Annex A1

PISA 2003 MATHEMATICS ASSESSMENTS: CHARACTERISTICS OF QUESTIONS USED

Note that all the publicly released questions that were used in the PISA 2003 mathematics assessment are presented in Chapter 3. Note as well that the data in these graphs are from the compendium (available at *pisa2003.acer.edu.au/downloads.php*) and that the percentages refer to students that reached the question (the percentage of students who did not reach the question plus the percentage of students that attempted to answer it will therefore add up to more than 100%).

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Table A1.1

Characteristics of released PISA 2003 mathematics items

		OECD	Lc Lc	cation o (PISA sco	n PISA scal are points)	e						
		average		Full/par	tial credit	points		Content area	Competency		Word	
Item code	Item name	correct	Item	-	2	æ	Traditional topic	'Overarching Idea'	cluster	Context	count	Item format
M033Q01	P2000 A View Room Q1	76.77	432	432			Geometry	Space and shape	Reproduction	Personal	Short	Multiple Choice
M034Q01	P2000 Bricks Q1	43.27	582	582			Geometry	Space and shape	Connections	Educational and occupational	Medium	Short Answer
M124Q01	P2000 Walking Q1	36.34	611	611			Algebra	Change and relationships	Reproduction	Personal	Medium	Extended Response
M124Q03	P2000 Walking Q3	20.62	665	605	666	723	Algebra	Change and relationships	Connections	Personal	Medium	Extended Response
M144Q01	P2000 Cube Painting Q1	62.09	497	497			Geometry	Space and shape	Reproduction	Educational and occupational	Short	Short Answer
M144Q02	P2000 Cube Painting Q2	27.44	645	645			Geometry	Space and shape	Connections	Educational and occupational	Short	Short Answer
M144Q03	P2000 Cube Painting Q3	75.16	432	432			Geometry	Space and shape	Connections	Educational and occupational	Short	Multiple Choice
M144Q04	P2000 Cube Painting Q4	38.42	599	599			Geometry	Space and shape	Connections	Educational and occupational	Short	Short Answer
M145Q01	P2000 Cubes Q1	68.03	478	478			Data	Space and shape	Reproduction	Educational and occupational	Medium	Short Answer
M150Q01	P2000 Growing Up Q1	66.96	477	477			Number	Change and relationships	Reproduction	Scientific	Short	Short Answer
M150Q02	P2000 Growing Up Q2	68.77	472	420	525		Data	Change and relationships	Reproduction	Scientific	Medium	Short Answer
M155Q01	P2000 Population Pyramids Q1	64.86	479	479			Data	Change and relationships	Connections	Scientific	Medium	Short Answer

 Table A1.1

 Characteristics of released PISA 2003 mathematics items (continued)

		OECD	() To	cation or PISA scor	n PISA scale re points)						
		average		Full/part	ial credit point	s l	Content area	Competency		Word	
Item code	Item name	correct	Item	-	2 3	Traditional topic	'Overarching Idea'	cluster	Context	count	Item format
M155Q02	P2000 Population Pyramids Q2	60.66	511	492	531	Data	Change and relationships	Connections	Scientific	Long	Extended Response
M155Q03	P2000 Population Pyramids Q3	16.79	674	643	706	Data	Change and relationships	Reflection	Scientific	Long	Extended Response
M179Q01	P2000 Robberies Q1	29.5	635	577	694	Data	Uncertainty	Connections	Public	Short	Extended Response
M192Q01	P2000 Containers Q1	40.41	594	594		Algebra	Change and relationships	Connections	Educational and occupational	Medium	Complex Multiple Choice
M266Q01	P2000 Carpenter Q1	19.95	687	687		Measurement	Space and shape	Connections	Educational and occupational	Medium	Complex Multiple Choice
M273Q01	P2000 Pipelines Q1	54.92	525	525		Geometry	Space and shape	Connections	Educational and occupational	Medium	Complex Multiple Choice
M302Q01	Car Drive Q1	95.32	262	262		Data	Change and relationships	Reproduction	Public	Medium	Short Answer
M302Q02	Car Drive Q2	78.42	414	414		Data	Change and relationships	Connections	Public	Short	Short Answer
M302Q03	Car Drive Q3	30	631	631		Data	Change and relationships	Reflection	Public	Long	Extended Response
M402Q01	Internet Relay Chat Q1	53.72	533	533		Measurement	Change and relationships	Connections	Personal	Medium	Short Answer
M402Q02	Internet Relay Chat Q2	28.79	636	636		Measurement	Change and relationships	Reflection	Personal	Long	Short Answer
M406Q01	Running Tracks Q1	28.66	639	639		Measurement	Space and shape	Connections	Public	Medium	Short Answer
M406Q02	Running Tracks Q2	19.33	687	687		Measurement	Space and shape	Connections	Public	Medium	Short Answer

