2 (0.6)	3 (1.4)	1 (0.)
	●	82 (3.5)	1 (1.0)	3 (2.2)	3 (2.2)	4 (2.0)	2 (1.1)
	●	14 (2.6)	32 (3.4)	28 (2.)	11 (2.2)	16 (2.8)	12 (2.1)
	○	70 (2.6)	1 (0.6)	1 (0.7)	1 (0.6)	4 (1.3)	2 (0.)
	○	83 (2.4)	3 (1.0)	2 (0.)	4 (1.4)	(1.)	7 (1.6)
	●	28 (2.7)	1 (0.3)	2 (0.7)	7 (1.4)	12 (1.3)	6 (1.1)
	○	3 (1.6)	0 (0.2)	1 (0.3)	1 (0.4)	1 (0.4)	1 (0.4)
	○	86 (3.0)	3 (1.4)	1 (0.)	1 (0.7)	3 (1.3)	2 (1.3)



79 Computer Use in Science Class



Countries	National Curriculum Contains Policies / Statements About the Use of Computers	Percentage of Students Whose Teachers Reported That Computers Are Not Available	Percentage of Students Whose Teachers Reported on Computer Use About Half of the Lessons or More			
			Less than 10%	10% to 25%	25% to 50%	50% or more
	○					
	●	16 (3.0)	4 (1.8)	5 (2.4)	6 (2.5)	23 (3.8)
	○	37 (3.7)	2 (0.)	1 (0.7)	4 (1.4)	12 (2.3)
	●	65 (4.0)	3 (1.3)	3 (1.5)	4 (1.6)	8 (2.4)
	○	26 (4.3)	2 (1.1)	4 (1.5)	3 (1.6)	11 (2.2)
	●	12 (2.8)	4 (2.0)	3 (1.)	4 (2.0)	15 (2.8)
	●	36 (4.8)	1 (0.8)	4 (1.)	2 (1.4)	8 (2.2)
	○	76 (4.0)	1 (0.8)	1 (0.8)	1 (0.)	1 (0.)
	○	6 (1.8)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.)
	○	81 (2.7)	0 (0.0)	0 (0.0)	0 (0.0)	2 (1.1)
	●	11 (2.8)	1 (0.0)	(2.5)	1 (1.0)	8 (2.4)
	○					
	●	1 (2.2)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.6)
	○	78 (4.0)	0 (0.0)	0 (0.0)	4 (1.8)	4 (1.8)
	○					
	○	62 (4.)	1 (0.0)	0 (0.0)	2 (1.4)	4 (2.0)
	○	15 (2.6)	2 (1.2)	5 (1.4)	5 (1.7)	34 (3.3)
	●	46 (4.2)	0 (0.0)	0 (0.0)	0 (0.0)	3 (2.2)
	○	4 (2.4)	1 (1.1)	2 (1.4)	3 (2.0)	3 (1.)
	○	7 (1.3)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.5)
	●	21 (4.3)	1 (1.0)	0 (0.0)	4 (1.8)	1 (4.1)
	●	23 (3.5)	5 (1.8)	4 (1.7)	10 (2.7)	14 (2.)
	○	77 (3.)	1 (0.)	0 (0.0)	0 (0.0)	1 (0.5)
	○	85 (3.4)	4 (1.7)	4 (1.7)	5 (2.0)	8 (2.5)
	○	32 (2.5)	3 (1.0)	2 (0.8)	6 (1.1)	1 (2.3)
		54 (0.7)	2 (0.2)	2 (0.3)	3 (0.3)	(0.5)
Benchmarking Participants						
	●	32 (4.7)	2 (1.4)	1 (0.0)	3 (1.1)	17 (3.)
	●	38 (4.5)	5 (3.0)	3 (1.8)	3 (1.7)	10 (2.)
	●	46 (4.5)	1 (1.3)	1 (0.6)	(2.6)	23 (4.2)

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What Are the Roles of Homework and Assessment?

The amount of time students spend on homework assignments is an important consideration in examining their opportunity to learn science. Exhibit 7.10 presents the index of teachers' emphasis on science homework. Students in the high category had teachers who reported giving relatively long homework assignments (more than 30 minutes) on a relatively frequent basis (in about half the lessons or more). Those in the low category had teachers who gave short assignments (less than 30 minutes) relatively infrequently (in about half the lessons or less). The medium level includes all other possible combinations of responses.

