

Content Domain	Main Topic	Cognitive Domain
EARTH SCIENCE	Earth in the Solar System and Universe	Conceptual Understanding

Which diagram shows shadow

At different times during a sunny day a tree was seen to cast a shadow of different length as shown in the diagrams below. Which diagram shows the shadow at mid-day (12 noon)?

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

Item Number: S011027

Overall Percent Correct		
Chinese Taipei	88	▲
Hong Kong, SAR	86	▲
Japan	86	▲
Hungary	83	▲
England	83	▲
Lithuania	78	▲
Singapore	78	▲
Italy	77	▲
Australia	75	▲
Latvia	75	▲
Moldova, Republic of	75	▲
New Zealand	75	▲
Belgium (Flemish)	75	▲
Norway	72	○
Netherlands	70	○
Slovenia	70	○
United States	70	○
International average	70	
Russian Federation	69	○
Scotland	69	○
Armenia	60	▼
Philippines	57	▼
Cyprus	52	▼
Iran, Islamic Republic of	47	▼
Tunisia	42	▼
Morocco	35	▼

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

Correct Response:	C
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Content Domain	Main Topic	Cognitive Domain
EARTH SCIENCE	Earth in the Solar System and Universe	Factual Knowledge

Which is hottest

Which of these is hottest?

Ⓐ The Earth

Ⓑ Mars

Ⓒ The Moon

Ⓓ The Sun

Overall Percent Correct

Norway	99	▲
Latvia	98	▲
Lithuania	98	▲
Moldova, Republic of	98	▲
Russian Federation	98	▲
Scotland	98	▲
Belgium (Flemish)	98	▲
New Zealand	97	▲
Slovenia	97	▲
United States	97	▲
England	97	▲
Australia	96	▲
Hungary	96	▲
Netherlands	96	▲
Singapore	96	▲
Armenia	92	○
Italy	92	○
International average	91	
Japan	90	○
Hong Kong, SAR	85	▼
Iran, Islamic Republic of	85	▼
Cyprus	83	▼
Tunisia	82	▼
Chinese Taipei	81	▼
Morocco	68	▼
Philippines	68	▼

**Country average vs.
International average:**

Higher	▲
Not different	○
Lower	▼

Item Number: S011018

Correct Response:	D
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Content Domain	Main Topic	Cognitive Domain
EARTH SCIENCE	Earth in the Solar System and Universe	Factual Knowledge

Earth's movement

Each year the Earth moves once around

Ⓐ Mars

Ⓑ the Sun

Ⓒ the Moon

Ⓓ all of the other planets

Overall Percent Correct

Russian Federation	87	▲
Latvia	86	▲
Hungary	84	▲
Iran, Islamic Republic of	84	▲
Armenia	82	▲
Lithuania	80	▲
Norway	80	▲
England	79	▲
Moldova, Republic of	78	▲
United States	74	▲
Hong Kong, SAR	70	○
Australia	69	○
Belgium (Flemish)	69	○
Italy	68	○
International average	67	
New Zealand	66	○
Scotland	66	○
Chinese Taipei	63	▼
Netherlands	62	▼
Singapore	62	▼
Slovenia	60	▼
Japan	58	▼
Cyprus	55	▼
Philippines	46	▼
Morocco	30	▼
Tunisia	29	▼

Country average vs.
International average:

Higher	▲
Not different	○
Lower	▼

Item Number: S011022

Correct Response:	B
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Content Domain	Main Topic	Cognitive Domain
EARTH SCIENCE	Earth in the Solar System and Universe	Factual Knowledge

How much time to next full moon

Kate sees a full moon. About how much time will go by before the next full moon?

