Content Domain	Main Topic	Cognitive Domain
DATA	Data Interpretation	Reasoning

Test score frequency table

The table shows scores for a class on a 10-point test.

Test Score	Tally	Frequency
4	/	1
5	///	3
6	///// /	6
7	//	2
8	////	4
9	///	3
10	/	1

How many in the class had a score greater than 7 ?

Ⓐ 2

Ⓑ 8

Ⓒ 10

Ⓓ 12

Ⓔ 20

Item Number: M012037

Overall Percent Correct

Korea, Republic of	85	▲
Netherlands	77	▲
Slovenia	68	▲
Belgium (Flemish)	67	▲
Sweden	65	▲
United States	65	▲
Scotland	64	▲
Singapore	63	▲
Lithuania	61	▲
Israel	59	▲
New Zealand	59	▲
England	58	▲
Estonia	58	▲
Australia	56	▲
Hungary	56	▲
Serbia and Montenegro	56	▲
Norway	55	▲
Indonesia	53	▲
Latvia	53	▲
Russian Federation	52	O
Bahrain	51	O
Chinese Taipei	51	O
Macedonia, Republic of	51	O
Slovak Republic	49	O
Hong Kong, SAR	48	O
International average	**48**	
Malaysia	47	O
Romania	47	O
Jordan	46	O
Italy	45	O
Japan	44	▼
Cyprus	42	▼
Egypt	42	▼
Iran, Islamic Republic of	42	▼
Armenia	39	▼
Philippines	39	▼
Palestinian Nat'l Auth.	36	▼
Tunisia	35	▼
Bulgaria	34	▼
Botswana	33	▼
Chile	33	▼
Lebanon	31	▼
Moldova, Republic of	31	▼
Ghana	27	▼
Saudi Arabia	26	▼
South Africa	22	▼
Morocco	21	▼

Correct Response: B

Country average vs. International average:

Higher	▲
Not different	O
Lower	▼

Content Domain	Main Topic	Cognitive Domain
DATA	Data interpretation	Reasoning

How many pencils sold from bar graph

The graph shows the number of pens, pencils, rulers, and erasers sold by a store in one week.
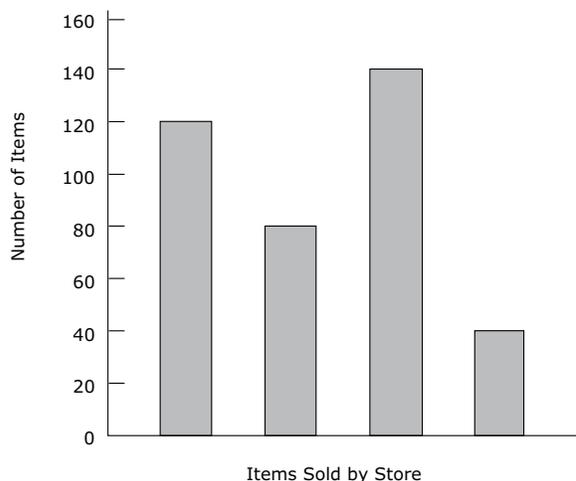
The names of the items are missing from the graph. Pens were the item most often sold, and fewer erasers than any other item were sold. More pencils than rulers were sold. How many pencils were sold?

(A)   40

(B)   80

(C)   120

(D)   140

Item Number: M022189

Correct Response: **C**

Overall Percent Correct

Belgium (Flemish)	90	▲
Chinese Taipei	89	▲
Japan	88	▲
Hong Kong, SAR	88	▲
Korea, Republic of	87	▲
Malaysia	87	▲
Estonia	87	▲
Slovenia	86	▲
United States	86	▲
Sweden	86	▲
Netherlands	85	▲
Hungary	85	▲
Scotland	84	▲
Singapore	83	▲
Latvia	82	▲
Slovak Republic	80	▲
Russian Federation	80	▲
Italy	80	▲
Norway	78	▲
England	78	▲
New Zealand	78	▲
Lithuania	77	▲
Cyprus	76	▲
Australia	76	▲
Israel	70	O
International average	**67**	
Bulgaria	67	O
Bahrain	66	O
Serbia and Montenegro	63	▼
Moldova, Republic of	62	▼
Iran, Islamic Republic of	61	▼
Macedonia, Republic of	59	▼
Romania	59	▼
Jordan	59	▼
Morocco	53	▼
Armenia	51	▼
Chile	50	▼
Egypt	49	▼
Indonesia	49	▼
Palestinian Nat'l Auth.	48	▼
Saudi Arabia	45	▼
Lebanon	42	▼
Tunisia	40	▼
Botswana	37	▼
Philippines	32	▼
South Africa	28	▼
Ghana	24	▼

Country average vs. International average:

Higher	▲
Not different	O
Lower	▼

Content Domain	Main Topic	Cognitive Domain
DATA	Data interpretation	Reasoning

Phone plans: least expensive plan for Betty

Betty talks for less than 2 hours per month. Which plan would be less expensive for her?

Less expensive plan _____

Explain your answer in terms of both the monthly fee and free minutes.

Item Number: M032762

SCORING

Correct Response

- Plan B with explanation that includes free minutes used and explicit reference to lower monthly fee for Plan B.

Partial Response

- Plan B with explicit reference to lower monthly fee and no reference to free minutes.

Incorrect Response

- Plan B with inadequate (only free minutes) or no explanation.
- Plan A with or without explanation.
- Other incorrect (including crossed out/erased, stray marks, illegible, or off task).

Overall Percent Correct

Japan	49	▲
England	45	▲
Australia	44	▲
Estonia	44	▲
Korea, Republic of	40	▲
Singapore	40	▲
Hungary	39	▲
Belgium (Flemish)	38	▲
Lithuania	37	▲
United States	37	▲
Scotland	36	▲
Israel	33	▲
New Zealand	30	▲
Netherlands	28	▲
Hong Kong, SAR	28	▲
Slovenia	27	▲
Sweden	27	▲
Malaysia	27	▲
Chinese Taipei	27	▲
Slovak Republic	26	▲
Italy	23	O
Latvia	22	O
International average	**21**	
Jordan	20	O
Bahrain	18	O
Norway	18	▼
Romania	16	▼
Russian Federation	15	▼
Egypt	14	▼
Cyprus	13	▼
Indonesia	12	▼
Serbia and Montenegro	12	▼
Chile	12	▼
Bulgaria	12	▼
Lebanon	11	▼
Philippines	11	▼
Macedonia, Republic of	10	▼
Saudi Arabia	8	▼
Morocco	7	▼
South Africa	6	▼
Palestinian Nat'l Auth.	5	▼
Iran, Islamic Republic of	4	▼
Tunisia	4	▼
Ghana	3	▼
Botswana	2	▼
Armenia	2	▼
Moldova, Republic of	1	▼

Country average vs. International average:	
Higher	▲
Not different	O
Lower	▼

Phone plans: least expensive plan for Betty (continued)

Item Number: M032762

Student Responses

Correct Response:

Betty talks for less than 2 hours per month. Which plan would be less expensive for her?

Less expensive plan ___B___

Explain your answer in terms of both the monthly fee and free minutes.

She talks for under an hours and it pays the least zeds

Questions for Phone Plans continue.

Partial Response:

Betty talks for less than 2 hours per month. Which plan would be less expensive for her?

Less expensive plan ___B___

Explain your answer in terms of both the monthly fee and free minutes.

Plan A is cost a lot of money. Monthly fee is 20zeds.
Plan A is cost a less of money. Monthly fee is 15zeds.

Incorrect Response:

Betty talks for less than 2 hours per month. Which plan would be less expensive for her?

Less expensive plan ___B___

Explain your answer in terms of both the monthly fee and free minutes.

Since Betty calls for 2hrs which is 120 min she will pay less for plan B. Because she will use her free units.

Content Domain	Main Topic	Cognitive Domain
DATA	Data interpretation	Solving Routine Problems

Graph of cooling water

A beaker of water which has reached boiling point is allowed to cool. The temperature of the water is recorded at five minute intervals, and a temperature-time graph is drawn.

Cooling Curve
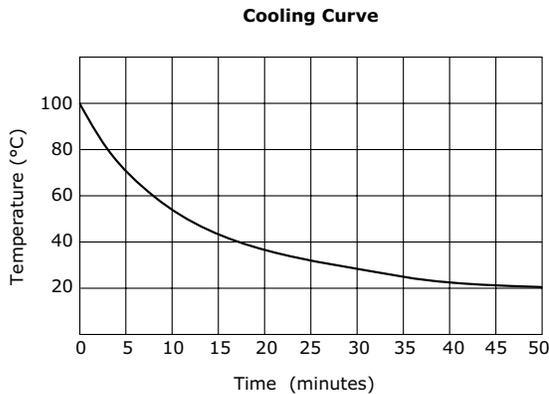
About how many minutes did it take for the water to cool the first 20 degrees?

