

Content Domain	Main Topic	Cognitive Domain
PATTERNS AND RELATIONSHIPS	Equations and Formulas	Solving Routine Problems

Symbolic linear equation of magazines

represents the number of magazines that Lina reads each week.
Which of these represents the total number of magazines that Lina reads in 6 weeks?

(A) $6 + \square$

(B) $6 \times \square$

(C) $\square + 6$

(D) $(\square + \square) \times 6$

Overall Percent Correct

Singapore	86	▲
Chinese Taipei	81	▲
Hong Kong, SAR	76	▲
Netherlands	72	▲
United States	72	▲
Japan	67	▲
Belgium (Flemish)	67	▲
Latvia	66	▲
Russian Federation	66	▲
England	66	▲
Cyprus	65	▲
Moldova, Republic of	64	▲
Lithuania	62	○
Hungary	61	○
Slovenia	60	○
Scotland	60	○
International average	58	
Australia	56	○
New Zealand	54	▼
Italy	50	▼
Armenia	46	▼
Philippines	38	▼
Norway	37	▼
Iran, Islamic Republic of	34	▼
Morocco	29	▼
Tunisia	20	▼

Country average vs.
International average:

Higher	▲
Not different	○
Lower	▼

Item Number: M012048

Correct Response:	B
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Content Domain	Main Topic	Cognitive Domain
PATTERNS AND RELATIONSHIPS	Equations and Formulas	Using Concepts

Rob sold some of his apples

Rob had 50 apples. He sold some and then had 20 left.
Which of these is a number sentence that shows this?

- (A) $\square - 20 = 50$
 (B) $20 - \square = 50$
 (C) $\square - 50 = 20$
 (D) $50 - \square = 20$

Overall Percent Correct

Chinese Taipei	89	▲
Japan	89	▲
Singapore	89	▲
Hong Kong, SAR	87	▲
Hungary	87	▲
Lithuania	87	▲
Russian Federation	87	▲
United States	84	▲
Cyprus	83	▲
Latvia	83	▲
Moldova, Republic of	81	▲
Belgium (Flemish)	81	▲
Slovenia	78	▲
England	78	▲
Netherlands	76	○
Australia	74	○
New Zealand	74	○
International average	73	
Scotland	72	○
Armenia	70	○
Italy	67	▼
Norway	59	▼
Iran, Islamic Republic of	54	▼
Philippines	52	▼
Morocco	33	▼
Tunisia	21	▼

Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

Item Number: M031220

Correct Response:

D

Content Domain	Main Topic	Cognitive Domain
PATTERNS AND RELATIONSHIPS	Equations and Formulas	Using Concepts

The value of 37 times box plus 6

$37 \times \blacksquare = 703$.
What is the value of $37 \times \blacksquare + 6$?

Answer: _____

Overall Percent Correct

Hong Kong, SAR	48	▲
Russian Federation	35	▲
Belgium (Flemish)	29	▲
Netherlands	27	▲
Japan	26	▲
Chinese Taipei	24	▲
Lithuania	23	▲
Singapore	23	▲
Armenia	22	▲
Italy	21	○
Latvia	21	▲
Hungary	19	○
Cyprus	17	○
Moldova, Republic of	17	○
International average	17	
Australia	10	○
Scotland	10	▼
Slovenia	9	▼
England	9	▼
New Zealand	8	▼
Norway	8	▼
United States	7	▼
Tunisia	5	▼
Philippines	4	▼
Iran, Islamic Republic of	2	▼
Morocco	2	▼

Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

Item Number: M031249

SCORING

Correct Response

- 709 or $703 + 6$

Incorrect Response

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

The value of 37 times box plus 6 (continued)

Item Number: M031249

Student Responses

Correct Response:

$$37 \times \blacksquare = 703.$$

What is the value of $37 \times \blacksquare + 6$?

Answer: 709

Incorrect Response:

$$37 \times \blacksquare = 703.$$

What is the value of $37 \times \blacksquare + 6$?

Answer: 7117

$$\begin{array}{r} 9 \\ 703 \\ \times 37 \\ \hline \end{array}$$

Content Domain	Main Topic	Cognitive Domain
PATTERNS AND RELATIONSHIPS	Patterns	Reasoning

Complete number pattern

Here is a number pattern.

100, 1, 99, 2, 98, , ,

What three numbers should go in the boxes?

Ⓐ 3, 97, 4
 Ⓑ 4, 97, 5
 Ⓒ 97, 3, 96
 Ⓓ 97, 4, 96

Item Number: M011027

Overall Percent Correct

Singapore	94	▲
United States	91	▲
Australia	88	▲
England	88	▲
Chinese Taipei	85	▲
Hong Kong, SAR	83	▲
Japan	83	▲
Belgium (Flemish)	83	▲
New Zealand	82	▲
Lithuania	80	▲
Scotland	79	▲
Cyprus	77	▲
Latvia	73	○
Moldova, Republic of	73	○
Russian Federation	73	▲
Hungary	70	○
Netherlands	70	○
Slovenia	69	○
International average	69	
Italy	58	▼
Philippines	56	▼
Armenia	47	▼
Norway	46	▼
Morocco	28	▼
Iran, Islamic Republic of	27	▼
Tunisia	15	▼

Country average vs.
International average:

Higher	▲
Not different	○
Lower	▼

Correct Response:

A

Content Domain	Main Topic	Cognitive Domain
PATTERNS AND RELATIONSHIPS	Patterns	Solving Routine Problems

The number to go in the center of the table

4	11	6
9		5
8	3	10

The rule for the table is that numbers in each row and column must add up to the same number. What number goes in the center of the table?

- (A) 1
- (B) 2
- (C) 7
- (D) 12

Overall Percent Correct

Hungary	77	▲
Chinese Taipei	75	▲
Japan	72	▲
Singapore	72	▲
Lithuania	70	▲
Hong Kong, SAR	69	▲
Cyprus	68	▲
Latvia	67	▲
Belgium (Flemish)	67	▲
Moldova, Republic of	66	▲
Russian Federation	66	○
England	65	○
Scotland	63	○
New Zealand	61	○
International average	61	
Netherlands	60	○
Australia	59	○
Slovenia	59	○
Italy	58	○
United States	58	▼
Armenia	51	▼
Iran, Islamic Republic of	49	▼
Norway	48	▼
Philippines	43	▼
Tunisia	42	▼
Morocco	41	▼

Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

Item Number: M031023

Correct Response:

C

Content Domain	Main Topic	Cognitive Domain
PATTERNS AND RELATIONSHIPS	Patterns	Solving Routine Problems

The daily start times for a movie

The daily start times for showing a movie are listed below:

Show	Start Time
1st	2:00 p.m.
2nd	3:30 p.m.
3rd	5:00 p.m.
4th	?

If this pattern continues, what is the start time for the 4th show?

- (A) 5:30 p.m.
- (B) 6:00 p.m.
- (C) 6:30 p.m.
- (D) 7:00 p.m.

