

TIMSS 2011

Number of Items in the Mathematics and Science Assessments

Distribution of TIMSS 2011 Items by Content and Cognitive Domains

In developing the specification for the new items to be developed for TIMSS 2011, consideration was given to the pool of trend items that already existed and were to be used in TIMSS 2011 (trend items are items previously used in TIMSS 2003 or 2007 and retained for use in 2011 as a basis for measuring trends). The mathematics and science trend items were mapped onto the content and cognitive domains described in the *TIMSS 2011 Assessment Frameworks*, and new items were written to complement the existing trend item pool.

The exhibits present the number of items as well as the number of score points in the TIMSS 2011 Mathematics and Science Assessments. The number of items represents the number of distinct questions in the assessment, while the number of score points represents the complexity and weight given to each item. Each multiple-choice question is worth one score point. Constructed-response questions generally are worth one or two score points depending on the degree of complexity involved. The 1-point constructed-response items are scored as correct (1 score point) or incorrect (0 score points), whereas 2-point constructed-response items are scored as fully correct (2 score points), partially correct (1 score point), or incorrect (0 score points). Fully correct responses show a complete or deeper understanding of a task while partially correct responses demonstrate only a partial understanding of the concepts or procedures embodied in the task.

Fourth Grade TIMSS 2011 Assessment Items by Content Domain

Content Domain	Number of Trend Items in TIMSS 2011	Percentage of Trend Score Points	Number of New Items in TIMSS 2011	Percentage of New Score Points	Total Items	Achieved Percentage of Score Points	Target Percentage of Score Points
Mathematics Items							
Number	52 (55)	50%	36 (37)	50%	88 (92)	50%	50%
Geometric Shapes and Measures	36 (40)	36%	25 (25)	34%	61 (65)	35%	35%
Data Display	15 (16)	14%	11 (12)	16%	26 (28)	15%	15%
Total	103 (111)		72 (74)		175 (185)		
Science Items							
Life Science	42 (48)	43%	33 (34)	47%	75 (82)	45%	45%
Physical Science	38 (39)	35%	25 (25)	34%	63 (64)	35%	35%
Earth Science	20 (24)	22%	14 (14)	19%	34 (38)	21%	20%
Total	100 (111)		72 (73)		172 (184)		

Score points are shown in parentheses.

Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Fourth Grade TIMSS 2011 Assessment Items by Cognitive Domain

Cognitive Domain	Number of Trend Items in TIMSS 2011	Percentage of Trend Score Points	Number of New Items in TIMSS 2011	Percentage of New Score Points	Total Items	Achieved Percentage of Score Points	Target Percentage of Score Points
Mathematics Items							
Knowing	44 (47)	42%	26 (26)	35%	70 (73)	39%	40%
Applying	40 (43)	39%	31 (32)	43%	71 (75)	41%	40%
Reasoning	19 (21)	19%	15 (16)	22%	34 (37)	20%	20%
Total	103 (111)		72 (74)		175 (185)		
Science Items							
Knowing	41 (47)	42%	28 (29)	40%	69 (76)	41%	40%
Applying	40 (44)	40%	31 (31)	42%	71 (75)	41%	40%
Reasoning	19 (20)	18%	13 (13)	18%	32 (33)	18%	20%
Total	100 (111)		72 (73)		172 (184)		

Score points are shown in parentheses.

Eighth Grade TIMSS 2011 Assessment Items by Content Domain

Content Domain	Number of Trend Items in TIMSS 2011	Percentage of Trend Score Points	Number of New Items in TIMSS 2011	Percentage of New Score Points	Total Items	Achieved Percentage of Score Points	Target Percentage of Score Points
Mathematics Items							
Number	30 (34)	25%	31 (33)	35%	61 (67)	29%	30%
Algebra	47 (51)	37%	23 (25)	26%	70 (76)	33%	30%
Geometry	25 (26)	19%	18 (18)	19%	43 (44)	19%	20%
Data and Chance	24 (26)	19%	19 (19)	20%	43 (45)	19%	20%
Total	126 (137)		91 (95)		217 (232)		
Science Items							
Biology	46 (51)	37%	33 (36)	37%	79 (87)	37%	35%
Chemistry	25 (27)	20%	19 (20)	21%	44 (47)	20%	20%
Physics	33 (36)	26%	22 (22)	23%	55 (58)	25%	25%
Earth Science	21 (23)	17%	18 (19)	20%	39 (42)	18%	20%
Total	125 (137)		92 (97)		217 (234)		