Ⓐ   3

Ⓑ   8

Ⓒ   37

Ⓓ   50

Item Number: M022135

Correct Response: **A**

Overall Percent Correct

Belgium (Flemish)	70	▲
Sweden	62	▲
Australia	59	▲
Estonia	57	▲
Hungary	56	▲
Scotland	55	▲
England	55	▲
Norway	54	▲
Singapore	54	▲
Netherlands	53	▲
United States	52	▲
New Zealand	49	▲
Lithuania	49	▲
Latvia	47	▲
Chinese Taipei	45	▲
Lebanon	40	▲
Italy	40	▲
Slovenia	39	▲
Japan	39	▲
Russian Federation	38	▲
Israel	36	O
Indonesia	35	O
Armenia	35	O
Slovak Republic	34	O
Malaysia	33	O
International average	**33**	
Serbia and Montenegro	33	O
Bulgaria	32	O
Romania	30	O
Moldova, Republic of	28	▼
Hong Kong, SAR	26	▼
Chile	25	▼
Cyprus	21	▼
Jordan	18	▼
Iran, Islamic Republic of	18	▼
Macedonia, Republic of	17	▼
South Africa	14	▼
Palestinian Nat'l Auth.	14	▼
Ghana	13	▼
Botswana	12	▼
Korea, Republic of	11	▼
Bahrain	11	▼
Morocco	10	▼
Philippines	10	▼
Saudi Arabia	9	▼
Egypt	8	▼
Tunisia	4	▼

Country average vs. International average:	
Higher	▲
Not different	O
Lower	▼

Content Domain	Main Topic	Cognitive Domain
DATA	Data interpretation	Solving Routine Problems

Phone plans: cost of plans for Frank

Frank talks for 5 hours per month at the night rate. What would each plan cost him per month? Show your work.

Cost Per Month for Plan A: _____ zeds

Cost Per Month for Plan B: _____ zeds

Item Number: M032763

SCORING

Correct Response

• Plan A= 140 zeds and Plan B = 375 zeds, with work shown.

Partial Response

• 140 zeds and 375 zeds with no work shown.

• Plan A or plan B correct with work shown but not both.

Incorrect Response

• Incorrect (including crossed out/erased, stray marks, illegible, or off task).

Overall Percent Correct

Singapore	27	▲
Japan	19	▲
Chinese Taipei	18	▲
Hong Kong, SAR	15	▲
Korea, Republic of	15	▲
Netherlands	14	▲
Sweden	12	▲
Lithuania	11	▲
Belgium (Flemish)	11	▲
Estonia	10	▲
Hungary	10	▲
England	8	O
United States	8	▲
New Zealand	7	O
Scotland	7	O
Slovak Republic	7	O
Australia	7	O
Israel	6	O
Malaysia	6	O
International average	**6**	
Latvia	6	O
Slovenia	5	O
Russian Federation	5	O
Romania	5	O
Norway	5	O
Bulgaria	4	O
Serbia and Montenegro	3	▼
Italy	3	▼
Moldova, Republic of	2	▼
Jordan	1	▼
Cyprus	1	▼
Macedonia, Republic of	1	▼
Indonesia	1	▼
South Africa	1	▼
Armenia	1	▼
Palestinian Nat'l Auth.	1	▼
Philippines	1	▼
Chile	0	▼
Iran, Islamic Republic of	0	▼
Egypt	0	▼
Lebanon	0	▼
Bahrain	0	▼
Ghana	0	▼
Tunisia	0	▼
Morocco	0	▼
Botswana	0	▼
Saudi Arabia	0	▼

Country average vs. International average:	
Higher	▲
Not different	O
Lower	▼

Phone plans: cost of plans for Frank (continued)

Item Number: M032763

Student Responses

Correct Response:

Frank talks for 5 hours per month at the night rate. What would each plan cost him per month? Show your work.

Cost Per Month for Plan A: _____ 140 _____ zeds

Cost Per Month for Plan B: _____ 375 _____ zeds

Plan A - 1zed - 180 mins free
Plan B - 2zed - 120 mins free

Plan A - 3 hours free
     120 zeds
 +   20
     140 zed

Plan B - 2 hours free
     360 zeds
      15
     375

Inorrect Response:

Frank talks for 5 hours per month at the night rate. What would each plan cost him per month? Show your work.

Cost Per Month for Plan A: _____ 140 _____ zeds

Cost Per Month for Plan B: _____ 255 _____ zeds

Content Domain	Main Topic	Cognitive Domain
DATA	Data interpretation	Solving Routine Problems

Phone plans: minutes talk by Darlene

Darlene signed up for the *Plan B*, and the cost of one month of service was 75 zeds. How many minutes did she talk that month? Show your work.

Minutes talked _____

Item Number: M032764

SCORING

Correct Response

• 150 with work shown.

Partial Response

• 150 with no work shown.
• Correct method but with calculation error.
• 12 30 with calculations leading to 30.

Incorrect Response

• Incorrect (including crossed out/erased, stray marks, illegible, or off task).

Overall Percent Correct

Singapore	28	▲
Korea, Republic of	22	▲
Hong Kong, SAR	21	▲
Chinese Taipei	20	▲
Japan	19	▲
Netherlands	17	▲
Belgium (Flemish)	13	▲
Sweden	12	▲
Estonia	11	▲
England	11	▲
Hungary	9	▲
Lithuania	9	▲
Australia	8	O
United States	8	▲
Slovak Republic	8	O
New Zealand	7	O
International average	**6**	
Latvia	6	O
Scotland	6	O
Slovenia	5	O
Israel	5	O
Romania	5	O
Norway	5	O
Russian Federation	4	▼
Malaysia	4	▼
Ghana	3	▼
Bulgaria	3	▼
Italy	3	▼
Moldova, Republic of	2	▼
Jordan	2	▼
Cyprus	2	▼
Serbia and Montenegro	2	▼
Macedonia, Republic of	1	▼
Indonesia	1	▼
South Africa	1	▼
Bahrain	1	▼
Lebanon	0	▼
Tunisia	0	▼
Iran, Islamic Republic of	0	▼
Chile	0	▼
Philippines	0	▼
Armenia	0	▼
Palestinian Nat'l Auth.	0	▼
Morocco	0	▼
Botswana	0	▼
Egypt	0	▼
Saudi Arabia	0	▼

Country average vs. International average:	
Higher	▲
Not different	O
Lower	▼

Phone plans: minutes talk by Darlene (continued)

Item Number: M032764

Student Responses

Correct Response:

Darlene signed up for the *Plan B*, and the cost of one month of service was 75 zeds. How many minutes did she talk that month? Show your work.

Minutes talked __150__

$$\begin{array}{r} 75 \\ -15 \\ \hline 60 \end{array} \qquad 2\overline{)60}\,^{30} \qquad \begin{array}{r} 120 \\ +\ 30 \\ \hline 150 \end{array}$$

Partial Response:

Darlene signed up for the *Plan B*, and the cost of one month of service was 75 zeds. How many minutes did she talk that month? Show your work.

Minutes talked __1325 minutes__.

$$75 - 15 = 65$$

$$2\overline{)65}\,^{32.5} \qquad \begin{array}{r} 32.5 \\ +120 \\ \hline 1325 \end{array}$$

Incorrect Response:

Darlene signed up for the *Plan B,* and the cost of one month of service was 75 zeds. How many minutes did she talk that month? Show your work.

Minutes talked __157.5__

$$75 \div 2 = 37.5$$

$$120 \text{ free talk time} =$$

$$157.5$$

Content Domain	Main Topic	Cognitive Domain
DATA	Data Interpretation	Using Concepts

Comparison of two average scores

Joe had three test scores of 78, 76, and 74, while Mary had scores of 72, 82, and 74. How did Joe's average (mean) score compare with Mary's average (mean) score?

- Ⓐ   Joe's was 1 point higher.
- Ⓑ   Joe's was 1 point lower.
- Ⓒ   Both averages were the same.
- Ⓓ   Joe's was 2 points higher.
- Ⓔ   Joe's was 2 points lower.

Item Number: M012006

Correct Response:	**C**

Overall Percent Correct

Country		
Chinese Taipei	90	▲
Korea, Republic of	90	▲
Singapore	88	▲
Hong Kong, SAR	87	▲
Malaysia	84	▲
Japan	81	▲
Slovak Republic	78	▲
Lithuania	76	▲
Netherlands	76	▲
Latvia	75	▲
Tunisia	75	▲
Slovenia	74	▲
United States	74	▲
Bulgaria	73	▲
Israel	73	▲
Scotland	73	▲
Estonia	72	▲
Hungary	72	▲
Moldova, Republic of	72	O
Romania	72	▲
Serbia and Montenegro	72	▲
Russian Federation	70	O
Australia	69	O
Belgium (Flemish)	69	O
Italy	69	O
International average	**68**	
Macedonia, Republic of	68	O
Sweden	66	O
Armenia	65	O
Cyprus	65	O
Iran, Islamic Republic of	64	O
Morocco	64	O
Chile	62	▼
Norway	61	▼
Philippines	61	▼
Egypt	60	▼
England	60	▼
New Zealand	60	▼
Bahrain	58	▼
Indonesia	56	▼
Botswana	53	▼
Jordan	52	▼
Palestinian Nat'l Auth.	51	▼
Ghana	43	▼
South Africa	43	▼
Saudi Arabia	38	▼

Country average vs. International average:	
Higher	▲
Not different	O
Lower	▼

Content Domain	Main Topic	Cognitive Domain
DATA	Data Interpretation	Using Concepts

Pie graph of crop distribution

The graph shows the distribution of crops grown in a certain country.
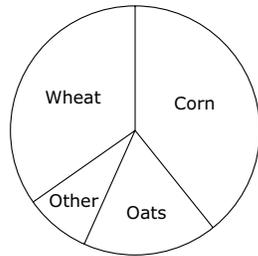
According to the information in the graph, which of these statements is true?

- Ⓐ   More oats are grown than wheat.
- Ⓑ   Corn is more than one-half of the country's crop.
- Ⓒ   Oats are more than one-third of the country's crop.
- Ⓓ   The total crop of oats and wheat is greater than the corn crop.