Overall Percent Correct

Japan	90	▲
Singapore	88	▲
Hong Kong, SAR	86	▲
England	85	▲
Netherlands	83	▲
United States	83	▲
Belgium (Flemish)	81	▲
Australia	77	▲
Chinese Taipei	74	▲
New Zealand	74	▲
Scotland	74	▲
Lithuania	73	▲
Russian Federation	73	▲
Cyprus	72	▲
Hungary	69	○
Italy	68	○
Latvia	68	○
International average	67	
Moldova, Republic of	65	○
Slovenia	60	▼
Philippines	48	▼
Armenia	47	▼
Norway	45	▼
Iran, Islamic Republic of	33	▼
Morocco	31	▼
Tunisia	28	▼

Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

Item Number: M031051

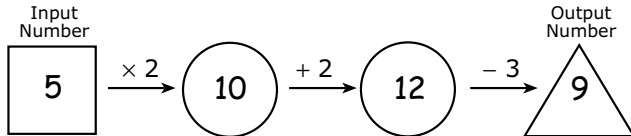
Correct Response:

C

Content Domain	Main Topic	Cognitive Domain
PATTERNS AND RELATIONSHIPS	Relationships	Knowing Facts and Procedures

Output of the number machine

A number machine takes a number and operates on it.
When the Input Number is 5, the Output Number is 9, as shown below.



When the Input Number is 7, which of these is the Output Number?

- (A) 11
- (B) 13
- (C) 14
- (D) 25

Overall Percent Correct

Belgium (Flemish)	72	▲
Hungary	71	▲
Singapore	69	▲
Japan	65	▲
Netherlands	65	▲
England	64	▲
Cyprus	62	▲
Italy	61	▲
Latvia	61	▲
Lithuania	61	▲
Hong Kong, SAR	55	▲
Moldova, Republic of	55	○
Russian Federation	55	○
Chinese Taipei	54	▲
International average	50	
Scotland	49	○
United States	48	○
New Zealand	45	▼
Australia	44	▼
Armenia	41	▼
Slovenia	36	▼
Norway	34	▼
Iran, Islamic Republic of	27	▼
Philippines	24	▼
Morocco	22	▼
Tunisia	18	▼

Country average vs.
International average:

Higher	▲
Not different	○
Lower	▼

Item Number: M031190

Correct Response:

B

Content Domain	Main Topic	Cognitive Domain
DATA	Data Interpretation	Reasoning

Heights of four girls on graph

The graph shows the heights of four girls.

The names are missing from the graph. Debbie is the tallest. Amy is the shortest. Dawn is taller than Sarah. How tall is Sarah?

(A) 75 cm
 (B) 100 cm
 (C) 125 cm
 (D) 150 cm

Item Number: M012126

Overall Percent Correct

Singapore	84	▲
Latvia	83	▲
Belgium (Flemish)	82	▲
Hong Kong, SAR	81	▲
Russian Federation	81	▲
Chinese Taipei	78	▲
United States	78	▲
Japan	76	▲
Lithuania	76	▲
Netherlands	76	▲
Slovenia	76	▲
Australia	74	▲
Italy	74	▲
England	74	▲
Hungary	73	▲
New Zealand	70	○
Cyprus	68	○
International average	67	
Moldova, Republic of	66	○
Norway	63	○
Scotland	63	▼
Armenia	55	▼
Morocco	39	▼
Iran, Islamic Republic of	36	▼
Tunisia	32	▼
Philippines	31	▼

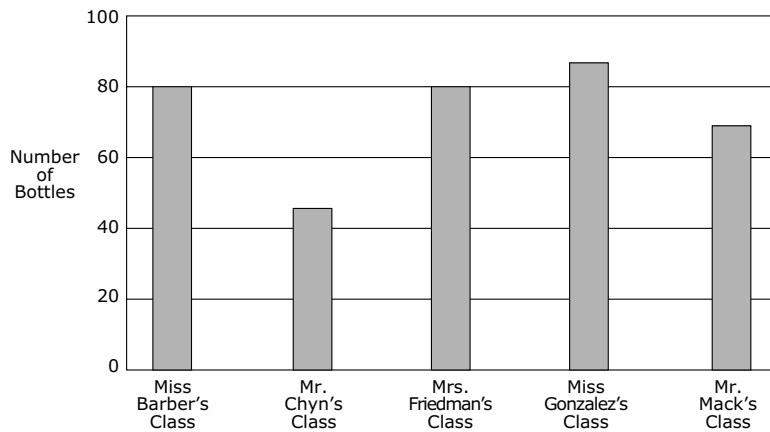
Country average vs. International average:	
Higher	▲
Not different	○
Lower	▼

Correct Response:	B
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Content Domain	Main Topic	Cognitive Domain
DATA	Data Representation	Solving Routine Problems

Bar graph: which shows 45 bottles

Central School had a bottle collection. Children in each class brought empty bottles to school. The principal made a bar graph of the number of bottles from five classes.



Which class collected 45 bottles?

- (A) Miss Barber's class
- (B) Mr. Chyn's class
- (C) Mrs. Friedman's class
- (D) Mr. Mack's class

Item Number: M011009

Overall Percent Correct

Hong Kong, SAR	98	▲
Singapore	98	▲
Chinese Taipei	97	▲
Japan	97	▲
United States	97	▲
England	96	▲
Australia	95	▲
Netherlands	95	▲
Belgium (Flemish)	95	▲
New Zealand	93	▲
Scotland	92	▲
Latvia	90	▲
Lithuania	90	▲
Cyprus	89	▲
Hungary	88	▲
Slovenia	87	▲
Russian Federation	84	○
Norway	83	○
International average	83	
Italy	82	○
Moldova, Republic of	76	▼
Philippines	65	▼
Armenia	53	▼
Morocco	50	▼
Iran, Islamic Republic of	48	▼
Tunisia	32	▼

Country average vs. International average:

- Higher ▲
- Not different ○
- Lower ▼

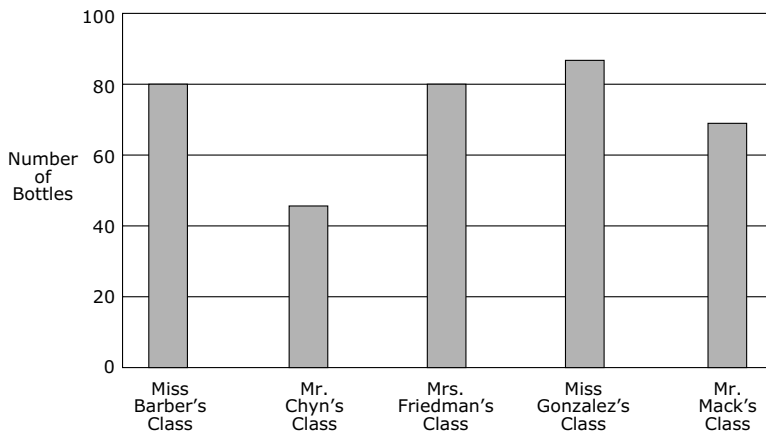
Correct Response:

B

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

Bar graph: which two show 80 bottles

Central School had a bottle collection. Children in each class brought empty bottles to school. The principal made a bar graph of the number of bottles from five classes.