Ⓐ one week

Ⓑ two weeks

Ⓒ one month

Ⓓ one year

Overall Percent Correct

Chinese Taipei	62	▲
Latvia	47	▲
Moldova, Republic of	46	▲
New Zealand	45	▲
Slovenia	45	▲
United States	43	▲
Norway	40	○
Australia	39	○
Japan	38	○
Russian Federation	38	○
England	38	○
Hong Kong, SAR	37	○
Netherlands	37	○
International average	37	
Singapore	36	○
Scotland	36	○
Iran, Islamic Republic of	34	○
Italy	34	○
Belgium (Flemish)	34	○
Philippines	33	○
Lithuania	32	▼
Armenia	30	▼
Tunisia	27	▼
Cyprus	26	▼
Hungary	26	▼
Morocco	24	▼

Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

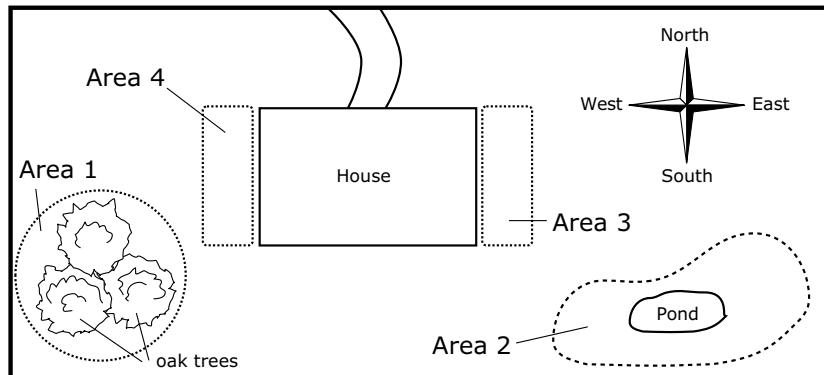
Item Number: S031060

Correct Response:	C
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Content Domain	Main Topic	Cognitive Domain
EARTH SCIENCE	Earth in the Solar System and Universe	Reasoning and Analysis

Garden: which side of the house gets most sun

A plan of Rebecca's house and garden is shown below. There are four areas in the garden where she would like to grow some plants (Areas 1, 2, 3, and 4).



Which side of Rebecca's house will receive the most sun in the morning?

(Check one box.)

- East side (Area 3)
- West side (Area 4)

Explain your answer.

Item Number: S031440

SCORING

Correct Response

- **EAST** with explanation stating that the Sun rises in the East (or similar).
Examples: East. The Sun comes up on the East side.
East. The Sun travels from East to West.
East. When the sun comes up on that side it makes a shadow on the west side.
East. Area 4 is shaded in the morning because the Sun is on the East side.
- Other correct

Incorrect Response

- **EAST** with no explanation or incorrect explanation. [May include a true statement that does not answer the question.]
Examples: East. Because it is closest to the pond.
East. Because it's on the East side.
East. Because the Sun travels across the sky.
- **WEST** with an explanation stating that the Sun rises in the West (or similar).
Examples: West. When the sun rises in the morning it's on the west.
- **WEST** with no explanation or other incorrect explanation.
Examples: West. The oak trees are there.
- Other incorrect (including crossed out/erased, stray marks, illegible or off task)

Overall Percent Correct

Chinese Taipei	55	▲
Hong Kong, SAR	51	▲
Japan	45	▲
Singapore	42	▲
Hungary	41	▲
Latvia	34	▲
Netherlands	33	▲
Italy	30	○
Slovenia	30	○
United States	29	○
Australia	28	○
Cyprus	28	○
New Zealand	27	○
International average	26	
Lithuania	23	○
Belgium (Flemish)	22	○
Russian Federation	21	▼
England	21	○
Moldova, Republic of	16	▼
Norway	14	▼
Iran, Islamic Republic of	13	▼
Scotland	11	▼
Morocco	10	▼
Philippines	7	▼
Tunisia	7	▼
Armenia	4	▼

Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

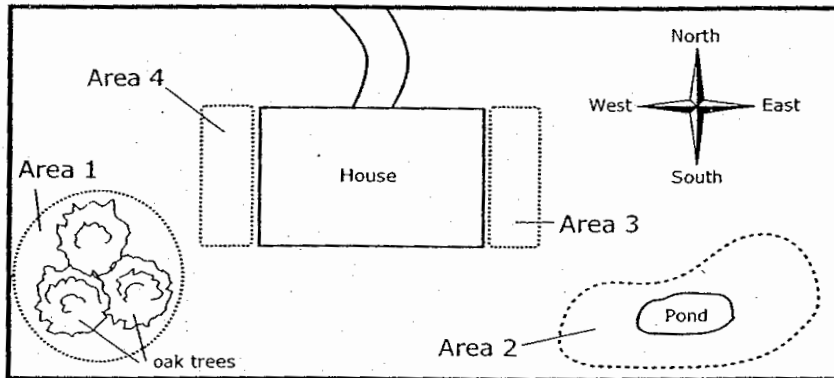
Garden: which side of the house gets most sun (continued)

Item Number: S031440

Student Responses

Correct Response:

A plan of Rebecca's house and garden is shown below. There are four areas in the garden where she would like to grow some plants (Areas 1, 2, 3, and 4).