Item Number: M012014

Correct Response: **D**

Overall Percent Correct

Korea, Republic of	93	▲
Japan	92	▲
Netherlands	88	▲
Australia	86	▲
Belgium (Flemish)	86	▲
Sweden	85	▲
Hong Kong, SAR	85	▲
Chinese Taipei	84	▲
Latvia	84	▲
Singapore	83	▲
Slovak Republic	82	▲
England	82	▲
Estonia	82	▲
Slovenia	82	▲
Lithuania	82	▲
Hungary	81	▲
New Zealand	81	▲
United States	81	▲
Scotland	81	▲
Israel	79	▲
Norway	78	▲
Russian Federation	78	▲
Cyprus	76	▲
Italy	74	O
Romania	72	O
International average	**71**	
Tunisia	71	O
Bulgaria	70	O
Egypt	69	O
Moldova, Republic of	67	O
Morocco	67	O
Jordan	66	▼
Macedonia, Republic of	65	▼
Serbia and Montenegro	65	▼
Iran, Islamic Republic of	64	▼
Malaysia	63	▼
Bahrain	63	▼
Palestinian Nat'l Auth.	61	▼
Armenia	60	▼
Chile	57	▼
Saudi Arabia	52	▼
Botswana	51	▼
Philippines	50	▼
Lebanon	49	▼
Indonesia	45	▼
Ghana	41	▼
South Africa	33	▼

Country average vs. International average:	
Higher	▲
Not different	O
Lower	▼

Content Domain	Main Topic	Cognitive Domain
DATA	Uncertainty and Probability	Reasoning

Most likely sector on spinner

The figure below shows a spinner with 24 sectors. When someone spins the arrow, it is equally likely to stop on any sector.
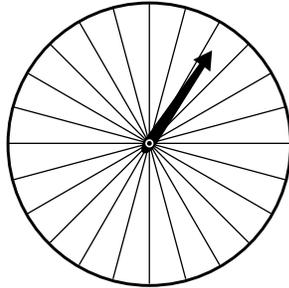
$\frac{1}{8}$ of the sectors are blue, $\frac{1}{24}$ are purple, $\frac{1}{2}$ are orange, and $\frac{1}{3}$ are red. If a person spins the arrow, on which color sector is the spinner LEAST likely to stop?

(A) blue

(B) purple

(C) orange

(D) red

Item Number: M022252

Correct Response: **B**

Overall Percent Correct

Country		
Hong Kong, SAR	87	▲
Chinese Taipei	85	▲
Netherlands	85	▲
Japan	82	▲
Sweden	81	▲
Belgium (Flemish)	81	▲
England	79	▲
Singapore	79	▲
Korea, Republic of	79	▲
United States	78	▲
Australia	78	▲
Hungary	76	▲
Scotland	76	▲
Israel	74	▲
Slovenia	74	▲
Norway	73	▲
Estonia	73	▲
Latvia	71	▲
New Zealand	71	▲
Slovak Republic	69	▲
Cyprus	69	▲
Lithuania	67	▲
Serbia and Montenegro	66	▲
Malaysia	65	▲
Bulgaria	60	O
Russian Federation	60	O
International average	**60**	
Italy	58	O
Romania	57	O
Macedonia, Republic of	54	▼
Armenia	47	▼
Moldova, Republic of	46	▼
Jordan	46	▼
Philippines	43	▼
Iran, Islamic Republic of	43	▼
Egypt	43	▼
Lebanon	42	▼
Palestinian Nat'l Auth.	41	▼
Bahrain	40	▼
Morocco	39	▼
Chile	38	▼
Indonesia	37	▼
Botswana	34	▼
Saudi Arabia	34	▼
Ghana	34	▼
South Africa	34	▼
Tunisia	31	▼

Country average vs. International average:	
Higher	▲
Not different	O
Lower	▼

Content Domain	Main Topic	Cognitive Domain
DATA	Uncertainty and Probability	Reasoning

In a school there were 1200 students

In a school there were 1,200 students (boys and girls). A sample of 100 students was selected at random, and 45 boys were found in the sample. Which of these is most likely to be the number of boys in the school?

Ⓐ 450

Ⓑ 500

Ⓒ 540

Ⓓ 600

Item Number: M032271

Correct Response:	**C**

Overall Percent Correct

Hong Kong, SAR	81	▲
Singapore	80	▲
Netherlands	78	▲
Chinese Taipei	77	▲
Korea, Republic of	75	▲
Belgium (Flemish)	71	▲
Japan	66	▲
Estonia	61	▲
Sweden	61	▲
United States	60	▲
Hungary	56	▲
Australia	56	▲
New Zealand	55	▲
Lithuania	55	▲
Italy	55	▲
Scotland	53	▲
Russian Federation	52	▲
Latvia	50	O
Malaysia	49	O
England	49	O
Israel	47	O
International average	**47**	
Norway	46	O
Slovak Republic	45	O
Serbia and Montenegro	44	O
Moldova, Republic of	44	O
Slovenia	44	O
Bulgaria	43	O
Cyprus	43	▼
Lebanon	41	▼
Armenia	39	▼
Tunisia	39	▼
Jordan	39	▼
Romania	38	▼
Egypt	38	▼
Macedonia, Republic of	36	▼
Iran, Islamic Republic of	35	▼
Indonesia	34	▼
Chile	32	▼
Palestinian Nat'l Auth.	32	▼
Philippines	31	▼
Morocco	28	▼
Botswana	28	▼
Saudi Arabia	26	▼
Bahrain	23	▼
South Africa	23	▼
Ghana	23	▼

Country average vs. International average:	
Higher	▲
Not different	O
Lower	▼

Content Domain	Main Topic	Cognitive Domain
DATA	Uncertainty and Probability	Solving Routine Problems

Number of students from probability

In an eighth-grade class of 30 students, the probability that a student chosen at random will be less than 13 years old is $\frac{1}{5}$. How many students in the class are less than 13 years old?

- (A) Two
- (B) Three
- (C) Four
- (D) Five
- (E) Six

Item Number: M022146

Correct Response:	**E**

Overall Percent Correct

Country		
Korea, Republic of	89	▲
Singapore	87	▲
Chinese Taipei	86	▲
Japan	86	▲
Hong Kong, SAR	84	▲
Netherlands	82	▲
Belgium (Flemish)	79	▲
Sweden	71	▲
Malaysia	69	▲
Scotland	66	▲
England	63	▲
Armenia	62	▲
Australia	60	▲
Latvia	59	▲
United States	58	▲
Estonia	57	▲
Italy	56	▲
Hungary	55	▲
Israel	54	▲
New Zealand	54	O
Cyprus	53	O
Slovenia	53	O
Lithuania	52	O
Russian Federation	51	O
Norway	50	O
Bulgaria	50	O
International average	**50**	
Slovak Republic	50	O
Serbia and Montenegro	46	O
Indonesia	42	▼
Romania	39	▼
Iran, Islamic Republic of	37	▼
Jordan	33	▼
Egypt	33	▼
Botswana	32	▼
Macedonia, Republic of	32	▼
Philippines	32	▼
Moldova, Republic of	31	▼
Palestinian Nat'l Auth.	28	▼
Lebanon	28	▼
Ghana	28	▼
South Africa	26	▼
Bahrain	24	▼
Chile	23	▼
Tunisia	22	▼
Saudi Arabia	18	▼
Morocco	18	▼

Country average vs. International average:	
Higher	▲
Not different	O
Lower	▼

Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Congruence and Similarity	Knowing Facts and Procedures

Draw a line to divide triangle ABC
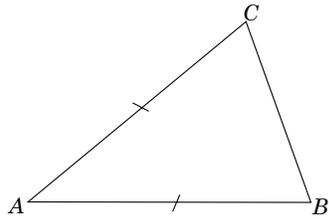
The triangle ABC has $AB = AC$.

Draw a line to divide triangle ABC into two congruent triangles.

Item Number: M032403

SCORING

Correct Response
- Line drawn from A to (approximate) midpoint of BC.

Incorrect Response
- Line drawn from C or B.
- Other incorrect (including crossed out/erased, stray marks, illegible or off task).