Which two classes collected exactly 80 bottles?

- (A) Miss Barber's and Mrs. Friedman's classes
- (B) Miss Barber's and Mr. Mack's classes
- (C) Mrs. Friedman's and Miss Gonzalez's classes
- (D) Miss Gonzalez's and Mr. Mack's classes

Item Number: M011012

Overall Percent Correct

Hong Kong, SAR	98	▲
Singapore	97	▲
United States	96	▲
Netherlands	92	▲
Belgium (Flemish)	91	▲
Australia	89	▲
Chinese Taipei	88	▲
Slovenia	88	▲
Cyprus	85	▲
Japan	85	▲
Italy	84	▲
New Zealand	84	▲
England	84	▲
Scotland	81	○
Latvia	80	○
Russian Federation	80	○
Hungary	78	○
International average	78	
Norway	76	○
Lithuania	75	○
Moldova, Republic of	75	○
Philippines	64	▼
Armenia	50	▼
Iran, Islamic Republic of	48	▼
Morocco	48	▼
Tunisia	35	▼

Country average vs. International average:

- Higher ▲
- Not different ○
- Lower ▼

Correct Response:

A

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

Highest temperature on chart

This chart shows temperature readings made at different times on four days.

TEMPERATURES					
	6 a.m.	9 a.m.	Noon	3 p.m.	8 p.m.
Monday	15°	17°	20°	21°	19°
Tuesday	15°	15°	15°	10°	9°
Wednesday	8°	10°	14°	13°	15°
Thursday	8°	11°	14°	17°	20°

When was the highest temperature recorded?

- (A) Noon on Monday
 (B) 3 p.m. on Monday
 (C) Noon on Tuesday
 (D) 3 p.m. on Wednesday

Overall Percent Correct

Japan	95	▲
Chinese Taipei	90	▲
Hong Kong, SAR	89	▲
Netherlands	89	▲
Hungary	86	▲
Singapore	85	▲
United States	85	▲
England	85	▲
Belgium (Flemish)	85	▲
Italy	82	▲
Lithuania	81	▲
Scotland	81	▲
Australia	80	▲
Russian Federation	80	▲
Latvia	79	▲
New Zealand	78	▲
Slovenia	76	○
International average	74	
Norway	73	○
Cyprus	70	○
Moldova, Republic of	65	▼
Armenia	53	▼
Philippines	50	▼
Iran, Islamic Republic of	42	▼
Morocco	34	▼
Tunisia	31	▼

Country average vs.
International average:

Higher	▲
Not different	○
Lower	▼

Item Number: M012078

Correct Response:

B

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

Colors of students' hair on the graph

In a class of 30 students, 10 have black hair, 15 have blonde hair, and the rest have brown hair. Complete the graph below to show the number of students with brown hair.

Hair Color	Number of Students
Black	10
Blonde	15
Brown	5

Overall Percent Correct		
Netherlands	93	▲
Belgium (Flemish)	93	▲
Chinese Taipei	92	▲
Hong Kong, SAR	92	▲
Japan	90	▲
Singapore	90	▲
Latvia	88	▲
Lithuania	87	▲
England	86	▲
Hungary	84	▲
Scotland	83	▲
Russian Federation	82	▲
United States	82	▲
Cyprus	80	▲
New Zealand	80	▲
Slovenia	79	▲
Australia	76	○
Norway	75	○
International average	73	
Italy	71	○
Moldova, Republic of	67	▼
Armenia	50	▼
Philippines	29	▼
Iran, Islamic Republic of	28	▼
Morocco	24	▼
Tunisia	21	▼

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

Item Number: M031264

SCORING

Correct Response

- Bar for brown hair drawn to the horizontal line at 5

Incorrect Response

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

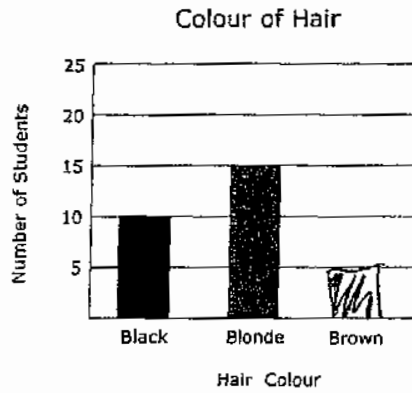
Colors of students' hair on the graph (continued)

Item Number: M031264

Student Responses

Correct Response:

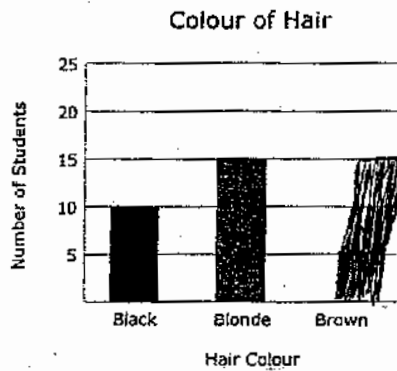
In a class of 30 students, 10 have black hair, 15 have blonde hair, and the rest have brown hair. Complete the bar graph below to show the number of students with brown hair.



Incorrect Response:

In a class of 30 students, 10 have black hair, 15 have blonde hair, and the rest have brown hair.

Complete the graph below to show the number of students with brown hair.



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

How many more pencils than rulers sold

A store owner decided to check how many pens, pencils, erasers, and rulers were sold on the day school opened. He made the tally chart below.

Pens	Pencils	Erasers	Rulers

How many more pencils than rulers were sold?

Answer: _____

Overall Percent Correct

Japan	89	▲
England	73	▲
Belgium (Flemish)	72	▲
Netherlands	70	▲
United States	70	▲
Singapore	69	▲
Australia	66	▲
Scotland	62	▲
New Zealand	60	▲
Norway	55	▲
Latvia	46	▲
Cyprus	44	○
International average	39	
Hong Kong, SAR	36	○
Chinese Taipei	35	○
Lithuania	22	▼
Armenia	18	▼
Philippines	16	▼
Italy	10	▼
Moldova, Republic of	7	▼
Russian Federation	6	▼
Slovenia	5	▼
Tunisia	4	▼
Morocco	3	▼
Iran, Islamic Republic of	2	▼
Hungary	0	▼

Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

Item Number: M031265

SCORING

Correct Response

- 2 more pencils than rulers

Incorrect Response

- 1 more pencil than rulers
- Other incorrect (including crossed out/erased, stray marks, illegible, or off task)

How many more pencils than rulers sold (continued)

Item Number: M031265

Student Responses

Correct Response:

A store owner decided to check how many pens, pencils, erasers, and rulers were sold on the day school opened. He made the tally chart below.

Pens	Pencils	Erasers	Rulers

How many more pencils than rulers were sold?

