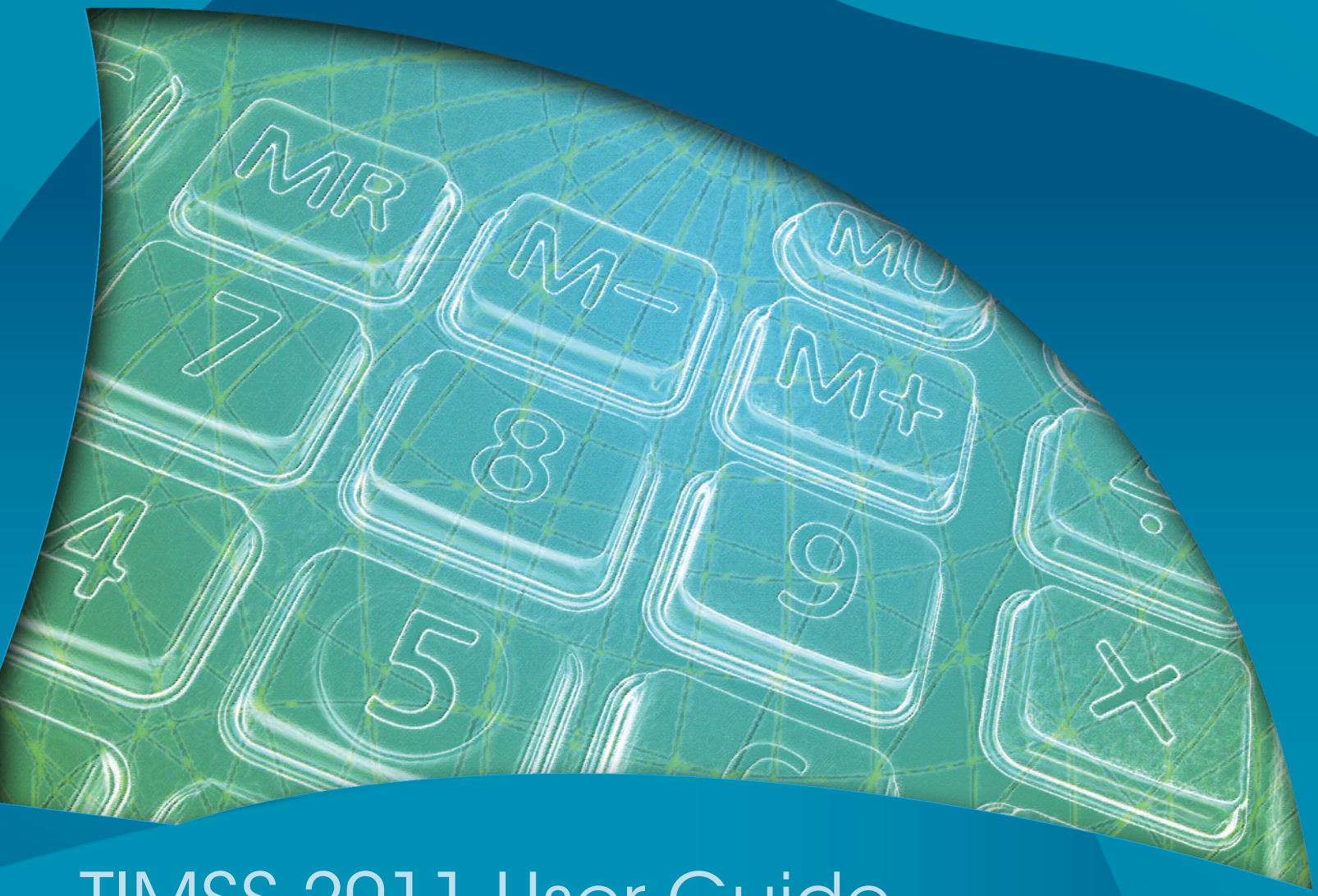
TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE STUDY

TIMSS

TIMSS & PIRLS
International Study Center
Lynch School of Education, Boston College