Which side of Rebecca's house will receive the most sun in the morning?

(Check one box.)

- East side (Area 3)
 West side (Area 4)

Explain your answer.

Area 3 will get the most light because the sun rises in the east and sets in the west.

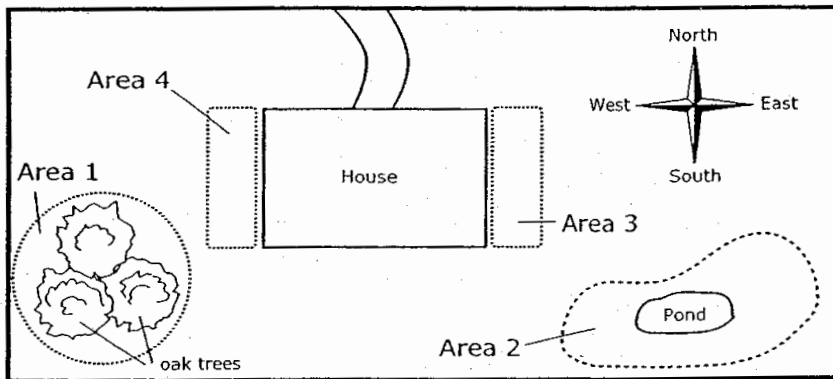
Garden: which side of the house gets most sun (continued)

Item Number: S031440

Student Responses (continued)

Incorrect Response:

A plan of Rebecca's house and garden is shown below. There are four areas in the garden where she would like to grow some plants (Areas 1, 2, 3, and 4).



Which side of Rebecca's house will receive the most sun in the morning?

(Check one box.)

- East side (Area 3)
- West side (Area 4)

Explain your answer.

I choose west side (Area 4) because
the sun rises on the west side. That's the
side that will get the most sun in the morning.

Content Domain	Main Topic	Cognitive Domain
EARTH SCIENCE	Earth Processes, Cycles, and History	Conceptual Understanding

Direction of water

Draw an arrow on the Old River to show the direction that the water flows.

Overall Percent Correct		
Chinese Taipei	64	▲
Russian Federation	64	▲
Moldova, Republic of	62	▲
Japan	58	▲
Latvia	56	▲
Netherlands	54	▲
England	52	▲
Italy	51	▲
Singapore	51	▲
Slovenia	50	▲
New Zealand	49	▲
Australia	48	○
Scotland	48	○
Cyprus	47	○
Hong Kong, SAR	47	○
Norway	45	○
Hungary	44	○
International average	44	
Armenia	42	○
Belgium (Flemish)	40	▼
United States	37	▼
Lithuania	30	▼
Iran, Islamic Republic of	18	▼
Morocco	14	▼
Tunisia	13	▼
Philippines	12	▼

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

Item Number: S011032

SCORING

Correct Response

- Draws an arrow on the diagram that is on river or along the river below the feeder rivers and streams with an arrowhead pointing towards the Great Ocean.
- Other correct

Incorrect Response

- Draws an arrow pointing the opposite way or a prose description of this direction.
- Draws an arrow that points in any other direction.
- Other incorrect (including crossed out/erased, stray marks, illegible, or off task)

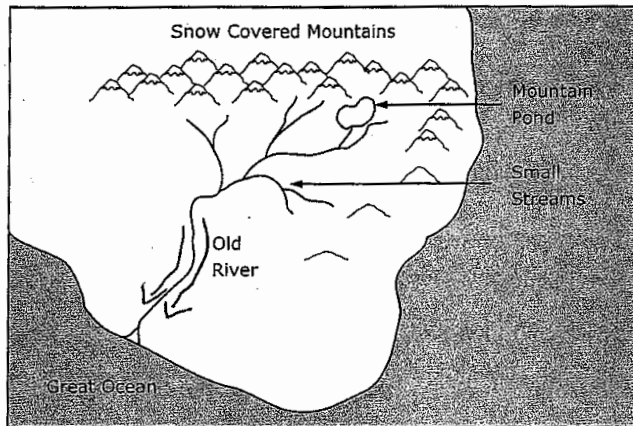
Direction of water (continued)