Answer: TWO

Incorrect Response:

A store owner decided to check how many pens, pencils, erasers, and rulers were sold on the day school opened. He made the tally chart below.

Pens	Pencils	Erasers	Rulers

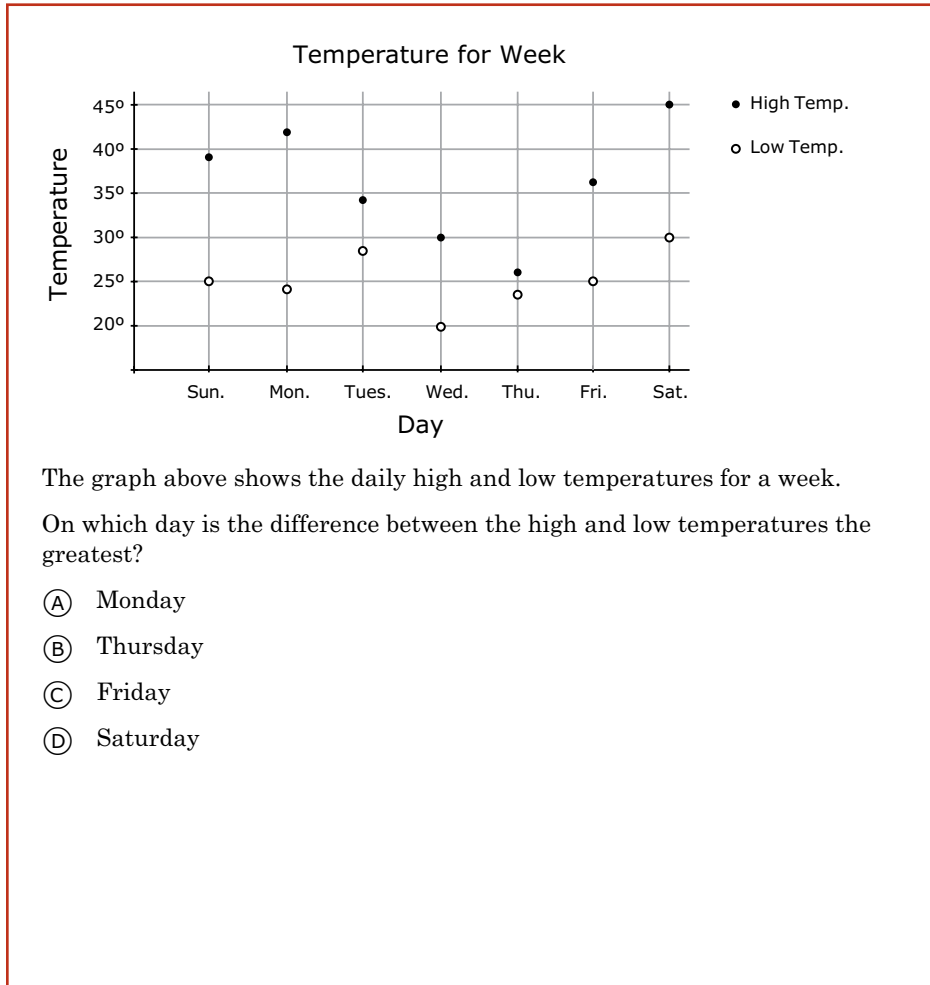
How many more pencils than rulers were sold?

Answer: 26/29

pencils / rulers

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

High and low temperatures for a week



Item Number: M031333

Overall Percent Correct

Japan	73	▲
Hong Kong, SAR	69	▲
Belgium (Flemish)	68	▲
Chinese Taipei	57	▲
Lithuania	56	▲
Netherlands	56	▲
England	53	▲
Latvia	48	○
Singapore	47	▲
Russian Federation	44	○
International average	42	
Hungary	41	○
Cyprus	40	○
Moldova, Republic of	39	○
Scotland	39	○
New Zealand	38	○
Slovenia	38	○
United States	38	▼
Italy	37	○
Australia	34	▼
Norway	32	▼
Philippines	30	▼
Morocco	25	▼
Armenia	22	▼
Iran, Islamic Republic of	16	▼
Tunisia	13	▼

Country average vs.
International average:

Higher	▲
Not different	○
Lower	▼

Correct Response:

A

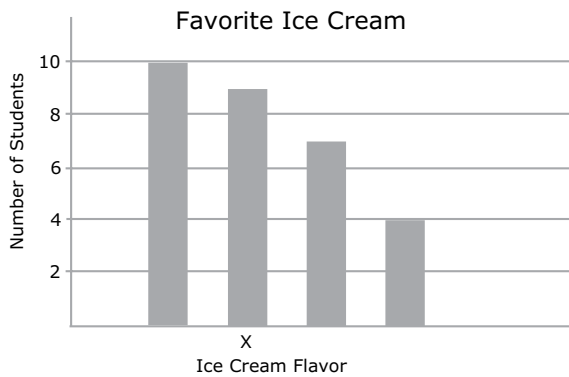
Content Domain	Main Topic	Cognitive Domain
DATA	Data Representation	Using Concepts

The favorite ice creams of 30 students

Favorite Ice Cream	Number of Students
Butterscotch	
Chocolate	### ###
Strawberry	###
Vanilla	###

A teacher asked 30 students in her class the flavor of their favorite ice cream. The table above shows how the teacher recorded the students' responses.

In the bar graph below, which ice cream flavor corresponds to the bar that is labeled X?



- (A) butterscotch
- (B) chocolate
- (C) strawberry
- (D) vanilla

Item Number: M031315

Overall Percent Correct

Japan	90	▲
Singapore	82	▲
England	75	▲
Netherlands	72	▲
United States	69	▲
Hong Kong, SAR	65	▲
Chinese Taipei	61	▲
Scotland	60	▲
New Zealand	59	▲
Belgium (Flemish)	58	▲
Australia	57	▲
Cyprus	53	▲
Latvia	50	○
International average	47	
Hungary	41	▼
Lithuania	37	▼
Norway	36	▼
Russian Federation	33	▼
Italy	30	▼
Moldova, Republic of	25	▼
Philippines	25	▼
Iran, Islamic Republic of	24	▼
Morocco	24	▼
Slovenia	22	▼
Armenia	19	▼
Tunisia	15	▼

Country average vs. International average:

- Higher ▲
- Not different ○
- Lower ▼

Correct Response: C

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

Congruent figures

Figures that are the same size and shape are called congruent figures.

Which two figures are congruent?