TIMSS 2011 User Guide for the International Database

Released Items

Science – Fourth Grade

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Item ID	Subject	Grade	Block	Block Seq	Content Domain	Cognitive Domain	Maximum Points	Key
S031356	S	4	S01	01	Life Science	Knowing	1	B
S031291	S	4	S01	02	Life Science	Applying	1	A
S031230	S	4	S01	03	Life Science	Applying	1	D
S031325	S	4	S01	04	Life Science	Applying	1	See scoring guide
S031068	S	4	S01	05	Physical Science	Reasoning	1	A
S031418	S	4	S01	06	Physical Science	Applying	1	B
S031197A	S	4	S01	07	Physical Science	Knowing	1	See scoring guide
S031197B	S	4	S01	07	Physical Science	Knowing	1	See scoring guide
S031197Z	S	4	S01	07	Physical Science	Knowing	2	Derived*
S031371	S	4	S01	08	Physical Science	Applying	1	D
S031376	S	4	S01	09	Earth Science	Knowing	1	D
S031044	S	4	S01	10	Earth Science	Reasoning	1	See scoring guide
S031390A	S	4	S01	11	Life Science	Applying	1	See scoring guide
S031390B	S	4	S01	11	Life Science	Applying	1	See scoring guide
S031390Z	S	4	S01	11	Life Science	Applying	2	Derived*
S051057	S	4	S02	01	Life Science	Knowing	1	See scoring guide
S051032	S	4	S02	02	Life Science	Applying	1	D
S051049B	S	4	S02	03	Life Science	Applying	1	B
S051049C	S	4	S02	03	Life Science	Applying	1	B
S051049D	S	4	S02	03	Life Science	Applying	1	A
S051049E	S	4	S02	03	Life Science	Applying	1	A
S051049Z	S	4	S02	03	Life Science	Applying	1	Derived*
S051033	S	4	S02	04	Life Science	Applying	1	B
S051173	S	4	S02	05	Life Science	Knowing	1	See scoring guide
S051086	S	4	S02	06	Physical Science	Knowing	1	A
S051179	S	4	S02	07	Physical Science	Applying	1	C
S051074	S	4	S02	08	Physical Science	Applying	1	See scoring guide
S051119	S	4	S02	09	Physical Science	Reasoning	1	See scoring guide
S051071	S	4	S02	10	Physical Science	Reasoning	1	B
S051100	S	4	S02	11	Earth Science	Knowing	1	C
S051156	S	4	S02	12	Earth Science	Knowing	1	D
S041117	S	4	S03	01	Physical Science	Knowing	1	B
S041120	S	4	S03	02	Physical Science	Knowing	1	C
S041003	S	4	S03	03	Life Science	Knowing	1	See scoring guide
S041224	S	4	S03	04	Life Science	Knowing	2	See scoring guide
S041163	S	4	S03	05	Life Science	Applying	1	B
S041039	S	4	S03	06	Life Science	Reasoning	1	See scoring guide
S041014	S	4	S03	07	Life Science	Applying	1	A
S041181	S	4	S03	08	Life Science	Applying	1	See scoring guide
S041174	S	4	S03	09	Life Science	Applying	1	See scoring guide
S041049	S	4	S03	10	Physical Science	Reasoning	1	C
S041208	S	4	S03	11	Earth Science	Knowing	1	B
S041060	S	4	S03	12	Physical Science	Applying	1	See scoring guide
S041201A	S	4	S03	13	Earth Science	Applying	1	See scoring guide
S041201B	S	4	S03	13	Earth Science	Applying	1	See scoring guide
S031340	S	4	S05	01	Life Science	Knowing	1	C
S031236	S	4	S05	02	Life Science	Knowing	1	D
S031391A	S	4	S05	03	Earth Science	Knowing	1	See scoring guide
S031391B	S	4	S05	03	Earth Science	Knowing	1	See scoring guide
S031391Z	S	4	S05	03	Earth Science	Knowing	2	Derived*