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Table A1.1	Characteristics of released PISA 2003 mathematics items

		OECD	Γ	ocation on l (PISA score	PISA scale (points)						
		average		Full/partia	ıl credit points		Content area	Competency		Word	
Item code	Item name	correct	Item	-	2 3	- Traditional topic	'Overarching Idea'	cluster	Context	count	Item format
M406Q03	Running Tracks Q3	18.72	692	692		Measurement	Space and shape	Reflection	Public	Short	Extended Response
M408Q01	Lotteries Q1	41.6	587	587		Data	Uncertainty	Connections	Public	Long	Complex Multiple Choice
M411Q01	Diving Q1	51.39	545	545		Number	Quantity	Reproduction	Public	Long	Short Answer
M411Q02	Diving Q2	45.99	564	564		Number	Uncertainty	Connections	Public	Medium	Multiple Choice
M413Q01	Exchange Rate Q1	79.66	406	406		Number	Quantity	Reproduction	Public	Medium	Short Answer
M413Q02	Exchange Rate Q2	73.86	439	439		Number	Quantity	Reproduction	Public	Short	Short Answer
M413Q03	Exchange Rate Q3	40.34	586	586		Number	Quantity	Reflection	Public	Medium	Extended Response
M420Q01	Transport Q1	49.87	544	544		Data	Uncertainty	Reflection	Personal	Long	Complex Multiple Choice
M421Q01	Height Q1	64.97	485	485		Data	Uncertainty	Reproduction	Educational and occupational	Short	Extended Response
M421Q02	Height Q2	17.85	703	703		Number	Uncertainty	Reflection	Educational and occupational	Long	Complex Multiple Choice
M421Q03	Height Q3	38.04	602	602		Data	Uncertainty	Reflection	Educational and occupational	Short	Multiple Choice
M423Q01	Tossing Coins Q1	81.66	407	407		Data	Uncertainty	Reproduction	Personal	Medium	Multiple Choice
M434Q01	Room Numbers Q1*)			Deleta	ed	Number	Quantity	Connections	Public	Long	Short Answer
M438Q01	Exports Q1	78.69	427	427		Data	Uncertainty	Reproduction	Public	Medium	Short Answer
M438Q02	Exports Q2	48.33	565	565		Number	Uncertainty	Connections	Public	Medium	Multiple Choice
M442Q02	Braille Q2	41.78	578	578		Number	Quantity	Reflection	Public	Long	Short Answer

 Table A1.1

 Characteristics of released PISA 2003 mathematics items (continued)

		OECD	Lo Lo	cation or PISA scol	ו PISA scale re points)						
		average		Full/part	ial credit points		Content area	Competency		Word	
Item code	Item name	correct	Item	-	2 3	Traditional topic	'Overarching Idea'	cluster	Context	count	Item format
M446Q01	Thermometer Cricket Q1	68.22	470	470		Number	Change and relationships	Reproduction	Scientific	Medium	Short Answer
M446Q02	Thermometer Cricket Q2	6.79	801	801		Algebra	Change and relationships	Reflection	Scientific	Long	Short Answer
M447Q01	Tile Arrangement Q1	70.23	461	461		Geometry	Space and shape	Reproduction	Public	Short	Multiple Choice
M462Q01	Third Side Q1	14.11	702	671	734	Geometry	Space and shape	Reflection	Scientific	Short	Short Answer
M464Q01	The Fence Q1	25.11	662	662		Measurement	Space and shape	Connections	Public	Short	Short Answer
M467Q01	Coloured Candies Q1	50.21	549	549		Data	Uncertainty	Reproduction	Personal	Short	Multiple Choice
M468Q01	Science Tests Q1	46.77	556	556		Data	Uncertainty	Reproduction	Educational and occupational	Medium	Short Answer
M474Q01	Running Time Q1	74.07	452	452		Number	Quantity	Reproduction	Educational and occupational	Short	Multiple Choice
M484Q01	Bookshelves Q1	60.88	499	499		Number	Quantity	Connections	Educational and occupational	Medium	Short Answer
M496Q01	Cash Withdrawal Q1	53.12	533	533		Number	Quantity	Connections	Public	Medium	Complex Multiple Choice
M496Q02	Cash Withdrawal Q2	65.65	479	479		Number	Quantity	Connections	Public	Short	Short Answer
M505Q01	Litter Q1	51.55	551	551		Data	Uncertainty	Reflection	Scientific	Medium	Extended Response
M509Q01	Earthquake Q1	46.48	557	557		Data	Uncertainty	Reflection	Scientific	Long	Multiple Choice
M510Q01	Choices Q1	48.76	559	559		Number	Quantity	Connections	Educational and occupational	Medium	Short Answer
M513Q01	Test Scores Q1	32.21	620	620		Data	Uncertainty	Connections	Educational and occupational	Long	Extended Response