(A) 1 and 2
 (B) 1 and 3
 (C) 1 and 4
 (D) 3 and 4

Overall Percent Correct

Latvia	96	▲
Lithuania	95	▲
Slovenia	94	▲
United States	94	▲
Japan	93	▲
Russian Federation	93	▲
Singapore	93	▲
Belgium (Flemish)	93	▲
Chinese Taipei	92	▲
Netherlands	92	▲
Hong Kong, SAR	90	▲
Italy	89	▲
England	89	▲
Scotland	88	○
Australia	87	○
Hungary	87	○
New Zealand	86	○
Norway	86	○
International average	85	
Cyprus	83	○
Moldova, Republic of	83	○
Iran, Islamic Republic of	69	▼
Armenia	68	▼
Morocco	67	▼
Philippines	60	▼
Tunisia	59	▼

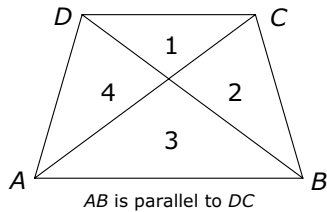
Country average vs. International average:	
Higher	▲
Not different	○
Lower	▼

Item Number: M011014

Correct Response:	C
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Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Congruence and Similarity	Knowing Facts and Procedures

Shade in two triangles of different sizes



Two of the four triangles in the figure above are the same shape but different sizes. Shade in those two triangles.

Overall Percent Correct

Chinese Taipei	66	▲
Japan	63	▲
Singapore	62	▲
United States	57	▲
England	57	▲
Russian Federation	53	▲
Australia	52	▲
Hungary	51	▲
New Zealand	51	▲
Belgium (Flemish)	51	▲
Lithuania	50	▲
Scotland	50	▲
Cyprus	49	▲
Hong Kong, SAR	48	▲
Italy	46	○
Slovenia	45	○
International average	43	
Moldova, Republic of	39	○
Netherlands	39	○
Latvia	28	▼
Armenia	26	▼
Iran, Islamic Republic of	24	▼
Norway	23	▼
Philippines	17	▼
Morocco	13	▼
Tunisia	11	▼

Country average vs. International average:

- Higher ▲
- Not different ○
- Lower ▼

Item Number: M031267

SCORING

Correct Response

- Triangles 1 and 3

Incorrect Response

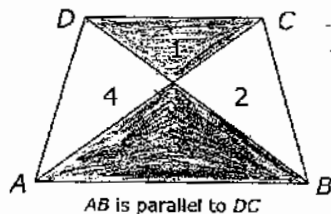
- Triangles 2 and 4
- Triangles 1 and 2; Triangles 3 and 4; Triangles 1 and 4; OR Triangles 2 and 3
- Other incorrect (including crossed out/erased, stray marks, illegible, or off task)

Shade in two triangles of different sizes (continued)

Item Number: M031267

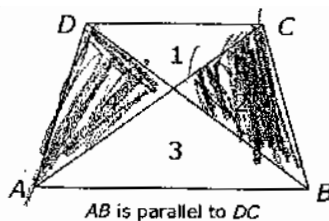
Student Responses

Correct Response:



Two of the four triangles in the figure above are the same shape but different sizes. Shade in those two triangles.

Incorrect Response:

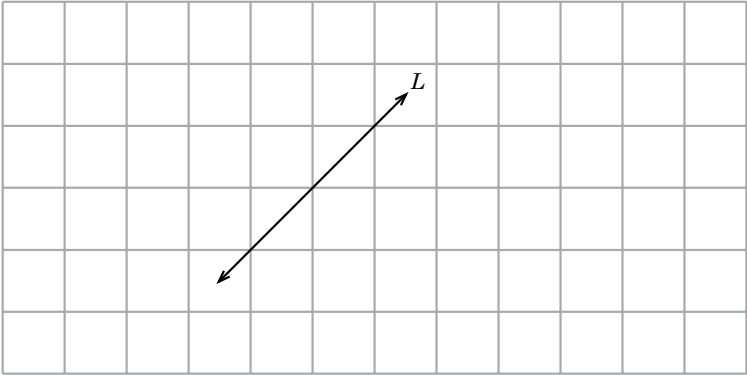


Two of the four triangles in the figure above are the same shape but different sizes. Shade in those two triangles.

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

Draw a line on the grid parallel to line L .

On the grid, draw a line parallel to line L .



Item Number: M031327

SCORING

Correct Response

- Line (or lines) parallel to L

Incorrect Response

- Line perpendicular to L shown
- Other incorrect (including crossed out/erased, stray marks, illegible, or off task)

Overall Percent Correct

Singapore	94	▲
Belgium (Flemish)	91	▲
Moldova, Republic of	74	▲
United States	72	▲
Italy	69	▲
Hong Kong, SAR	63	▲
Chinese Taipei	58	▲
Hungary	58	▲
England	56	○
Armenia	51	○
Iran, Islamic Republic of	50	○
International average	50	
Russian Federation	48	○
Australia	47	○
Japan	46	▼
Cyprus	43	▼
New Zealand	42	▼
Lithuania	40	▼
Morocco	36	▼
Norway	36	▼
Latvia	34	▼
Slovenia	34	▼
Philippines	33	▼
Netherlands	32	▼
Tunisia	29	▼
Scotland	22	▼

Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

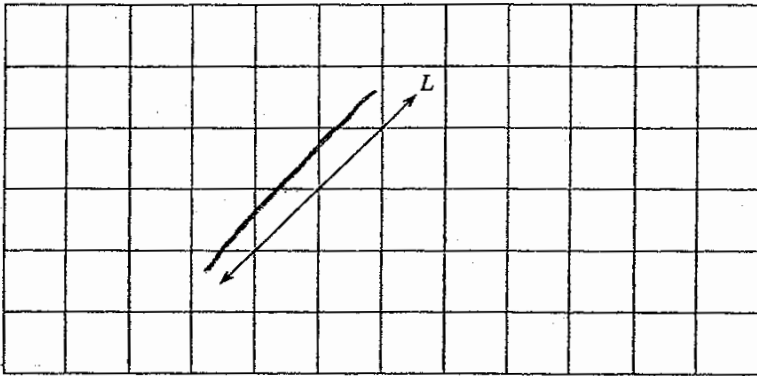
Draw a line on the grid parallel to line L (continued)

Item Number: M031327

Student Responses

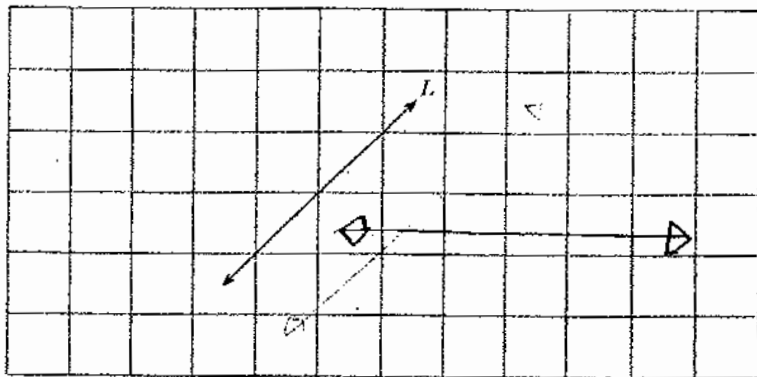
Correct Response:

On the grid, draw a line parallel to line L.