Overall Percent Correct

Singapore	88	▲
Japan	86	▲
Korea, Republic of	84	▲
Hong Kong, SAR	79	▲
Armenia	77	▲
Russian Federation	73	▲
Belgium (Flemish)	72	▲
Chinese Taipei	71	▲
Latvia	71	▲
Lithuania	70	▲
Estonia	69	▲
Israel	66	▲
Bahrain	65	▲
Romania	62	▲
Bulgaria	61	▲
Slovak Republic	60	▲
Netherlands	59	▲
Moldova, Republic of	56	O
Lebanon	55	O
Australia	55	O
United States	54	O
Slovenia	53	O
Tunisia	53	O
Hungary	53	O
Malaysia	52	O
International average	**52**	
Cyprus	51	O
England	48	O
New Zealand	48	O
Jordan	47	▼
Scotland	47	O
Italy	45	▼
Iran, Islamic Republic of	43	▼
Norway	42	▼
Morocco	41	▼
Serbia and Montenegro	40	▼
Egypt	40	▼
Saudi Arabia	39	▼
Palestinian Nat'l Auth.	36	▼
Macedonia, Republic of	35	▼
Indonesia	26	▼
Sweden	20	▼
Chile	19	▼
Botswana	14	▼
Philippines	11	▼
South Africa	7	▼

Country average vs. International average:

Higher	▲
Not different	O
Lower	▼

Draw a line to divide triangle ABC (continued)
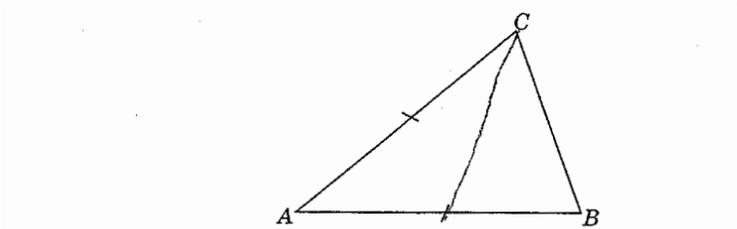
Item Number: M032403

Student Responses
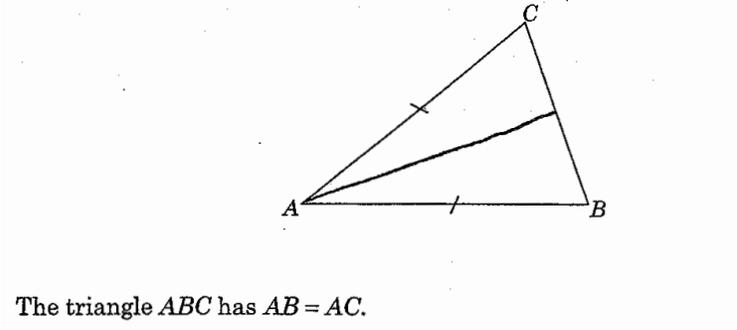
Correct:

The triangle ABC has $AB = AC$.

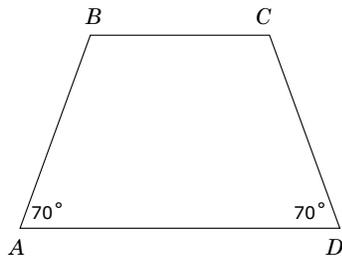Draw a line to divide triangle ABC into two congruent triangles.

Incorrect:

The triangle ABC has $AB = AC$.

Draw a line to divide triangle ABC into two congruent triangles.

Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Congruence and Similarity	Reasoning

Property of congruent trapezoids

ABCD is a trapezoid.

Another trapezoid, *GHIJ* (not shown), is congruent (the same size and shape) to *ABCD*. Angles *G* and *J* each measure 70°. Which of these could be true?

- Ⓐ   *GH* = *AB*
- Ⓑ   Angle *H* is a right angle.
- Ⓒ   All sides of *GHIJ* are the same length.
- Ⓓ   The perimeter of *GHIJ* is 3 times the perimeter of *ABCD*.
- Ⓔ   The area of *GHIJ* is less than the area of *ABCD*.

Item Number: M012015

Correct Response:	**A**

Overall Percent Correct

Korea, Republic of	86	▲
Estonia	84	▲
Japan	83	▲
Hong Kong, SAR	81	▲
Singapore	81	▲
Chinese Taipei	79	▲
Latvia	77	▲
Russian Federation	77	▲
Lithuania	74	▲
Belgium (Flemish)	73	▲
Slovak Republic	73	▲
Netherlands	69	▲
United States	69	▲
Hungary	69	▲
Slovenia	68	▲
Romania	68	▲
Italy	67	▲
Bulgaria	67	▲
Australia	66	▲
Israel	66	▲
Scotland	64	O
Malaysia	64	O
Moldova, Republic of	63	O
Sweden	62	O
Morocco	62	O
Tunisia	62	O
New Zealand	61	O
Cyprus	61	O
International average	**60**	
Macedonia, Republic of	60	O
Armenia	59	O
Norway	58	O
England	57	O
Indonesia	56	O
Serbia and Montenegro	56	▼
Lebanon	55	▼
Bahrain	54	▼
Jordan	48	▼
Iran, Islamic Republic of	45	▼
Saudi Arabia	39	▼
Chile	39	▼
Palestinian Nat'l Auth.	37	▼
Egypt	35	▼
Botswana	34	▼
Philippines	30	▼
Ghana	25	▼
South Africa	24	▼

Country average vs. International average:	
Higher	▲
Not different	O
Lower	▼

Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Congruence and Similarity	Using Concepts

False statement of congruent triangles

In square *EFGH*, which of these is FALSE?

- (A) Δ*EIF* and Δ*EIH* are congruent.
- (B) Δ*GHI* and Δ*GHF* are congruent.
- (C) Δ*EFH* and Δ*EGH* are congruent.
- (D) Δ*EIF* and Δ*GIH* are congruent.
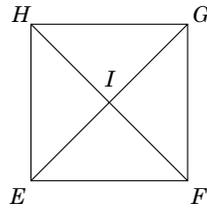
Item Number: M012005

Correct Response: **B**

Overall Percent Correct

Country	%	
Korea, Republic of	86	▲
Japan	85	▲
Chinese Taipei	82	▲
Estonia	82	▲
Hong Kong, SAR	79	▲
Latvia	78	▲
Bulgaria	74	▲
Russian Federation	74	▲
Lithuania	73	▲
Netherlands	72	▲
Singapore	72	▲
Cyprus	69	▲
Belgium (Flemish)	68	▲
Slovak Republic	68	▲
Romania	64	▲
Armenia	62	▲
Israel	62	▲
Sweden	62	▲
Slovenia	61	▲
Italy	58	O
Morocco	58	O
Bahrain	57	O
International average	**56**	
Moldova, Republic of	56	O
Indonesia	55	O
United States	55	O
Jordan	54	O
Iran, Islamic Republic of	53	O
Malaysia	50	▼
Tunisia	49	▼
Egypt	46	▼
Norway	46	▼
Hungary	45	▼
Lebanon	45	▼
Macedonia, Republic of	45	▼
Palestinian Nat'l Auth.	44	▼
Scotland	44	▼
Australia	43	▼
New Zealand	42	▼
Serbia and Montenegro	41	▼
Philippines	39	▼
England	35	▼
Saudi Arabia	35	▼
Chile	28	▼
South Africa	26	▼
Botswana	25	▼

Country average vs. International average:

Higher	▲
Not different	O
Lower	▼

Content Domain	**Main Topic**	**Cognitive Domain**
GEOMETRY	Congruence and Similarity	Using Concepts

Identify similar triangles

8 cm   10 cm

12 cm

Which of the following triangles is similar to the triangle shown above?

(A) 12 cm, 15 cm, 10 cm

(B) 14 cm, 10 cm, 12 cm

(C) 12 cm, 8 cm, 6 cm

(D) 16 cm, 24 cm, 20 cm

Item Number: M032261

Correct Response:	**D**

Overall Percent Correct

Korea, Republic of	83	▲
Hong Kong, SAR	76	▲
Singapore	75	▲
Japan	70	▲
Chinese Taipei	68	▲
Russian Federation	61	▲
Netherlands	60	▲
Belgium (Flemish)	59	▲
Iran, Islamic Republic of	54	▲
Hungary	51	▲
Malaysia	51	▲
Lithuania	50	▲
Latvia	49	▲
Estonia	46	▲
United States	46	▲
Lebanon	46	O
Italy	44	O
England	43	O
International average	**42**	
Jordan	41	O
Philippines	41	O
Sweden	41	O
Australia	40	O
Romania	39	O
Serbia and Montenegro	38	O
Palestinian Nat'l Auth.	38	▼
Moldova, Republic of	38	O
New Zealand	37	▼
Slovak Republic	37	▼
Armenia	36	▼
Israel	36	▼
Macedonia, Republic of	36	▼
Cyprus	34	▼
Norway	34	▼
Egypt	34	▼
Indonesia	33	▼
Bulgaria	31	▼
Slovenia	30	▼
Scotland	29	▼
Bahrain	27	▼
Chile	25	▼
Ghana	23	▼
Botswana	23	▼
South Africa	21	▼
Morocco	21	▼
Tunisia	16	▼
Saudi Arabia	12	▼

Country average vs. International average:	
Higher	▲
Not different	O
Lower	▼

Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Lines and Angles	Knowing Facts and Procedures

Sum of angles equal to 180 degrees

In this figure, *PQ* and *RS* are parallel.
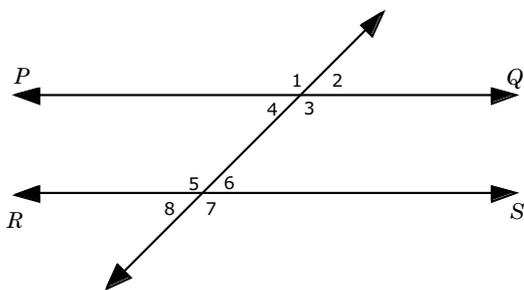
Of the following, which pair of angles has the sum of 180°?