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		OECD	Lo (cation on PISA scol	ı PISA scale re points)						
		average ⁻ percent		Full/part	ial credit points		Content area	Competency		Word	
Item code	Item name	correct	Item	-	2 3	Traditional topic	'Overarching Idea'	cluster	Context	count	Item format
M520Q01	Skateboard Q1	72.01	480	464	496	Number	Quantity	Reproduction	Personal	Long	Short Answer
M520Q02	Skateboard Q2	45.53	570	570		Number	Quantity	Reproduction	Personal	Short	Multiple Choice
M520Q03	Skateboard Q3	49.78	554	554		Number	Quantity	Connections	Personal	Long	Short Answer
M547Q01	Staircase Q1	78.04	421	421		Number	Space and shape	Reproduction	Educational and occupational	Short	Short Answer
M555Q02	Number Cubes Q2	62.97	503	503		Geometry	Space and shape	Connections	Personal	Long	Complex Multiple Choice
M559Q01	Telephone Rates Q1	61	504	504		Number	Quantity	Reflection	Public	Long	Multiple Choice
M564Q01	Chair Lift Q1	49.26	551	551		Number	Quantity	Reproduction	Public	Medium	Multiple Choice
M564Q02	Chair Lift Q2	45.56	569	569		Number	Uncertainty	Reflection	Public	Medium	Multiple Choice
M571Q01	Stop The Car Q1	48.83	556	556		Algebra	Change and relationships	Reflection	Scientific	Long	Multiple Choice
M598Q01	Making a Booklet Q1	64.15	488	488		Geometry	Space and shape	Reflection	Personal	Long	Short Answer
M603Q01	Number Check Q1	47.1	559	559		Number	Quantity	Connections	Scientific	Long	Complex Multiple Choice
M603Q02	Number Check Q2	36.08	601	601		Number	Quantity	Connections	Scientific	Long	Short Answer
M702Q01	Support for President Q1	35.66	615	615		Data	Uncertainty	Connections	Public	Long	Extended Response
M704Q01	The Best Car Q1	72.91	447	447		Algebra	Change and relationships	Reproduction	Public	Long	Short Answer
M704Q02	The Best Car Q2	25.42	657	657		Algebra	Change and relationships	Reflection	Public	Long	Short Answer
M710Q01	Forecast of Rain Q1	33.88	620	620		Data	Uncertainty	Connections	Public	Long	Multiple Choice

Characteristics of released PISA 2003 mathematics items (continued) Table A1.1

	(continued)
	mathematics items
e A1.1	2003
Table	PISA
	of released
	Characteristics