Incorrect Response:

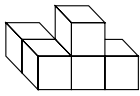
On the grid, draw a line parallel to line L.



Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Locations and Spatial Relationships	Reasoning

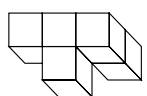
Rotated 3-dimensional figure

This figure will be turned to a different position.

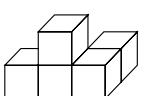


Which of these could be the figure after it is turned?

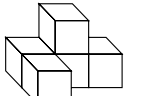
Ⓐ



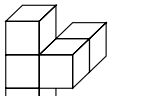
Ⓑ



Ⓒ



Ⓓ



Overall Percent Correct

Norway	60	▲
Latvia	59	▲
Chinese Taipei	57	▲
Singapore	54	▲
Belgium (Flemish)	52	▲
Slovenia	51	▲
Hungary	50	▲
Italy	49	▲
Japan	49	▲
Scotland	49	▲
England	46	○
New Zealand	45	○
Hong Kong, SAR	43	○
International average	43	
Australia	42	○
Russian Federation	41	○
Netherlands	40	○
Moldova, Republic of	39	○
United States	39	▼
Tunisia	35	▼
Armenia	34	▼
Lithuania	32	▼
Cyprus	31	▼
Iran, Islamic Republic of	26	▼
Philippines	23	▼
Morocco	20	▼

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

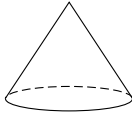
Item Number: M012069

Correct Response:	A
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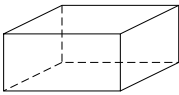
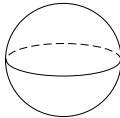
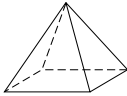
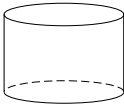
Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Two- and Three-Dimensional Shapes	Knowing Facts and Procedures

Which has flat and curved surface

Here is a cone. Part of its surface is flat and part of its surface is curved.



Which of these solids also has both a flat surface and a curved surface?

(A)  (B)  (C)  (D) 

Overall Percent Correct

England	83	▲
Australia	81	▲
Scotland	81	▲
United States	74	▲
New Zealand	73	▲
Singapore	72	▲
Italy	71	▲
Slovenia	68	▲
Belgium (Flemish)	66	▲
Hungary	64	▲
Chinese Taipei	62	▲
Hong Kong, SAR	56	○
International average	55	
Netherlands	53	○
Moldova, Republic of	52	○
Armenia	49	▼
Japan	48	▼
Lithuania	46	▼
Cyprus	45	▼
Latvia	42	▼
Russian Federation	39	▼
Norway	35	▼
Iran, Islamic Republic of	31	▼
Tunisia	31	▼
Morocco	30	▼
Philippines	26	▼

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

Item Number: M011006

Correct Response:	D
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Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Two- and Three-Dimensional Shapes	Knowing Facts and Procedures

Statements about triangle

All of the pupils in a class cut out paper shapes. The teacher picked one out and said, "This shape is a triangle." Which of these statements **MUST** be correct?

- (A) The shape has three sides.
- (B) The shape has a right angle.
- (C) The shape has equal sides.
- (D) The shape has equal angles.

Overall Percent Correct

Australia	79	▲
Latvia	82	▲
Netherlands	82	▲
Singapore	82	▲
Chinese Taipei	81	▲
Hong Kong, SAR	81	▲
Russian Federation	81	▲
Italy	79	▲
New Zealand	79	▲
United States	79	▲
England	79	▲
Moldova, Republic of	74	○
Belgium (Flemish)	74	▲
Lithuania	73	○
Scotland	72	○
Cyprus	71	○
International average	71	
Norway	70	○
Armenia	68	○
Japan	68	○
Slovenia	66	○
Iran, Islamic Republic of	61	▼
Hungary	58	▼
Philippines	48	▼
Morocco	47	▼
Tunisia	33	▼

Country average vs.
International average:

Higher	▲
Not different	○
Lower	▼

Item Number: M011022

Correct Response:


A

Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Two- and Three-Dimensional Shapes	Knowing Facts and Procedures

Indicates geometric shapes in the picture

In the picture there are a number of geometric shapes, like circles, squares, rectangles, and triangles. For example, the sun looks like a circle.

Draw lines to three other different objects in the picture and write what shapes they look like.



Overall Percent Correct

Belgium (Flemish)	81	▲
Chinese Taipei	80	▲
New Zealand	74	▲
England	72	▲
Australia	71	▲
Hong Kong, SAR	70	▲
United States	70	▲
Italy	68	▲
Japan	68	▲
Moldova, Republic of	68	▲
Cyprus	67	▲
Latvia	67	▲
Netherlands	67	▲
Singapore	66	▲
Scotland	64	▲
Russian Federation	62	○
Hungary	60	○
Slovenia	60	○
International average	59	
Lithuania	57	○
Norway	45	▼
Armenia	35	▼
Iran, Islamic Republic of	30	▼
Philippines	26	▼
Tunisia	23	▼
Morocco	11	▼

Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

Item Number: M031269

SCORING

Fully Correct Response

- Any three of square, rectangle, triangle, trapezoid, diamond/rhombus, kite correctly identified
- Any two of the above plus circle

Partially Correct Response

- Any two of the above correctly identified
- Any one of the above plus circle

Incorrect Response

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

Indicates geometric shapes in the picture (continued)

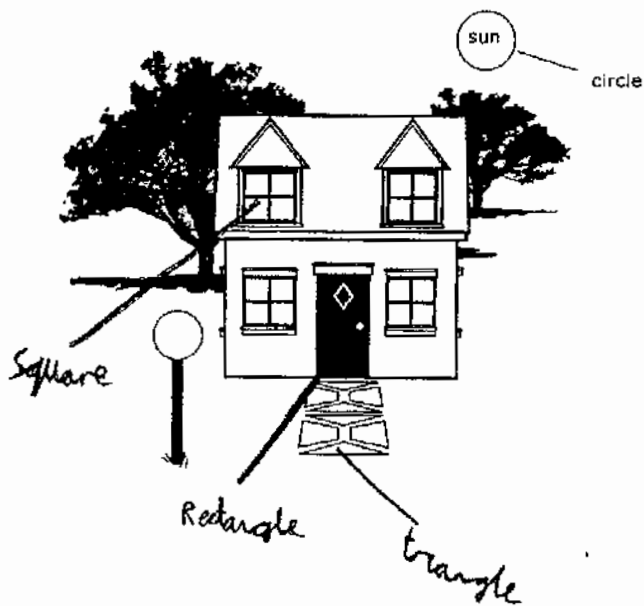
Item Number: M031269

Student Responses

Fully Correct Response:

In the picture there are a number of geometric shapes, such as circles, squares, rectangles, and triangles. For example, the sun looks like a circle.

Draw lines to three other different objects in the picture and write the name of the shape they look like.