- Ⓐ ∠ 5 and ∠ 7
- Ⓑ ∠ 3 and ∠ 6
- Ⓒ ∠ 1 and ∠ 5
- Ⓓ ∠ 1 and ∠ 7
- Ⓔ ∠ 2 and ∠ 8

Item Number: M022142

Correct Response: **B**

Overall Percent Correct

Japan	83	▲
Korea, Republic of	81	▲
Hong Kong, SAR	79	▲
Singapore	72	▲
Chinese Taipei	67	▲
Estonia	63	▲
Belgium (Flemish)	62	▲
Latvia	56	▲
Russian Federation	54	▲
Australia	49	▲
Lithuania	49	▲
England	48	O
Israel	47	O
Bulgaria	47	O
Moldova, Republic of	47	O
Hungary	47	O
Slovak Republic	46	O
Bahrain	46	O
Netherlands	45	O
New Zealand	45	O
Serbia and Montenegro	43	O
International average	**43**	
Armenia	43	O
Cyprus	42	O
Scotland	41	O
Slovenia	41	O
Romania	41	O
Malaysia	41	O
Lebanon	38	▼
Egypt	37	▼
United States	37	▼
Italy	36	▼
Macedonia, Republic of	35	▼
Palestinian Nat'l Auth.	34	▼
Norway	34	▼
Sweden	32	▼
Indonesia	31	▼
Jordan	29	▼
Tunisia	28	▼
Morocco	28	▼
Philippines	26	▼
Iran, Islamic Republic of	25	▼
Chile	25	▼
South Africa	23	▼
Ghana	22	▼
Saudi Arabia	22	▼
Botswana	19	▼

Country average vs. International average:

Higher	▲
Not different	O
Lower	▼

Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Lines and Angles	Reasoning

Measure of angle in adjacent angles

In the figure, the measure of $\angle POR$ is 110°, the measure of $\angle QOS$ is 90°, and the measure of $\angle POS$ is 140°.
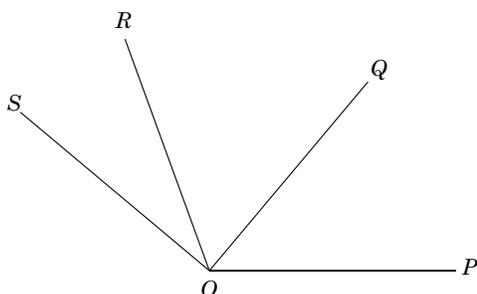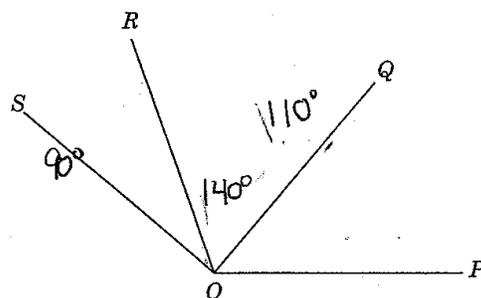

What is the measure of $\angle QOR$?

Answer: _____

Item Number: M022202

SCORING

Correct Response

• 60

Incorrect Response

• 30 OR 50 [140° – 110° or 140° – 90°]

• 55 [110 ÷ 2]

• Other incorrect (including crossed out/erased, stray marks, illegible, or off task).

Overall Percent Correct

Korea, Republic of	63	▲
Japan	60	▲
Singapore	58	▲
Hong Kong, SAR	57	▲
Chinese Taipei	49	▲
Hungary	44	▲
Norway	41	▲
Russian Federation	40	▲
Armenia	39	▲
Latvia	37	▲
Belgium (Flemish)	36	▲
Slovak Republic	36	▲
Estonia	36	▲
Serbia and Montenegro	35	▲
Romania	34	▲
Bulgaria	34	▲
Israel	32	▲
Moldova, Republic of	32	O
Malaysia	32	▲
Netherlands	28	O
New Zealand	28	O
International average	**28**	
Lithuania	27	O
Macedonia, Republic of	26	O
Australia	26	O
Lebanon	26	O
Italy	25	O
Slovenia	25	O
England	23	▼
United States	22	▼
Cyprus	21	▼
Sweden	20	▼
Tunisia	18	▼
Scotland	17	▼
Palestinian Nat'l Auth.	16	▼
Indonesia	16	▼
Bahrain	16	▼
Egypt	15	▼
Jordan	13	▼
Morocco	11	▼
Philippines	11	▼
Iran, Islamic Republic of	11	▼
Chile	10	▼
Botswana	9	▼
Saudi Arabia	6	▼
South Africa	4	▼

Country average vs. International average:	
Higher	▲
Not different	O
Lower	▼

Measure of angle in adjacent angles (continued)

Item Number: M022202

Student Responses

Correct Response:

In the figure, the measure of ∠POR is 110°, the measure of ∠QOS is 90°, and the measure of ∠POS is 140°.
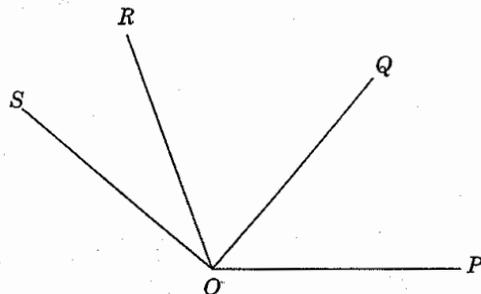
What is the measure of ∠QOR?

Answer: ___ 60° ___

Incorrect Response:

In the figure, the measure of ∠POR is 110°, the measure of ∠QOS is 90°, and the measure of ∠POS is 140°.

What is the measure of ∠QOR?

Answer: ___ 50° ___

Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Lines and Angles	Solving Routine Problems

Sum of angles from intersecting lines

In the figure, PQ and RS are intersecting straight lines.

What is the value of $x + y$?

Ⓐ   15

Ⓑ   30

Ⓒ   60

Ⓓ   180
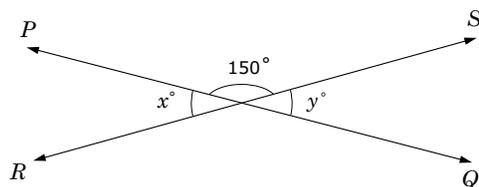
Ⓔ   300

Item Number: M012039

Overall Percent Correct

Korea, Republic of	84	▲
Singapore	84	▲
Hong Kong, SAR	83	▲
Chinese Taipei	82	▲
Japan	78	▲
Malaysia	69	▲
Estonia	67	▲
Latvia	66	▲
Russian Federation	64	▲
Belgium (Flemish)	59	▲
Serbia and Montenegro	59	▲
Israel	58	▲
Romania	58	▲
Slovenia	58	▲
Bulgaria	57	▲
Netherlands	57	▲
Lebanon	55	▲
Lithuania	54	O
Australia	52	O
Moldova, Republic of	52	O
Slovak Republic	52	O
England	50	O
International average	**50**	
Italy	50	O
Hungary	48	O
Iran, Islamic Republic of	48	O
United States	47	O
Cyprus	46	▼
New Zealand	46	O
Macedonia, Republic of	45	▼
Armenia	44	▼
Egypt	43	▼
Sweden	43	▼
Scotland	41	▼
Tunisia	41	▼
Jordan	40	▼
Palestinian Nat'l Auth.	40	▼
Indonesia	38	▼
Norway	34	▼
Bahrain	33	▼
Morocco	33	▼
Chile	32	▼
Philippines	27	▼
Botswana	26	▼
Saudi Arabia	26	▼
Ghana	21	▼
South Africa	16	▼

Correct Response:	C

Country average vs. International average:

Higher	▲
Not different	O
Lower	▼

Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Locations and Spatial Relationships	Knowing Facts and Procedures

Point on a line defined by two points

A straight line passes through the points (2,3) and (4,7). Which of these points is also on the line?

- Ⓐ (0,2)
- Ⓑ (1,2)
- Ⓒ (2,4)
- Ⓓ (3,5)
- Ⓔ (4,5)

Item Number: M022016

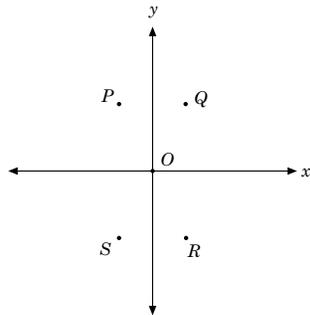**Correct Response:** | **D**

Overall Percent Correct

Country		
Netherlands	66	▲
England	62	▲
Scotland	56	▲
Korea, Republic of	56	▲
Singapore	56	▲
Chinese Taipei	54	▲
Sweden	53	▲
Australia	51	▲
United States	51	▲
Japan	50	▲
Norway	49	▲
Hong Kong, SAR	47	▲
Hungary	46	▲
Lithuania	44	▲
New Zealand	44	▲
Belgium (Flemish)	43	▲
Russian Federation	42	▲
Estonia	40	▲
Malaysia	38	O
Latvia	37	O
Cyprus	36	O
International average	**35**	
Slovenia	35	O
Israel	34	O
Serbia and Montenegro	31	O
Indonesia	31	▼
Slovak Republic	30	▼
Chile	29	▼
Egypt	28	▼
Morocco	28	▼
Romania	28	▼
Macedonia, Republic of	27	▼
Italy	26	▼
Jordan	26	▼
Moldova, Republic of	25	▼
Bulgaria	24	▼
Armenia	23	▼
Lebanon	23	▼
Botswana	22	▼
Philippines	22	▼
Palestinian Nat'l Auth.	21	▼
Bahrain	21	▼
Iran, Islamic Republic of	20	▼
Ghana	19	▼
Saudi Arabia	19	▼
South Africa	19	▼
Tunisia	8	▼

Country average vs. International average:

Higher	▲
Not different	O
Lower	▼

Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Locations and Spatial Relationships	Knowing Facts and Procedures

Which point could have coordinates (2, -4)

In the coordinate plane above, which point could have coordinates (2,–4)?