Item Number: S011032

Student Responses

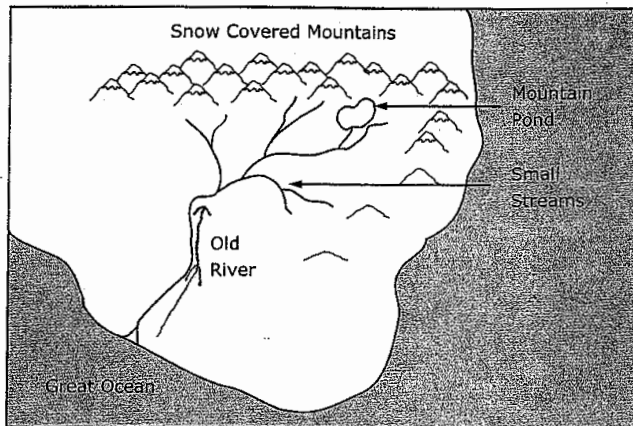
Correct Response:

Draw an arrow on the Old River to show the direction that the water flows.



Incorrect Response:

Draw an arrow on the Old River to show the direction that the water flows.



Content Domain	Main Topic	Cognitive Domain
EARTH SCIENCE	Earth Processes, Cycles, and History	Conceptual Understanding

Water vapor when it gets cold

On a hot, humid day the air contains a lot of water vapor. What happens to the water vapor in the air when the air becomes very cold?

Overall Percent Correct

Netherlands	72	▲
Singapore	68	▲
Belgium (Flemish)	67	▲
Hungary	65	▲
Latvia	60	▲
United States	58	▲
Chinese Taipei	57	▲
Russian Federation	55	▲
England	54	▲
Australia	53	▲
Italy	49	○
Norway	49	○
Moldova, Republic of	48	○
New Zealand	48	○
Lithuania	47	○
Scotland	47	○
International average	47	
Cyprus	45	○
Japan	45	○
Slovenia	43	○
Armenia	37	▼
Hong Kong, SAR	34	▼
Iran, Islamic Republic of	28	▼
Philippines	20	▼
Tunisia	18	▼
Morocco	12	▼

Item Number: S031382

SCORING

Correct Response

- Refers to **condensation** or **freezing** (or equivalent).
Examples: *It freezes.*
It condenses.
Condensation.
It condenses and turns into rain.
- Mentions cloud formation or a form of precipitation (e.g., rain, snow, fog, etc.)
Examples: *The water vapor changes to rain.*
It changes to snow.
Water vapor turns into clouds.
It rises into the clouds and becomes rain droplets.
It turns foggy.
It rains.
- Other correct
Examples: *It falls to the ground.*

Incorrect Response

- Mentions only that the water becomes cold. [No mention of a change of state or precipitation.]
Examples: *The water vapor becomes cold.*
Its temperature drops.
- Mentions only that water vapor rises (or similar). [No mention of condensation or precipitation.]
Examples: *The water vapor will rise on a hot day.*
- Other incorrect (including crossed out/erased, stray marks, illegible, or off task)
Examples: *It disappears.*

Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

Water vapor when it gets cold (continued)

Item Number: S031382

Student Responses

Correct Response:

On a hot, humid day the air contains a lot of water vapor. What happens to the water vapor in the air when the air becomes very cold?

The water vapor freezes and becomes snow or ice.

Incorrect Response:

On a hot, humid day the air contains a lot of water vapor. What happens to the water vapor in the air when the air becomes very cold?

It get really windy.

Content Domain	Main Topic	Cognitive Domain
EARTH SCIENCE	Earth Processes, Cycles, and History	Factual Knowledge

Where are fossils found

The fossils of dinosaurs that lived millions of years ago can be found in

Ⓐ the water of oceans.

Ⓑ the ice on ponds.

Ⓒ the trunks of trees.

Ⓓ rocks in the ground.