Indicates geometric shapes in the picture (continued)

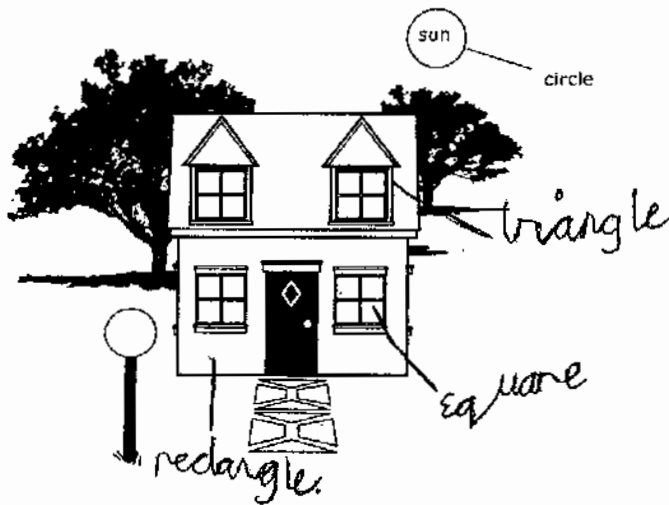
Item Number: M031269

Student Responses (continued)

Partially Correct Response:

In the picture there are a number of geometric shapes, such as circles, squares, rectangles, and triangles. For example, the sun looks like a circle.

Draw lines to three other different objects in the picture and write the name of the shape they look like.



Indicates geometric shapes in the picture (continued)

Item Number: M031269

Student Responses (continued)

Incorrect Response:

In the picture there are a number of geometric shapes, such as circles, squares, rectangles, and triangles. For example, the sun looks like a circle.

Draw lines to three other different objects in the picture and write the name of the shape they look like.




Content Domain	Main Topic	Cognitive Domain
A. GEOMETRY B. GEOMETRY C. NUMBER	Two- and Three-Dimensional Shapes Two- and Three-Dimensional Shapes Fractions and Decimals	Knowing Facts and Procedures Knowing Facts and Procedures Knowing Facts and Procedures

Geometry tiles: black triangle

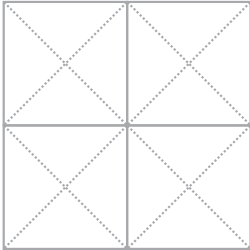
A. Use 2 of the triangle tiles to make one large black triangle. Then show what you did with your tiles by shading in your triangle below.

Shade in Your Triangle Here



B. Use all 4 triangle tiles to make a black square. Then show what you did with your tiles by shading in your square below.

Shade in Your Square Here



C. What fraction of the figure is shaded in part B above?

Answer: _____

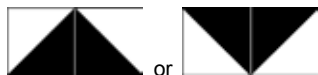
Overall Percent Correct		
Japan	78	▲
Latvia	64	▲
Lithuania	61	▲
Russian Federation	61	▲
Hong Kong, SAR	60	▲
Italy	59	▲
Chinese Taipei	57	▲
Netherlands	55	▲
Cyprus	54	▲
New Zealand	52	▲
England	52	▲
Belgium (Flemish)	52	▲
Australia	51	▲
Norway	50	○
Scotland	48	○
Slovenia	47	○
International average	45	
Singapore	44	○
United States	42	○
Hungary	41	○
Moldova, Republic of	38	▼
Armenia	15	▼
Tunisia	11	▼
Philippines	10	▼
Iran, Islamic Republic of	9	▼
Morocco	6	▼

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

Item Number: M031347A

SCORING

Correct Response



Incorrect Response

- Used two triangle tiles but created two small black triangles
- Other incorrect (including crossed out/erased, stray marks, illegible, or off task)

Geometry tiles: black triangle (continued)

Item Number: M031347A

Student Responses

Correct Response:

- A. Use 2 of the triangle tiles to make one large black triangle. Then show what you did with your tiles by shading in your triangle below.

Shade in Your Triangle Here



Incorrect Response:

- A. Use 2 of the triangle tiles to make one large black triangle. Then show what you did with your tiles by shading in your triangle below.

Shade in Your Triangle Here



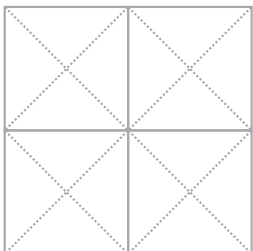
Content Domain	Main Topic	Cognitive Domain
A. GEOMETRY B. GEOMETRY C. NUMBER	Two- and Three-Dimensional Shapes Two- and Three-Dimensional Shapes Fractions and Decimals	Knowing Facts and Procedures Knowing Facts and Procedures Knowing Facts and Procedures

Geometry tiles: black square

- A. Use 2 of the triangle tiles to make one large black triangle. Then show what you did with your tiles by shading in your triangle below.

Shade in Your Triangle Here

- B. Use all 4 triangle tiles to make a black square. Then show what you did with your tiles by shading in your square below.

Shade in Your Square Here

- C. What fraction of the figure is shaded in part B above?

Answer: _____

Item Number: M031347B

SCORING**Correct Response****Incorrect Response**

- Used four triangle tiles but did not create a black square
- Other incorrect (including crossed out/erased, stray marks, illegible, or off task)

Overall Percent Correct

Japan	71	▲
Netherlands	60	▲
Lithuania	57	▲
Russian Federation	57	▲
Belgium (Flemish)	55	▲
Chinese Taipei	54	▲
England	54	▲
Australia	52	▲
New Zealand	52	▲
Italy	51	▲
Scotland	48	▲
Cyprus	47	▲
Norway	47	○
Hong Kong, SAR	46	▲
Hungary	45	○
Singapore	45	○
Slovenia	44	○
United States	42	○

International average	42	
Moldova, Republic of	37	○
Latvia	33	▼
Tunisia	15	▼
Iran, Islamic Republic of	13	▼
Armenia	10	▼
Philippines	7	▼
Morocco	5	▼

Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

Geometry tiles: black square (continued)

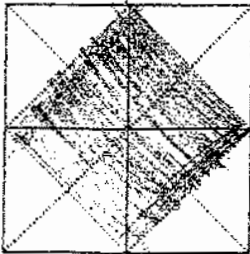
Item Number: M031347B

Student Responses

Correct Response:

- B. Use all 4 triangle tiles to make a black square. Then show what you did with your tiles by shading in your square below.

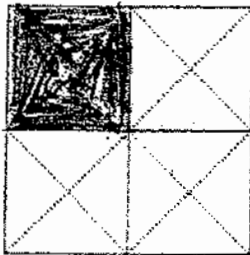
Shade in Your Square Here



Incorrect Response:

- B. Use all 4 triangle tiles to make a black square. Then show what you did with your tiles by shading in your square below.