Ⓐ   *P*

Ⓑ   *Q*

Ⓒ   *R*

Ⓓ   *S*

Item Number: M032588

Correct Response:	**C**

Overall Percent Correct

Chinese Taipei	87	▲
Japan	86	▲
Korea, Republic of	83	▲
Estonia	81	▲
Russian Federation	79	▲
Singapore	77	▲
Netherlands	75	▲
Hong Kong, SAR	74	▲
Hungary	74	▲
Lithuania	73	▲
Latvia	72	▲
United States	72	▲
Malaysia	71	▲
Iran, Islamic Republic of	69	▲
Belgium (Flemish)	68	▲
England	67	▲
Lebanon	66	▲
Scotland	65	▲
Israel	62	▲
Serbia and Montenegro	61	▲
Bulgaria	60	O
Romania	59	O
Slovenia	58	O
Macedonia, Republic of	58	O
New Zealand	58	O
Australia	58	O
Italy	57	O
International average	**56**	
Jordan	55	O
Armenia	53	O
Moldova, Republic of	53	O
Indonesia	53	O
Egypt	47	▼
Sweden	45	▼
Slovak Republic	43	▼
Norway	43	▼
Philippines	41	▼
Bahrain	38	▼
Palestinian Nat'l Auth.	34	▼
Saudi Arabia	32	▼
Morocco	31	▼
Cyprus	30	▼
Tunisia	28	▼
South Africa	28	▼
Botswana	26	▼
Chile	25	▼
Ghana	19	▼

Country average vs. International average:

Higher	▲
Not different	O
Lower	▼

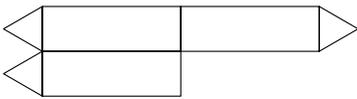| Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Locations and Spatial Relationships	Using Concepts

Which could be folded to make a 3-D figure
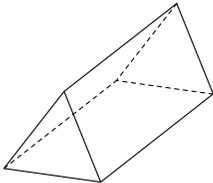
Which of these could be folded to make a shape like the 3-D figure above?

Ⓐ

Ⓑ

Ⓒ

Ⓓ
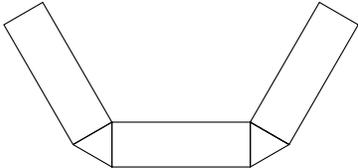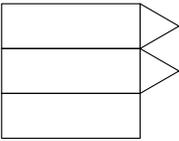
Item Number: M032489

Correct Response: D

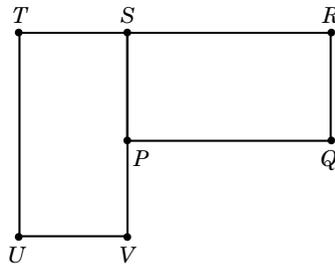| Overall Percent Correct		
Japan	97	▲
Chinese Taipei	96	▲
Korea, Republic of	94	▲
Hong Kong, SAR	94	▲
Singapore	94	▲
Netherlands	89	▲
Malaysia	89	▲
New Zealand	88	▲
Estonia	87	▲
Belgium (Flemish)	87	▲
Australia	86	▲
England	86	▲
Scotland	86	▲
Hungary	85	▲
Lithuania	83	▲
Slovak Republic	81	▲
Serbia and Montenegro	77	▲
United States	76	▲
Sweden	76	▲
Slovenia	75	▲
Italy	73	▲
Latvia	72	O
Norway	71	O
Bulgaria	70	O
Russian Federation	69	O
Indonesia	68	O
International average	**68**	
Romania	68	O
Chile	67	O
Cyprus	63	▼
Macedonia, Republic of	63	▼
Israel	62	▼
Morocco	61	▼
Lebanon	59	▼
Tunisia	58	▼
Iran, Islamic Republic of	55	▼
Jordan	52	▼
Palestinian Nat'l Auth.	51	▼
Moldova, Republic of	49	▼
Bahrain	46	▼
Philippines	46	▼
Botswana	43	▼
Saudi Arabia	40	▼
Armenia	40	▼
Egypt	31	▼
South Africa	28	▼
Ghana	24	▼

Country average vs. International average:	
Higher	▲
Not different	O
Lower	▼

Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Symmetry and Transformations	Reasoning

Center point of rotation of rectangle

Rectangle *PQRS* can be rotated (turned) onto rectangle *UVST*.

What point is the center of rotation?

(A) *P*

(B) *R*

(C) *S*

(D) *T*

(E) *V*

Item Number: M022154

Overall Percent Correct

Japan	79	▲
Chinese Taipei	76	▲
Korea, Republic of	75	▲
Hong Kong, SAR	73	▲
Slovenia	71	▲
Estonia	71	▲
Netherlands	65	▲
Singapore	64	▲
Hungary	63	▲
England	63	▲
Belgium (Flemish)	62	▲
Latvia	61	▲
Sweden	60	▲
New Zealand	59	▲
Lithuania	58	▲
Italy	58	▲
Slovak Republic	54	▲
Australia	54	▲
Israel	54	▲
Malaysia	54	▲
Russian Federation	52	▲
Serbia and Montenegro	50	O
Norway	49	O
United States	49	O
International average	**47**	
Bulgaria	47	O
Moldova, Republic of	46	O
Romania	46	O
Scotland	45	O
Jordan	44	O
Armenia	40	▼
Cyprus	39	▼
Iran, Islamic Republic of	37	▼
Palestinian Nat'l Auth.	34	▼
Bahrain	34	▼
Lebanon	32	▼
Egypt	31	▼
Indonesia	29	▼
Tunisia	29	▼
Macedonia, Republic of	28	▼
Morocco	28	▼
Chile	28	▼
Philippines	25	▼
Botswana	23	▼
Saudi Arabia	18	▼
South Africa	18	▼
Ghana	13	▼

Correct Response:	**C**

Country average vs. International average:

Higher	▲
Not different	O
Lower	▼

Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Symmetry and Transformations	Reasoning

Geometry tiling: produce a pattern using letters
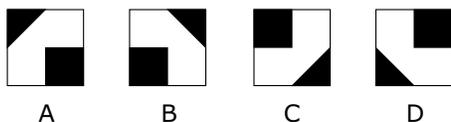
A   B   C   D

Continue to identify the tiles as shown above. On the grid below, write the letters A, B, C, or D to make a symmetrical pattern where *PQ* and *RS* would be lines of symmetry. Arrange the tiles to make a pattern.
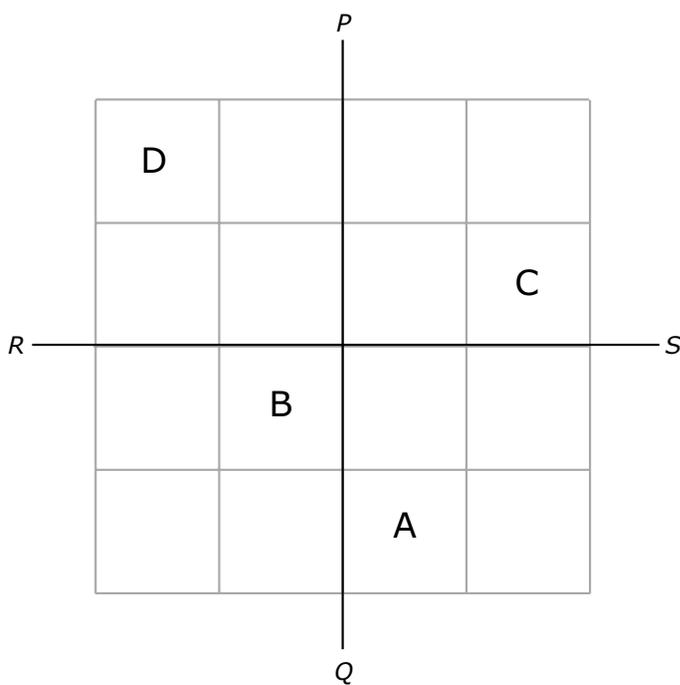
Item Number: M032745

SCORING

Correct Response

- All cells are correct with symmetrical geometric pattern about both axes, PQ and RS (letters or drawings).

Partial Response

- With respect to at least one of the original tiles the other three tiles are correct.

Incorrect Response

- Letters placed symmetrically with respect to both PQ and RS.
- Other incorrect (including crossed out/erased, stray marks, illegible, or off task).

Overall Percent Correct

Lithuania	16	▲
Japan	14	▲
Korea, Republic of	12	▲
Singapore	11	▲
Hong Kong, SAR	10	▲
Scotland	9	▲
England	9	▲
Chinese Taipei	9	▲
Netherlands	8	▲
Slovenia	8	▲
Estonia	7	▲
Australia	7	O
New Zealand	7	O
Belgium (Flemish)	7	▲
United States	6	O
Morocco	5	O
Russian Federation	5	O
Malaysia	5	O
International average	**4**	
Hungary	4	O
Slovak Republic	3	O
Latvia	3	O
Norway	3	O
Moldova, Republic of	3	O
Sweden	3	O
Indonesia	2	▼
Romania	2	▼
Israel	2	▼
Bulgaria	2	▼
Italy	1	▼
Armenia	1	▼
Lebanon	1	▼
Macedonia, Republic of	1	▼
South Africa	1	▼
Egypt	1	▼
Chile	1	▼
Philippines	1	▼
Iran, Islamic Republic of	1	▼
Botswana	1	▼
Jordan	1	▼
Bahrain	1	▼
Cyprus	0	▼
Serbia and Montenegro	0	▼
Tunisia	0	▼
Palestinian Nat'l Auth.	0	▼

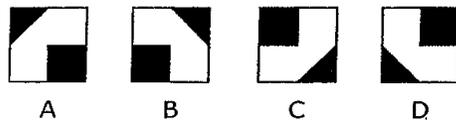| Country average vs. International average:	
Higher	▲
Not different	O
Lower	▼