Overall Percent Correct

Chinese Taipei	93	▲
Japan	90	▲
Australia	89	▲
Hong Kong, SAR	89	▲
United States	89	▲
Latvia	88	▲
Lithuania	88	▲
Slovenia	88	▲
Netherlands	87	▲
New Zealand	87	▲
England	87	▲
Singapore	86	▲
Belgium (Flemish)	86	▲
Hungary	85	▲
Russian Federation	85	▲
Scotland	85	▲
Italy	79	○
International average	76	
Cyprus	75	○
Norway	75	○
Moldova, Republic of	64	▼
Armenia	59	▼
Iran, Islamic Republic of	43	▼
Philippines	34	▼
Tunisia	34	▼
Morocco	28	▼

Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

Item Number: S011005

Correct Response:	D
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Content Domain	Main Topic	Cognitive Domain
EARTH SCIENCE	Earth Processes, Cycles, and History	Reasoning and Analysis

Town where it is most likely to snow

	Clouds in the Sky	Lowest Temperature	Highest Temperature
Town A	no	10°C	25°C
Town B	yes	20°C	30°C
Town C	no	-10°C	-1°C
Town D	yes	-15°C	5°C

The table above shows some weather information for four different towns during a 24-hour period. In which town did it most likely snow?

- (A) Town A
 (B) Town B
 (C) Town C
 (D) Town D

Overall Percent Correct

Belgium (Flemish)	57	▲
Japan	56	▲
Hungary	54	▲
Netherlands	54	▲
England	49	▲
Slovenia	43	▲
Cyprus	40	▲
Latvia	40	○
United States	40	▲
Italy	39	○
Lithuania	38	○
Norway	37	○
Russian Federation	37	○
Australia	36	○
New Zealand	36	○
International average	36	
Singapore	35	○
Chinese Taipei	34	○
Scotland	34	○
Moldova, Republic of	32	○
Hong Kong, SAR	31	▼
Armenia	19	▼
Iran, Islamic Republic of	16	▼
Tunisia	13	▼
Philippines	12	▼
Morocco	9	▼

Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

Item Number: S031383

Correct Response:

D

Content Domain	Main Topic	Cognitive Domain
EARTH SCIENCE	Earth's Structure and Physical Features	Conceptual Understanding

Saltiest water

Look at this diagram.

The saltiest water is in the

- (A) Great Ocean
- (B) Mountain Pond
- (C) Old River
- (D) Small Streams

Item Number: S011007

Overall Percent Correct		
Italy	95	▲
Chinese Taipei	94	▲
Japan	91	▲
Cyprus	87	▲
Slovenia	85	▲
Hungary	82	▲
Latvia	82	▲
United States	82	▲
Russian Federation	81	▲
England	81	▲
Norway	80	▲
Belgium (Flemish)	80	▲
Scotland	79	▲
Moldova, Republic of	76	○
Netherlands	76	○
Australia	74	○
New Zealand	73	○
International average	73	
Hong Kong, SAR	71	○
Armenia	65	▼
Lithuania	65	▼
Singapore	63	▼
Iran, Islamic Republic of	47	▼
Philippines	43	▼
Morocco	37	▼
Tunisia	23	▼

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

Correct Response: A

Content Domain	Main Topic	Cognitive Domain
EARTH SCIENCE	Earth's Structure and Physical Features	Conceptual Understanding

Layers of Earth

The picture shows the three main layers of the Earth.

Where is it the hottest?

(A) Layer A
 (B) Layer B
 (C) Layer C
 (D) All three layers are the same temperature.

Item Number: S012007

Overall Percent Correct

United States	90	▲
Italy	89	▲
Netherlands	88	▲
New Zealand	87	▲
Hong Kong, SAR	86	▲
England	86	▲
Moldova, Republic of	84	▲
Scotland	84	▲
Norway	83	▲
Hungary	81	▲
Slovenia	81	▲
Belgium (Flemish)	81	▲
Australia	80	▲
Latvia	80	▲
Japan	79	▲
Chinese Taipei	78	○
Singapore	76	○
International average	76	
Lithuania	75	○
Cyprus	73	○
Russian Federation	70	▼
Armenia	65	▼
Morocco	52	▼
Iran, Islamic Republic of	51	▼
Philippines	48	▼
Tunisia	47	▼

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

Correct Response:	C
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