Item ID	Subject	Grade	Block	Block Seq	Content Domain	Cognitive Domain	Maximum Points	Key
S031361	S	4	S05	04	Life Science	Reasoning	1	B
S031001	S	4	S05	05	Life Science	Applying	1	D
S031410	S	4	S05	07	Physical Science	Knowing	1	A
S031421	S	4	S05	08	Physical Science	Knowing	1	See scoring guide
S031298	S	4	S05	09	Physical Science	Applying	1	B
S031076	S	4	S05	10	Physical Science	Reasoning	1	See scoring guide
S031275	S	4	S05	11	Earth Science	Applying	1	C
S041311	S	4	S06	01	Physical Science	Applying	1	B
S041178	S	4	S06	02	Life Science	Knowing	1	A
S041182	S	4	S06	03	Life Science	Applying	1	See scoring guide
S041180	S	4	S06	04	Life Science	Applying	1	C
S041187	S	4	S06	05	Physical Science	Knowing	1	D
S041013A	S	4	S06	06	Life Science	Applying	1	See scoring guide
S041013B	S	4	S06	06	Life Science	Applying	1	See scoring guide
S041067	S	4	S06	07	Physical Science	Knowing	1	See scoring guide
S041305	S	4	S06	08	Physical Science	Reasoning	1	A
S041048	S	4	S06	09	Physical Science	Reasoning	1	See scoring guide
S041110	S	4	S06	10	Earth Science	Knowing	1	See scoring guide
S041069	S	4	S06	11	Physical Science	Applying	1	B
S041100	S	4	S06	12	Earth Science	Knowing	1	B
S041092	S	4	S06	13	Earth Science	Knowing	1	D
S031254	S	4	S07	01	Life Science	Knowing	1	B
S031266	S	4	S07	02	Life Science	Reasoning	1	D
S031233	S	4	S07	03	Life Science	Applying	1	See scoring guide
S031204	S	4	S07	04	Physical Science	Applying	1	See scoring guide
S031273	S	4	S07	05	Physical Science	Applying	1	B
S031299	S	4	S07	06	Physical Science	Knowing	1	See scoring guide
S031281	S	4	S07	07	Life Science	Knowing	1	B
S031077	S	4	S07	08	Physical Science	Applying	1	A
S031311	S	4	S07	09	Physical Science	Knowing	1	B
S031088A	S	4	S07	10	Earth Science	Knowing	1	See scoring guide
S031088B	S	4	S07	10	Earth Science	Knowing	1	See scoring guide
S031088Z	S	4	S07	10	Earth Science	Knowing	2	Derived*
S031389	S	4	S07	11	Earth Science	Knowing	1	D

* For details about how score points were awarded for each derived item, please see "Reviewing the TIMSS and PIRLS 2011 Achievement Item Statistics" in Methods and Procedures in TIMSS and PIRLS 2011: http://timssandpirls.bc.edu/methods/t-achievement-scales.html

S031356

A predator is an animal that feeds on other animals.
Which of these is a predator?

Ⓐ deer
Ⓑ wolf
Ⓒ cow
Ⓓ goat

Content Domain

Life Science

Topic Area

Ecosystems

Cognitive Domain

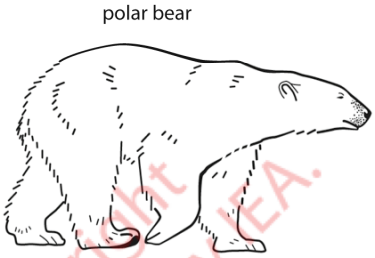
Knowing

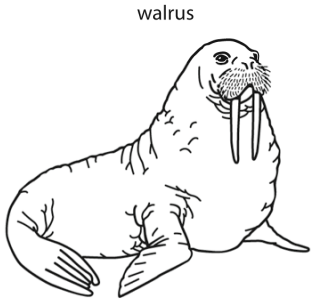
Maximum Points

1

Key

B





Polar bears and walruses look very different, but both can survive in the extreme cold. A polar bear has a thick coat of fur that helps keep it warm. The walrus has no fur.

What does the walrus have that helps it keep warm?

Ⓐ fat layers
Ⓑ tusks
Ⓒ whiskers
Ⓓ flippers

S031291

Content Domain

Life Science

Topic Area

Interactions with the Environment

Cognitive Domain

Applying

Maximum Points

1

Key

A

S031230

What do birds, bats and butterflies have in common?

Ⓐ feathers
Ⓑ hair
Ⓒ internal skeleton
Ⓓ wings

Content Domain

Life Science

Topic Area

Characteristics and Life Processes of Living Things

Cognitive Domain

Applying

Maximum Points

1

Key

D

S031325

The normal temperature of the human body is about 37 degrees Celsius.
Manuel takes his temperature one morning after waking up.
His body temperature is 40 degrees Celsius.

Write down one thing that could have caused his temperature to be higher than normal.

Content Domain

Life Science

Topic Area

Human Health

Cognitive Domain

Applying

Maximum Points

1

Key

See scoring guide

Code	Response	Item: S031325
	Correct Response	
10	Refers to Manuel being sick, having a fever, or similar. *Examples:* *He was ill.* *He had an infection.* *He was running a fever.* *He may have had heat stroke.* *He may have pneumonia.* *A virus could have caused him to have a temperature.*	
	Incorrect Response	
70	Refers only to getting cold, wet, or similar. [Reflects misconception about cause of illness.] *Examples:* *He was out in the cold the night before.* *He swam in ice cold water.*	
71	Refers only to a factor affecting external temperature. *Examples:* *The weather was too hot.* *Too many blankets.* *He was wearing hot pajamas.* *He was in the sun.* *He took a hot bath.*	
79	Other incorrect (including crossed out, erased, stray marks, illegible, or off task) *Examples:* *He had a headache.* *He stayed out too late the night before.*	
	Nonresponse	
99	Blank	

Maria designed an experiment using salt and water. The results of her experiment are shown in the table.