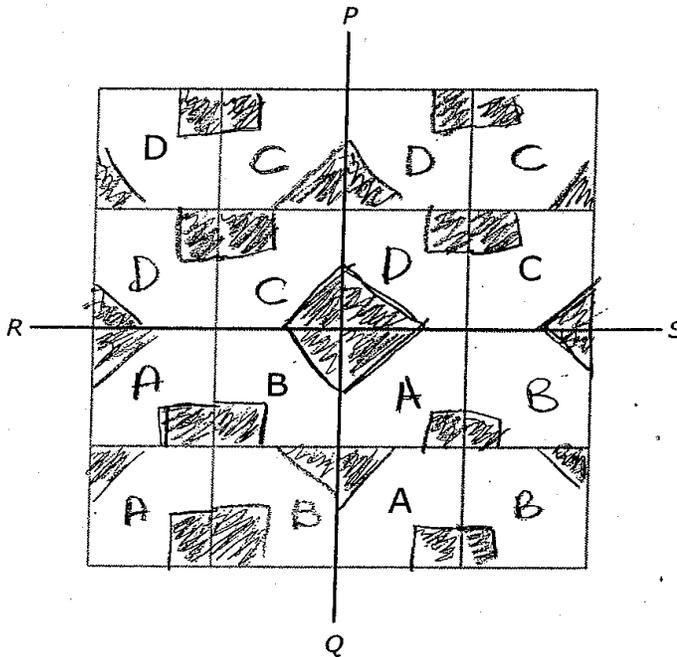Geometry tiling: produce a pattern using letters (continued)

Item Number: M032745

Student Responses

Correct Response:

A   B   C   D

Continue to identify the tiles as shown above. On the grid below, write the letters A, B, C, or D to make a symmetrical pattern where PQ and RS would be lines of symmetry. Arrange the tiles to make a pattern.

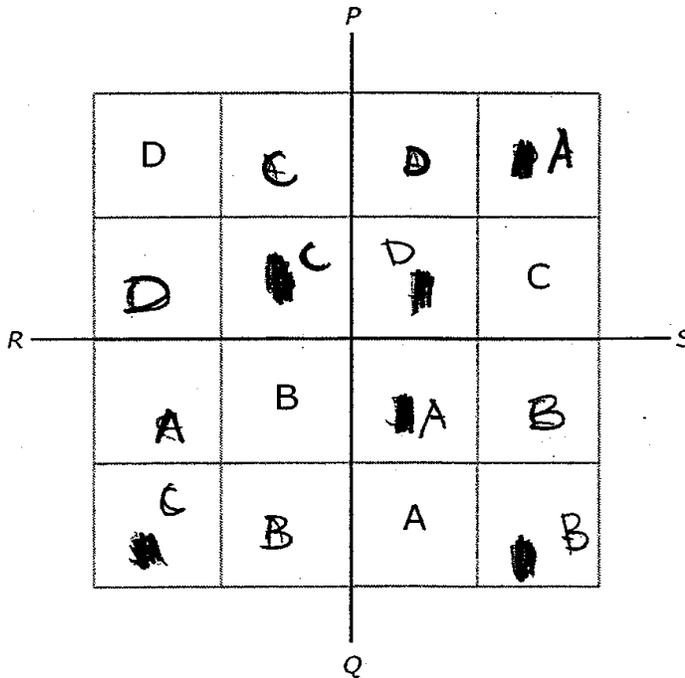Geometry tiling: produce a pattern using letters (continued)

Item Number: M032745

Student Responses (Continued)

Partial Response:

A   B   C   D

Continue to identify the tiles as shown above. On the grid below, write the letters A, B, C, or D to make a symmetrical pattern where *PQ* and *RS* would be lines of symmetry. Arrange the tiles to make a pattern.

Geometry tiling: produce a pattern using letters (continued)

Item Number: M032745

Student Responses (Continued)

Incorrect Response:

A   B   C   D

Continue to identify the tiles as shown above. On the grid below, write the letters A, B, C, or D to make a symmetrical pattern where *PQ* and *RS* would be lines of symmetry. Arrange the tiles to make a pattern.
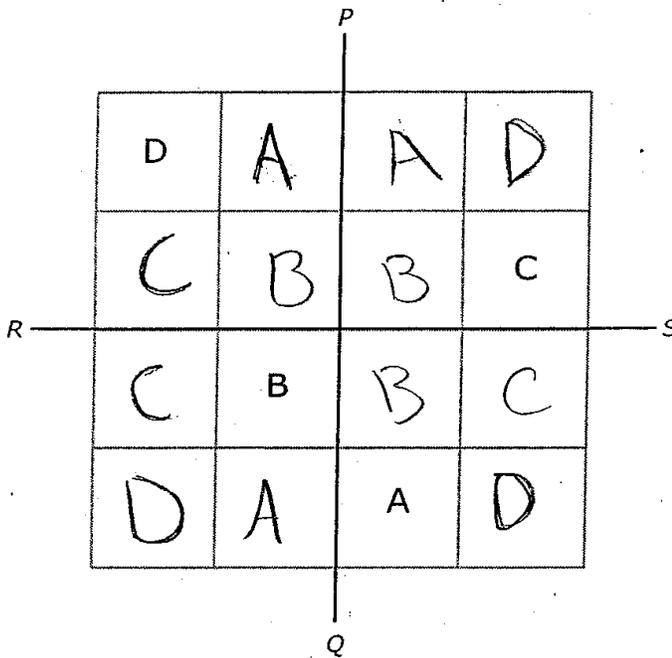
Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Symmetry and Transformations	Using Concepts

Geometry tiling: makes a symmetrical pattern

There are several ways of arranging the tiles so that they form patterns. The grid below has been shaded to show how tiles can be placed on some of the squares. The pattern can be continued so that *AB* and *CD* are lines of symmetry.
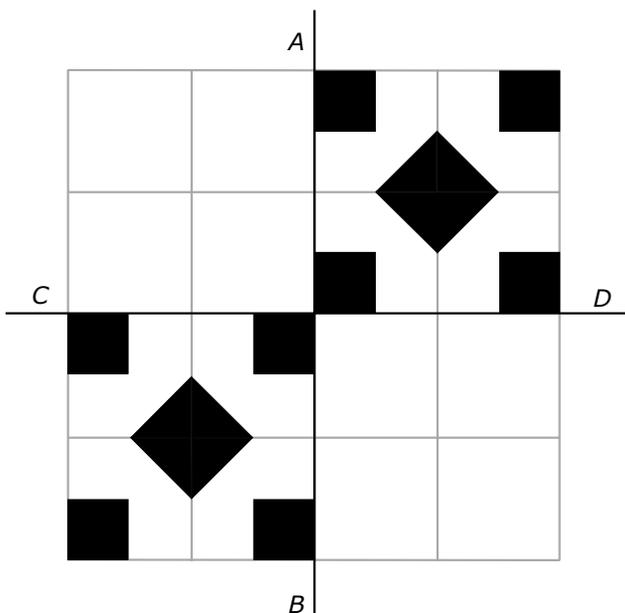
Shade in all the remaining squares on the grid so that the resulting pattern is symmetrical about line *AB*, and also is symmetrical about line *CD*.

Item Number: M032743

SCORING

Correct Response

• Both quadrants correctly shaded (pattern shaded or demarcated in some way making symmetrical pattern about both axes, AB and CD).

Incorrect Response

• One of the two quadrants correctly shaded.

• Incorrect (including crossed out/erased, stray marks, illegible, or off task).

Overall Percent Correct

Scotland	85	▲
Netherlands	82	▲
Korea, Republic of	82	▲
New Zealand	80	▲
England	80	▲
Singapore	77	▲
Australia	76	▲
Hong Kong, SAR	75	▲
Hungary	69	▲
Japan	68	▲
Chinese Taipei	68	▲
United States	67	▲
Belgium (Flemish)	65	▲
Lithuania	63	▲
Slovenia	60	▲
Latvia	60	▲
Jordan	59	▲
Malaysia	56	▲
Slovak Republic	54	O
Russian Federation	53	O
Cyprus	51	O
Estonia	50	O
Italy	50	O
International average	**49**	
Bulgaria	48	O
Norway	46	O
Sweden	46	O
Romania	44	O
Bahrain	43	▼
Israel	42	▼
Serbia and Montenegro	41	▼
Palestinian Nat'l Auth.	41	▼
Indonesia	39	▼
Morocco	38	▼
Iran, Islamic Republic of	34	▼
Saudi Arabia	34	▼
Philippines	34	▼
Egypt	31	▼
Tunisia	25	▼
Macedonia, Republic of	25	▼
Botswana	20	▼
Lebanon	18	▼
South Africa	17	▼
Armenia	13	▼
Chile	13	▼
Moldova, Republic of	1	▼

Country average vs. International average:

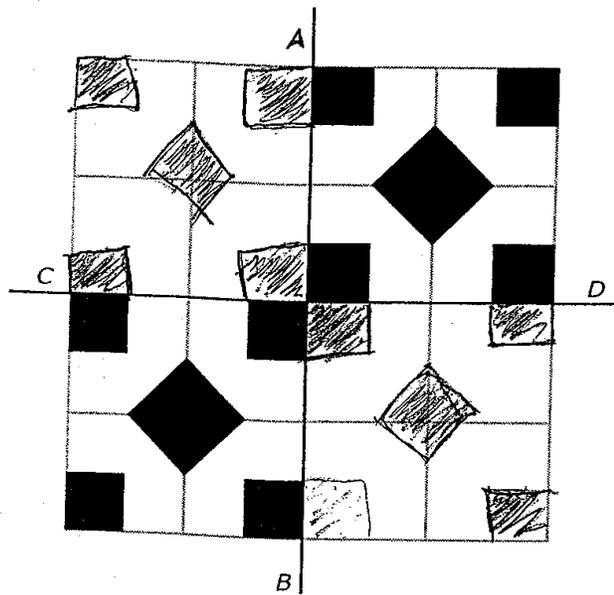|	
Higher	▲
Not different	O
Lower	▼

Geometry tiling: makes a symmetrical pattern (continued)

Item Number: M032743

Student Responses

Correct Response:

There are several ways of arranging the tiles so that they form patterns. The grid below has been shaded to show how tiles can be placed on some of the squares. The pattern can be continued so that *AB* and *CD* are lines of symmetry.