The results show considerable variation across countries in the emphasis placed on homework. At the eighth grade, more than 40 percent of the students in Italy and Malaysia were in the high category. For the majority of countries, most students were in the medium (41%, on average) and low (44%, on average) categories. Seventy percent or more of the students were in the low category in Serbia, Tunisia, Bulgaria, Slovenia, Korea, Scotland, Japan, Belgium (Flemish), and the Slovak Republic. It can be noted, however, that students in Japan and perhaps Korea may be more likely to spend extra time in tutoring and special schools than doing homework.¹ At the fourth grade, teachers reported giving science homework much less frequently than at eighth grade. On average, internationally, only 6 percent of the fourth-grade students were in the high category. About one-fourth were in the medium category and almost 70 percent were in the low category. Students in the high category at both grade levels had the lowest science achievement, on average, suggesting that homework often was being used for remedial purposes.

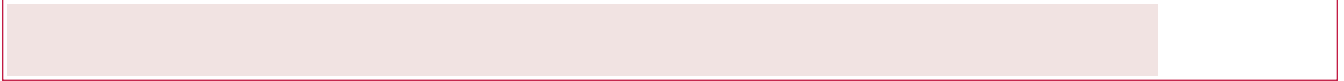
Exhibit 7.11 presents eighth-grade teachers' reports about how they usually use homework in their science instruction. Internationally, the eighth-grade science teachers reported always or almost always monitoring whether homework was completed (for 76 percent of the students, on average). For more than half (62%) of the eighth-grade

¹ TIMSS & PIRLS (1997), *National Contexts for Mathematics and Science Education: An Encyclopedia of the Education Systems Participating in TIMSS*, pp. 100-101.

students, on average, teachers reported always or almost always correcting assignments and giving feedback to students, but for about one-fourth, on average, the students corrected their own homework in class. One-fourth of the students, on average, had teachers that reported using homework as basis for class discussion and almost one-third to contribute toward grades or marks (31%).

As shown in Exhibit 7.12, eighth-grade teachers reported substantial variation across countries in the frequency of testing in science class. On average, internationally, about one-third of the students (32%) reported having a science test or examination every two weeks or more and another 43 percent reported such testing about once a month. Testing every two weeks or more for most students (80% or more) was reported by eighth-grade teachers in Bahrain, Chinese Taipei, Egypt, and the Philippines. Even though the international average was relatively low (25%) for infrequent testing, there were countries where teachers reported testing only a few times a year or more for half or more of the eighth-grade students, including Bulgaria, Hong Kong SAR, Israel, Japan, Norway, Serbia, Slovenia, and Sweden.

Exhibit 7.13 presents eighth-grade teachers' reports about the types of test formats they use for science tests in relation to average science achievement. On average, internationally, more than half the eighth-grade students (60%) had teachers who used constructed-response and multiple-choice formats for their tests or examinations in about equal proportions. More than one-fourth (28%) had teachers who used only or mostly constructed-response science tests. Very few students (13%, on average) had teachers who reported using only or mostly multiple-choice testing. These students had lower science achievement, on average, than did students whose teachers used some constructed-response and multiple-choice items or only constructed-response items.