Shade in Your Square Here




Content Domain	Main Topic	Cognitive Domain
A. GEOMETRY B. GEOMETRY C. NUMBER	Two- and Three-Dimensional Shapes Two- and Three-Dimensional Shapes Fractions and Decimals	Knowing Facts and Procedures Knowing Facts and Procedures Knowing Facts and Procedures

Geometry tiles: fraction shaded

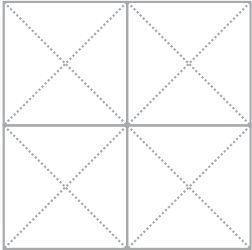
A. Use 2 of the triangle tiles to make one large black triangle. Then show what you did with your tiles by shading in your triangle below.

Shade in Your Triangle Here



B. Use all 4 triangle tiles to make a black square. Then show what you did with your tiles by shading in your square below.

Shade in Your Square Here



C. What fraction of the figure is shaded in part B above?

Answer: _____

Overall Percent Correct		
Singapore	73	▲
Hong Kong, SAR	70	▲
Chinese Taipei	61	▲
Japan	56	▲
England	49	▲
United States	48	▲
Cyprus	45	▲
Belgium (Flemish)	45	▲
Hungary	38	▲
Netherlands	38	▲
New Zealand	36	○
Australia	34	○
International average	33	
Latvia	28	▼
Scotland	28	▼
Italy	26	▼
Lithuania	24	▼
Norway	23	▼
Russian Federation	21	▼
Slovenia	18	▼
Iran, Islamic Republic of	17	▼
Moldova, Republic of	17	▼
Philippines	14	▼
Armenia	5	▼
Tunisia	3	▼
Morocco	1	▼

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

Item Number: M031347C

SCORING

Correct Response

- 1/2 or equivalent
- Correct fraction based on incorrect figure in part

Incorrect Response

- 1/4
- Other incorrect (including crossed out/erased, stray marks, illegible, or off task)

Geometry tiles: fraction shaded (continued)

Item Number: M031347C

Student Responses

Correct Response:

C. What fraction of the figure is shaded in part B above?

Answer: $\frac{1}{4}$

Incorrect Response:


C. What fraction of the figure is shaded in part B above?

Answer: The middle of it because I could see 7
square

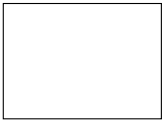
Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Two- and Three-Dimensional Shapes	Solving Routine Problems

Draw line on rectangle/2 triangles


A. Draw 1 straight line on this rectangle to divide it into 2 triangles.



B. Draw 1 straight line on this rectangle to divide it into 2 rectangles.



C. Draw 2 straight lines on this rectangle to divide it into 1 rectangle and 2 triangles.



Item Number: M031272A

SCORING

Correct Response

- One diagonal drawn

Incorrect Response

- One horizontal or vertical line drawn
- Other incorrect (including crossed out/erased, stray marks, illegible or off task)

Overall Percent Correct

Hong Kong, SAR	95	▲
Chinese Taipei	93	▲
Japan	92	▲
Latvia	92	▲
Russian Federation	91	▲
Lithuania	90	▲
Moldova, Republic of	83	▲
Singapore	83	▲
Belgium (Flemish)	83	▲
Netherlands	82	▲
Cyprus	80	▲
New Zealand	80	▲
England	80	▲
Hungary	79	▲
Australia	79	○
Slovenia	79	○
Scotland	79	▲
International average	75	
Italy	74	○
United States	74	○
Norway	68	▼
Armenia	57	▼
Iran, Islamic Republic of	55	▼
Tunisia	50	▼
Morocco	40	▼
Philippines	21	▼

Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

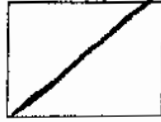
Draw line on rectangle/2 triangles (continued)

Item Number: M031272A

Student Responses

Correct Response:

A. Draw 1 straight line on this rectangle to make 2 triangles.



Incorrect Response:


A. Draw 1 straight line on this rectangle to make 2 triangles.



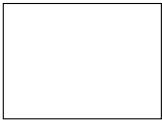
Content Domain	Main Topic	Cognitive Domain
GEOMETRY	Two- and Three-Dimensional Shapes	Solving Routine Problems

Draw line on rectangle/2 rectangles


A. Draw 1 straight line on this rectangle to divide it into 2 triangles.



B. Draw 1 straight line on this rectangle to divide it into 2 rectangles.



C. Draw 2 straight lines on this rectangle to divide it into 1 rectangle and 2 triangles.



Overall Percent Correct

Hong Kong, SAR	99	▲
Chinese Taipei	95	▲
Singapore	94	▲
Latvia	93	▲
Lithuania	92	▲
Russian Federation	92	▲
Australia	91	▲
Japan	91	▲
Belgium (Flemish)	91	▲
Hungary	89	▲
New Zealand	89	▲
Slovenia	89	▲
England	89	▲
Scotland	89	▲
United States	88	▲
Cyprus	86	▲
Italy	86	▲
Netherlands	85	○
Moldova, Republic of	84	○
International average	83	
Iran, Islamic Republic of	76	▼
Norway	74	▼
Armenia	58	▼
Tunisia	58	▼
Morocco	52	▼
Philippines	34	▼

Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

Item Number: M031272B

SCORING

Correct Response

- One horizontal or vertical line drawn

Incorrect Response

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

Draw line on rectangle/2 rectangles (continued)

Item Number: M031272B

Student Responses

Correct Response:

B. Draw 1 straight line on this rectangle to make 2 rectangles.



Incorrect Response:


B. Draw 1 straight line on this rectangle to make 2 rectangles.




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

Draw line on rectangle/1 rectangle, 2 triangles


A. Draw 1 straight line on this rectangle to divide it into 2 triangles.



B. Draw 1 straight line on this rectangle to divide it into 2 rectangles.



C. Draw 2 straight lines on this rectangle to divide it into 1 rectangle and 2 triangles.



Overall Percent Correct

Hong Kong, SAR	85	▲
Chinese Taipei	84	▲
Japan	75	▲
Singapore	71	▲
Russian Federation	68	▲
Latvia	66	▲
Cyprus	59	▲
Lithuania	59	▲
Hungary	52	▲
Belgium (Flemish)	52	▲
Netherlands	50	○
Australia	47	○
International average	47	
Moldova, Republic of	45	○
England	45	○
New Zealand	44	○
Slovenia	44	○
Scotland	41	▼
Armenia	35	▼
United States	34	▼
Italy	33	▼
Norway	27	▼
Tunisia	20	▼
Morocco	16	▼
Iran, Islamic Republic of	15	▼
Philippines	11	▼

Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

Item Number: M031272C

SCORING

Correct Response

- Two lines correctly drawn to show a smaller rectangle and two triangles

Incorrect Response

- Attempt made with two lines drawn but drawing does not show a line dividing the rectangle into 2 rectangles with a diagonal accurately drawn in one of them
- Other incorrect (including crossed out/erased, stray marks, illegible or off task)

Draw line on rectangle/1rectangle, 2 triangles (continued)

Item Number: M031272C

Student Responses

Correct Response:

C. Draw 2 straight lines on this rectangle to make 1 rectangle and 2 triangles.



Incorrect Response:

C. Draw 2 straight lines on this rectangle to make 1 rectangle and 2 triangles.