Shade in all the remaining squares on the grid so that the resulting pattern is symmetrical about line *AB*, and also is symmetrical about line *CD*.
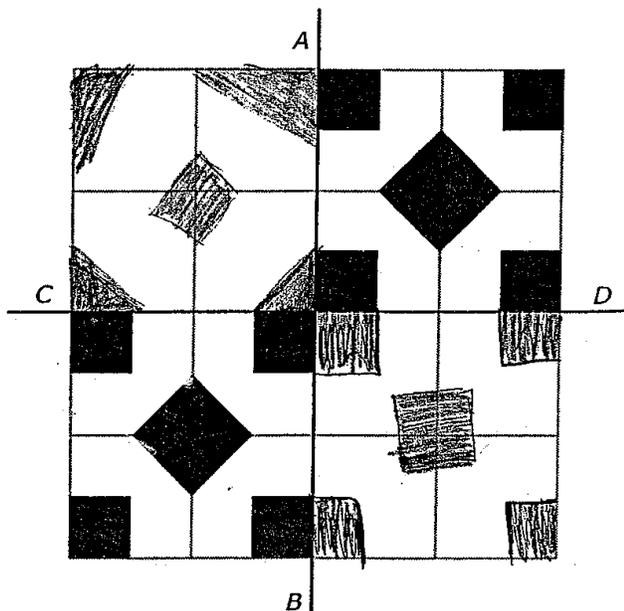
Geometry tiling: makes a symmetrical pattern (continued)

Item Number: M032743

Student Responses (continued)

Incorrect Response:

There are several ways of arranging the tiles so that they form patterns. The grid below has been shaded to show how tiles can be placed on some of the squares. The pattern can be continued so that *AB* and *CD* are lines of symmetry.
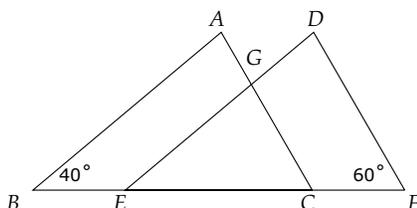

Shade in all the remaining squares on the grid so that the resulting pattern is symmetrical about line *AB*, and also is symmetrical about line *CD*.

Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Two- and Three-Dimensional Shapes	Solving Routine Problems

Angle in overlapping congruent triangles

In this figure, triangles *ABC* and *DEF* are congruent with *BC* = *EF* .

What is the measure of angle *EGC* ?

Ⓐ 20°

Ⓑ 40°

Ⓒ 60°

Ⓓ 80°

Ⓔ 100°

Item Number: M012026

Overall Percent Correct

Country		
Korea, Republic of	84	▲
Hong Kong, SAR	81	▲
Japan	80	▲
Singapore	79	▲
Chinese Taipei	73	▲
Estonia	67	▲
Belgium (Flemish)	66	▲
Latvia	63	▲
Bulgaria	60	▲
Israel	57	▲
Russian Federation	55	▲
Lebanon	55	▲
Scotland	54	▲
Slovak Republic	54	▲
Lithuania	51	▲
Hungary	50	O
Australia	47	O
England	47	O
Egypt	47	O
Malaysia	47	O
International average	**45**	
Armenia	45	O
Moldova, Republic of	45	O
Cyprus	44	O
Netherlands	44	O
Serbia and Montenegro	43	O
New Zealand	42	O
Jordan	42	O
Italy	42	O
Tunisia	41	▼
Bahrain	41	▼
Sweden	40	▼
Palestinian Nat'l Auth.	39	▼
Iran, Islamic Republic of	37	▼
Slovenia	37	▼
United States	36	▼
Macedonia, Republic of	33	▼
Norway	32	▼
Indonesia	31	▼
Morocco	31	▼
Chile	30	▼
Saudi Arabia	26	▼
South Africa	21	▼
Ghana	20	▼
Botswana	20	▼
Romania	18	▼
Philippines	15	▼

Correct Response:	D

Country average vs. International average:	
Higher	▲
Not different	O
Lower	▼

Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Two- and Three-Dimensional Shapes	Solving Routine Problems

The angle by a regular hexagon
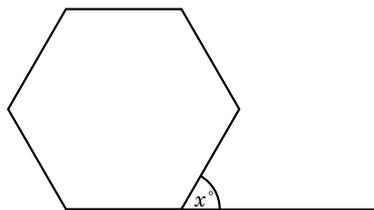
The figure above is a regular hexagon. What is the value of x?

Answer: _____

Item Number: M032693

SCORING

Correct Response

• 60 degrees

Incorrect Response

• 120 degrees

• Other incorrect (including crossed out/erased, stray marks, illegible, or off task).

Overall Percent Correct

Japan	73	▲
Chinese Taipei	70	▲
Korea, Republic of	68	▲
Hong Kong, SAR	64	▲
Singapore	62	▲
Hungary	59	▲
Slovenia	52	▲
Norway	50	▲
Serbia and Montenegro	46	▲
Romania	45	▲
Belgium (Flemish)	45	▲
Slovak Republic	43	▲
Armenia	42	▲
Russian Federation	42	▲
Netherlands	40	▲
Macedonia, Republic of	39	▲
Moldova, Republic of	39	▲
Estonia	37	O
Latvia	33	O
Malaysia	33	O
International average	**33**	
Italy	32	O
Bulgaria	32	O
Lithuania	31	O
England	30	O
Tunisia	29	▼
Lebanon	28	▼
New Zealand	27	▼
Australia	27	▼
Israel	26	▼
Sweden	24	▼
Iran, Islamic Republic of	24	▼
Jordan	23	▼
Palestinian Nat'l Auth.	23	▼
Egypt	23	▼
Scotland	23	▼
Bahrain	22	▼
Saudi Arabia	21	▼
United States	20	▼
Cyprus	19	▼
Indonesia	17	▼
Ghana	16	▼
Botswana	14	▼
Chile	9	▼
Morocco	9	▼
Philippines	6	▼
South Africa	5	▼

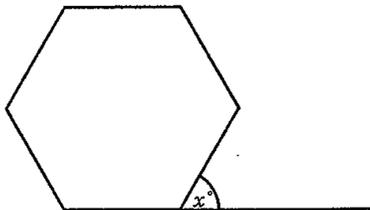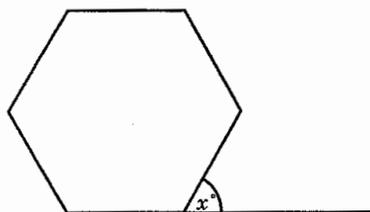| Country average vs. International average:	
Higher	▲
Not different	O
Lower	▼

The angle by a regular hexagon (continued)

Item Number: M032693

Student Responses
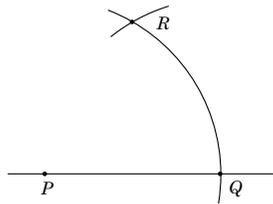
Correct Response:

The figure above is a regular hexagon. What is the value of x?

Answer: ___60°___

Incorrect Response:

The figure above is a regular hexagon. What is the value of x?

Answer: ___55°___

Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Two- and Three-Dimensional Shapes	Using Concepts

The size of angle *PRQ*

In the figure above, an arc of a circle with center *P* has been drawn to cut the line at *Q*. Then an arc with the same radius and center *Q* was drawn to cut the first arc at *R*. What would be the size of angle *PRQ*?

(A) 30°

(B) 45°

(C) 60°

(D) 75°

Item Number: M032689

Correct Response: **C**

Overall Percent Correct

Korea, Republic of	70	▲
Chinese Taipei	70	▲
Hungary	69	▲
Tunisia	66	▲
Japan	64	▲
Malaysia	62	▲
Hong Kong, SAR	59	▲
Norway	58	▲
Slovak Republic	58	▲
Lebanon	58	▲
Serbia and Montenegro	58	▲
Estonia	56	▲
Belgium (Flemish)	54	▲
Slovenia	52	▲
Russian Federation	51	O
Romania	51	O
Macedonia, Republic of	50	O
Singapore	49	▲
Bulgaria	48	O
Latvia	46	O
International average	**46**	
New Zealand	45	O
Moldova, Republic of	44	O
Netherlands	44	O
Saudi Arabia	43	O
Lithuania	43	O
Palestinian Nat'l Auth.	42	O
England	42	O
Italy	41	▼
Morocco	40	▼
Jordan	39	▼
Ghana	38	▼
Egypt	38	▼
Chile	37	▼
Australia	37	▼
Armenia	36	▼
Iran, Islamic Republic of	36	▼
Scotland	35	▼
Sweden	35	▼
Bahrain	35	▼
Israel	34	▼
United States	34	▼
Botswana	34	▼
Cyprus	34	▼
Indonesia	32	▼
South Africa	29	▼
Philippines	25	▼

Country average vs. International average:

Higher	▲
Not different	O
Lower	▼