7.11 Use of Science Homework

Countries	Percentage of Students Whose Teachers Always or Almost Always				
	Never	Almost Never	Some of the Time	Most of the Time	Always
Algeria	2 (1.2)	87 (1.7)	44 (2.2)	33 (2.6)	27 (2.2)
Algeria (1)	72 (3.4)	61 (3.)	12 (2.8)	14 (2.7)	30 (3.)
Algeria (2)	85 (3.1)	8 (2.7)	26 (2.7)	26 (3.2)	75 (3.1)
Algeria (3)	62 (2.)	56 (3.1)	15 (2.5)	12 (1.8)	31 (2.7)
Algeria (4)	2 (2.7)	88 (3.2)	1 (3.4)	21 (3.5)	(2.6)
Algeria (5)	85 (2.0)	61 (2.5)	(1.5)	17 (2.1)	7 (1.4)
Algeria (6)	85 (2.6)	83 (2.8)	57 (3.7)	50 (4.0)	35 (4.0)
Algeria (7)	5 (4.1)	42 (4.4)	2 (3.6)	30 (3.)	51 (4.5)
Algeria (8)	85 (0.8)	73 (1.2)	17 (0.7)	32 (1.2)	48 (1.3)
Algeria (9)	87 (2.7)	85 (3.3)	24 (3.5)	48 (4.6)	27 (3.8)
Algeria (10)	71 (2.2)	35 (2.2)	10 (1.5)	24 (2.3)	30 (2.6)
Algeria (11)	5 (1.8)	3 (2.3)	35 (4.7)	36 (4.4)	63 (4.)
Algeria (12)	72 (4.1)	58 (4.2)	22 (3.)	12 (2.7)	20 (3.2)
Algeria (13)	88 (1.7)	40 (2.3)	54 (2.6)	8 (1.5)	8 (1.2)
Algeria (14)	3 (1.)	87 (2.0)	16 (2.6)	22 (2.8)	4 (3.3)
Algeria (15)	52 (4.2)	35 (4.1)	32 (3.6)	18 (2.7)	41 (3.7)
Algeria (16)	78 (2.)	67 (3.4)	58 (4.1)	38 (4.0)	60 (3.2)
Algeria (17)	77 (3.1)	35 (3.6)	37 (3.6)	42 (3.4)	13 (2.7)
Algeria (18)	48 (3.)	22 (3.5)	22 (3.5)	(2.3)	28 (3.6)
Algeria (19)	0 (2.5)	7 (3.8)	55 (4.2)	42 (4.6)	41 (4.2)
Algeria (20)	52 (4.0)	14 (2.7)	13 (2.3)	7 (1.)	26 (2.8)
Algeria (21)	71 (2.4)	53 (3.2)	13 (1.6)	11 (1.)	14 (1.)
Algeria (22)	80 (3.2)	87 (2.6)	52 (3.7)	40 (3.1)	13 (2.5)
Algeria (23)	64 (2.3)	57 (2.4)	14 (1.6)	8 (1.2)	15 (1.8)
Algeria (24)	65 (2.6)	5 (2.6)	24 (2.6)	1 (1.8)	25 (2.3)
Algeria (25)	2 (2.2)	87 (2.6)	5 (1.)	2 (3.7)	6 (2.2)
Algeria (26)	7 (2.8)	48 (3.2)	40 (3.1)	44 (2.6)	45 (2.7)
Algeria (27)	61 (4.6)	75 (4.1)	58 (5.0)	22 (3.8)	42 (4.7)
Algeria (28)	41 (3.2)	42 (3.1)	55 (2.)	7 (1.5)	11 (2.2)
Algeria (29)	80 (4.5)	60 (4.4)	15 (3.3)	(1.)	1 (3.8)
Algeria (30)	22 (3.5)	7 (2.2)	7 (2.5)	18 (3.5)	27 (4.1)
Algeria (31)	2 (2.3)	87 (3.0)	56 (4.7)	44 (4.4)	48 (4.2)
Algeria (32)	87 (3.3)	81 (4.1)	26 (4.4)	52 (4.0)	57 (4.4)
Algeria (33)	81 (1.8)	60 (2.1)	15 (1.6)	26 (1.8)	10 (1.7)
Algeria (34)	1 (1.1)	66 (2.3)	23 (1.5)	10 (0.)	48 (1.)
Algeria (35)	1 (2.)	85 (3.)	45 (5.1)	24 (5.8)	72 (4.8)
Algeria (36)	4 (1.5)	85 (2.1)	2 (0.)	13 (2.0)	12 (2.3)
Algeria (37)	60 (2.6)	45 (2.6)	1 (1.)	20 (2.0)	10 (1.4)
Algeria (38)	87 (1.8)	75 (2.0)	17 (1.)	3 (2.6)	12 (1.5)
Algeria (39)	76 (2.2)	57 (2.5)	7 (1.5)	15 (1.8)	14 (1.6)
Algeria (40)	63 (2.6)	26 (2.7)	28 (2.3)	15 (2.0)	5 (1.3)
Algeria (41)	88 (2.6)	83 (2.5)	26 (2.)	32 (3.)	33 (3.3)
Algeria (42)	52 (3.1)	38 (3.0)	4 (1.4)	22 (2.6)	20 (2.7)
Algeria (43)	68 (3.7)	52 (3.7)	46 (3.7)	22 (3.4)	10 (2.4)
Algeria (44)	87 (2.0)	5 (3.1)	22 (2.6)	3 (3.3)	72 (2.)
#	2 (2.5)	85 (2.4)	3 (1.6)	11 (2.8)	43 (4.7)
Algeria (45)	76 (0.4)	62 (0.4)	27 (0.4)	25 (0.4)	31 (0.5)
Benchmarking Participants					
Algeria (46)	86 (3.8)	60 (5.2)	72 (5.2)	26 (4.)	70 (5.1)
Algeria (47)	0 (3.)	63 (6.6)	20 (5.4)	36 (5.)	75 (5.1)
Algeria (48)	82 (3.8)	62 (4.7)	22 (3.)	31 (4.0)	4 (4.)
Algeria (49)	64 (4.7)	67 (4.2)	41 (5.3)	16 (3.5)	12 (2.5)