Score points are shown in parentheses.

Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Eighth Grade TIMSS 2011 Assessment Items by Cognitive Domain

Cognitive Domain	Number of Trend Items in TIMSS 2011	Percentage of Trend Score Points	Number of New Items in TIMSS 2011	Percentage of New Score Points	Total Items	Achieved Percentage of Score Points	Target Percentage of Score Points
Mathematics Items							
Knowing	53 (55)	40%	27 (28)	29%	80 (83)	36%	35%
Applying	43 (47)	34%	42 (44)	46%	85 (91)	39%	40%
Reasoning	30 (35)	26%	22 (23)	24%	52 (58)	25%	25%
Total	126 (137)		91 (95)		217 (232)		
Science Items							
Knowing	43 (45)	33%	30 (31)	32%	73 (76)	32%	35%
Applying	58 (67)	49%	34 (36)	37%	92 (103)	44%	35%
Reasoning	24 (25)	18%	28 (30)	31%	52 (55)	24%	30%
Total	125 (137)		92 (97)		217 (234)		

Score points are shown in parentheses.

Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Distribution of TIMSS 2011 Items by Content and Cognitive Domains and Item Format

The following exhibits display the number of items (and score points) for each content and cognitive domain by item format. TIMSS 2011 includes multiple-choice items where the student chooses the correct answer from four response options, and constructed-response items where the student is required to provide a written response. As described in the TIMSS 2011 Assessment Frameworks, the goal was that at least half of the total number of score points represented by all the questions should come from multiple-choice questions. The exhibits show that, for the most part, the TIMSS 2011 targets for item format were achieved.

Fourth Grade TIMSS 2011 Assessment Items by Content Domain and Item Format

Content Domain	Multiple-choice Items	Constructed-response Items	Total Items
Mathematics Items			
Number	42 (42)	46 (50)	88 (92)
Geometric Shapes and Measures	38 (38)	23 (27)	61 (65)
Data Display	13 (13)	13 (15)	26 (28)
Total	93 (93)	82 (92)	175 (185)
Achieved Percentage of Score Points	50%	50%	
Target Percentage of Score Points	50%	50%	
Science Items			
Life Science	36 (36)	39 (46)	75 (82)
Physical Science	37 (37)	26 (27)	63 (64)
Earth Science	20 (20)	14 (18)	34 (38)
Total	93 (93)	79 (91)	172 (184)
Achieved Percentage of Score Points	51%	49%	
Target Percentage of Score Points	50%	50%	

Score points are shown in parentheses.

Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Fourth Grade TIMSS 2011 Assessment Items by Cognitive Domain and Item Format

Cognitive Domain	Multiple-choice Items	Constructed-response Items	Total Items
Mathematics Items			
Knowing	43 (43)	27 (30)	70 (73)
Applying	34 (34)	37 (41)	71 (75)
Reasoning	16 (16)	18 (21)	34 (37)
Total	93 (93)	82 (92)	175 (185)
Achieved Percentage of Score Points	50%	50%	
Target Percentage of Score Points	50%	50%	
Science Items			
Knowing	42 (42)	27 (34)	69 (76)
Applying	38 (38)	33 (37)	71 (75)
Reasoning	13 (13)	19 (20)	32 (33)
Total	93 (93)	79 (91)	172 (184)
Achieved Percentage of Score Points	51%	49%	
Target Percentage of Score Points	50%	50%	

Score points are shown in parentheses.

Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Eighth Grade TIMSS 2011 Assessment Items by Content Domain and Item Format

Content Domain	Multiple-choice Items	Constructed-response Items	Total Items
Mathematics Items			
Number	31 (31)	30 (36)	61 (67)
Algebra	37 (37)	33 (39)	70 (76)
Geometry	25 (25)	18 (19)	43 (44)
Data and Chance	25 (25)	18 (20)	43 (45)
Total	118 (118)	99 (114)	217 (232)
Achieved Percentage of Score Points	51%	49%	
Target Percentage of Score Points	50%	50%	
Science Items			
Biology	38 (38)	41 (49)	79 (87)
Chemistry	22 (22)	22 (25)	44 (47)
Physics	29 (29)	26 (29)	55 (58)
Earth Science	21 (21)	18 (21)	39 (42)
Total	110 (110)	107 (124)	217 (234)
Achieved Percentage of Score Points	47%	53%	
Target Percentage of Score Points	50%	50%	

Score points are shown in parentheses.

Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Eighth Grade TIMSS 2011 Items by Cognitive Domain and Item Format

Cognitive Domain	Multiple-choice Items	Constructed-response Items	Total Items
Mathematics Items			
Knowing	53 (53)	27 (30)	80 (83)
Applying	47 (47)	38 (44)	85 (91)
Reasoning	18 (18)	34 (40)	52 (58)
Total	118 (118)	99 (114)	217 (232)
Achieved Percentage of Score Points	51%	49%	
Target Percentage of Score Points	50%	50%	
Science Items			
Knowing	58 (58)	15 (18)	73 (76)
Applying	40 (40)	52 (63)	92 (103)
Reasoning	12 (12)	40 (43)	52 (55)
Total	110 (110)	107 (124)	217 (234)
Achieved Percentage of Score Points	47%	53%	
Target Percentage of Score Points	50%	50%	

Score points are shown in parentheses.

Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Number of Score Points in Each TIMSS 2011 Booklet by Content Domain – Fourth Grade

Content Domain	Booklet													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Mathematics														
Number	14	12	13	14	15	16	14	13	13	12	12	11	11	14
Geometric Shapes and Measures	6	12	12	7	9	10	9	10	9	8	8	12	12	6
Data Display	2	4	4	4	4	3	3	5	5	6	6	4	4	2
Total	22	28	29	25	28	29	26	28	27	26	26	27	27	22
Science														
Life Science	11	13	13	9	9	9	10	14	15	13	11	12	13	12
Physical Science	10	9	8	8	10	11	9	9	9	9	9	9	9	9
Earth Science	4	5	6	6	6	6	5	5	5	6	7	6	5	4
Total	25	27	27	23	25	26	24	28	29	28	27	27	27	25
Total Overall	47	55	56	48	53	55	50	56	56	54	53	54	54	47

Number of Score Points in Each TIMSS 2011 Booklet by Content Domain – Eighth Grade

Content Domain	Booklet													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Mathematics														
Number	8	10	10	8	7	5	7	11	12	11	9	14	14	8
Algebra	13	10	10	7	9	13	11	12	12	10	10	10	11	14
Geometry	6	7	6	9	9	7	6	5	6	6	6	5	5	5
Data and Chance	4	8	8	6	7	8	7	5	5	7	8	7	6	4
Total	31	35	34	30	32	33	31	33	35	34	33	36	36	31
Science														
Biology	10	11	12	14	14	12	12	12	13	13	12	14	14	11
Chemistry	6	8	7	5	8	8	5	6	7	9	8	6	6	5
Physics	9	11	11	6	8	9	6	8	8	6	7	9	9	9
Earth Science	7	5	5	6	5	6	7	6	7	8	7	4	4	7
Total	32	35	35	31	35	35	30	32	35	36	34	33	33	32
Total Overall	63	70	69	61	67	68	61	65	70	70	67	69	69	63