		OFCD	, Lo	cation on	PISA scale						
		average percent		Full/parti	e pounts) ial credit points		Content area	Competency		Word	
Item code	Item name	correct	Item	-	2 3	- Traditional topic	'Overarching Idea'	cluster	Context	count	Item format
M800Q01	Computer Game Q1	91.77	309	309		Number	Quantity	Reproduction	Personal	Medium	Multiple Choice
M803Q01	Labels Q1	28.14	641	641		Number	Uncertainty	Connections	Educational and occupational	Medium	Short Answer
M806Q01	Step Pattern Q1	66.19	484	484		Number	Quantity	Reproduction	Educational and occupational	Short	Short Answer
M810Q01	Bicycles Q1	68.31	473	473		Number	Quantity	Connections	Personal	Medium	Short Answer
M810Q02	Bicycles Q2	71.71	459	459		Number	Quantity	Connections	Personal	Medium	Short Answer
M810Q03	Bicycles Q3	20.14	670	631	710	Number	Change and relationships	Reflection	Personal	Long	Extended Response
M828Q01	Carbon Dioxide Q1	39.74	593	593		Data	Change and relationships	Reproduction	Scientific	Long	Short Answer
M828Q02	Carbon Dioxide Q2	54.26	533	533		Data	Uncertainty	Connections	Scientific	Medium	Short Answer
M828Q03	Carbon Dioxide Q3	32.08	629	629		Number	Quantity	Connections	Scientific	Long	Short Answer
M833Q01	Seeing the tower Q1	31.81	628	628		Geometry	Space and shape	Connections	Personal	Long	Complex Multiple Choice







Percentage of students who:



Did not reach the question

Answered correctly - 12600 ZAR (unit not required)



Note: Countries are ranked in descending order of students who gave the correct answer.



Note: Countries are ranked in descending order of students who gave the correct answer.



Note: Countries are ranked in descending order of students who gave the correct answer.



Note: Countries are ranked in descending order of students who gave the correct answer.



Figure A1.5 Student performance on The Best Car – Question 1

Note: Countries are ranked in descending order of students who gave the correct answer.



Note: Countries are ranked in descending order of students who gave the correct answer.



Note: Countries are ranked in descending order of total percent correct, that is, allowing for both full and partial credits.





Note: Countries are ranked in descending order of students who gave the correct answer.

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Note: Countries are ranked in descending order of students who gave the correct answer.



Note: Countries are ranked in descending order of total percent correct, that is, percent full credit + half of the percent partial credit.







Note: Countries are ranked in descending order of students who gave the correct answer.

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Figure A1.13 Student performance on Internet Relay Chat – Question 1



Note: Countries are ranked in descending order of students who gave the correct answer.

Figure A1.14 Student performance on Coloured Candies – Question 1



Note: Countries are ranked in descending order of students who gave the correct answer.



Figure A1.16 Student performance on Skateboard – Question 3





Note: Countries are ranked in descending order of students who gave the correct answer.

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Note: Countries are ranked in descending order of students who gave the correct answer C.



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Percentage of students who:



Answered correctly -6

Did not answer the question



Note: Countries are ranked in descending order of students who gave the correct answer.



Note: Countries are ranked in descending order of students who gave the correct answer E.



Note: Countries are ranked in descending order of students who gave the correct answer.



Figure A1.22 Student performance on Growing Up – Question 3

Note: Countries are ranked in descending order of students who gave the correct answer.

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Note: Countries are ranked in descending order of students who gave the correct answer.



Figure A1.24 Student performance on P2000 Walking – Question 1

Percentage of students who:

Note: Countries are ranked in descending order of students who gave the correct answer.



Figure A1.25 Student performance on Support for the President – Question 1

Note: Countries are ranked in descending order of students who gave the correct answer.



Percentage of students who:

Gave an incorrect answer giving no or wrong mathematical reasons or simply describing differences

Did not answer the question

Did not reach the question

Answered correctly – one valid argument is given (number of students passing, disproportionate influence of outlier, number of students with scores in the highest level)

Hong Kong-China Macao-China Japan Canada Korea Belgium Australia Sweden United Kingdom New Zealand Netherlands Ireland United States Iceland France Liechtenstein Finland Norway Switzerland OECD average Denmark Austria Spain Luxembourg Germany Portugal Hungary Poland Latvia Thailand **Czech Republic** Greece Slovak Republic **Russian** Federation Turkey Italy Uruguay Brazil Mexico Indonesia Serbia Tunisia 60 -100 -80 -60 -40 -20 0 20 40 80 100

Note: Countries are ranked in descending order of students who gave the correct answer.



Percentage of students who:



Note: Countries are ranked in descending order of total percent correct, that is, allowing for both full and partial credits.



Note: Countries are ranked in descending order of students who gave the correct answer.



Note: Countries are ranked in descending order of students who gave the correct answer.



Figure A1.30 Student performance on Walking – Question 3

Note: Countries are ranked in descending order of total percent correct, that is, allowing for both full and partial credits.





Note: Countries are ranked in descending order of students who gave the correct answer.



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