	13 (1.4)	48 (2.4)	40 (2.4)
	7 (1.)	64 (3.6)	28 (3.1)
	83 (2.2)	17 (2.2)	0 (0.0)
	43 (3.7)	4 (3.5)	8 (1.8)
	11 (2.8)	88 (3.0)	1 (0.0)
	8 (1.6)	40 (3.0)	51 (3.2)
	45 (4.0)	47 (4.1)	7 (2.1)
	7 (1.4)	3 (1.4)	0 (0.0)
	3 (0.6)	48 (1.3)	4 (1.4)
	8 (2.5)	11 (2.5)	0 (0.0)
	50 (2.6)	46 (2.4)	4 (0.)
	74 (3.7)	24 (3.8)	2 (1.2)
	20 (3.1)	28 (4.0)	52 (3.8)
	38 (2.8)	51 (2.7)	11 (1.6)
	36 (3.2)	52 (3.6)	12 (2.4)
	48 (4.1)	45 (4.0)	7 (2.2)
	(2.0)	27 (3.2)	64 (3.2)
	17 (2.)	52 (3.7)	30 (3.1)
	11 (2.7)	35 (3.7)	54 (4.1)
	33 (4.3)	51 (4.5)	16 (3.8)
	4 (4.3)	34 (4.1)	17 (3.3)
	43 (3.2)	54 (2.)	3 (1.0)
	23 (2.0)	66 (2.2)	11 (1.6)
	2 (2.2)	27 (2.4)	44 (2.8)
	7 (2.0)	44 (4.1)	4 (3.)
	43 (3.6)	43 (3.4)	14 (1.)
	34 (5.1)	61 (5.7)	5 (2.1)
	25 (2.6)	6 (2.7)	6 (1.5)
	10 (2.)	7 (4.5)	11 (3.7)
	2 (1.4)	42 (4.8)	56 (4.)
	2 (4.3)	33 (3.6)	38 (4.6)
	2 (2.6)	5 (2.1)	3 (1.5)
	44 (2.5)	50 (2.5)	6 (1.1)
	60 (2.4)	30 (2.3)	(1.3)
	3 (5.1)	42 (5.6)	1 (3.4)
	3 (1.2)	58 (3.)	38 (3.)
	3 (0.7)	18 (1.5)	7 (1.8)
	25 (2.1)	61 (2.8)	15 (2.0)
	24 (2.5)	38 (2.3)	38 (2.8)
	0 (0.0)	7 (1.5)	3 (1.5)
	23 (3.6)	65 (4.2)	12 (2.2)
	2 (1.1)	36 (3.2)	62 (3.3)
	(2.1)	73 (3.3)	18 (3.1)
	67 (3.4)	27 (3.3)	6 (1.5)
	15 (3.7)	57 (4.7)	28 (4.5)
	32 (0.4)	43 (0.5)	25 (0.4)
Benchmarking Participants			
	33 (4.8)	58 (4.8)	(2.8)
	72 (4.7)	26 (4.)	1 (1.0)