Amount of Salt Dissolved	Water Volume	Water Temperature	Was Mixture Stirred?
15 grams	50 ml	25° C	Yes
30 grams	100 ml	25° C	Yes
45 grams	150 ml	25° C	Yes
60 grams	200 ml	25° C	Yes

What was Maria studying in her experiment?

Ⓐ How much salt will dissolve in different volumes of water.
Ⓑ How much salt will dissolve at different temperatures.
Ⓒ If stirring increases how fast salt will dissolve.
Ⓓ If stirring decreases how fast will salt dissolve.

S031068

Content Domain

Physical Science

Topic Area

Classification and Properties of Matter

Cognitive Domain

Reasoning

Maximum Points

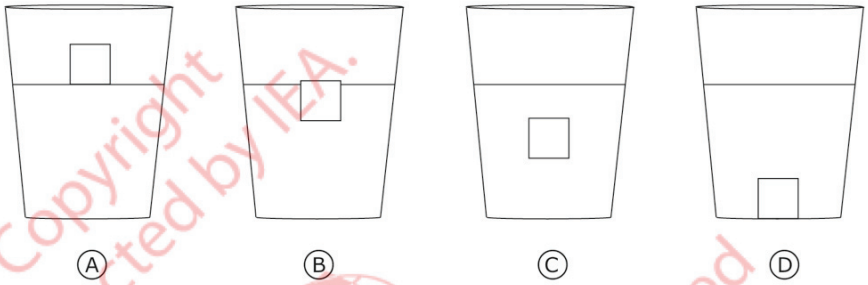
1

Key

A

S031418

A piece of ice is placed in a glass of water. Which picture best shows the position of the ice in the water?



Content Domain

Physical Science

Topic Area

Classification and Properties of Matter

Cognitive Domain

Applying

Maximum Points

1

Key

B

S031197

Name two things electricity can be used for in daily life.

Use 1:

Use 2:

Content Domain

Physical Science

Topic Area

Sources and Effects of Energy

Cognitive Domain

Knowing

Maximum Points

2

Key

See scoring guide

Note: Each of the two responses is coded separately. The same code may be used twice if they are based on general categories. However, if the two responses are essentially the same, the second response should be coded as 79. For example, if a response mentions both a "lamp" and a "lightbulb", the first response is given a Code 10 and the second response is given a Code 79. If a response mentions "television" and "radio", both responses should be given Code 12. If only one response is given, the second should be coded as 99.

Two correct responses will be given 2 score points and one correct response will be given 1 score point.

Code	Response	Item: S031197A,B
	Correct Response	
10	Refers to providing light. *Examples:* *Powering a lamp.* *Light.* *Light bulbs.*	
11	Refers to supplying heat. *Examples:* *For heating homes.* *Heat.*	
12	Refers to an electrical household appliance or device. *Examples:* *Television, radio, refrigerator, computers, telephone, fan, washing machine, hair dryer, electric kettle, oven, toaster, etc.*	
13	Refers to transportation. *Examples:* *Electric cars, buses, trains, etc.*	
19	Other correct	
	Incorrect Response	
70	Response too vague. [Connection to light, heat or other use not clear.] *Examples:* *It helps us.* *To read and write.* *For energy.*	
79	Other incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

S031371

During freezing, melting, and boiling, water changes from one state to another state.

Heat needs to be supplied for which of these to take place?

Ⓐ boiling only
Ⓑ melting only
Ⓒ melting and freezing but not boiling
Ⓓ melting and boiling but not freezing

Content Domain

Physical Science

Topic Area

Classification and Properties of Matter

Cognitive Domain

Applying

Maximum Points

1

Key

D

S031376

Plants grow best in soils that are rich in which of the following?

Ⓐ grains of sand
Ⓑ lumps of clay
Ⓒ layers of gravel
Ⓓ decaying plants and animals

Content Domain

Earth Science

Topic Area

Earth's Structure, Physical Characteristics, and Resources

Cognitive Domain

Knowing

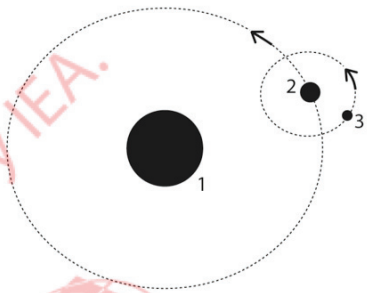
Maximum Points

1

Key

D

The figure below shows Earth, the Moon, and the Sun. Each body is labeled by a number. The arrows show the direction each body is moving.



Fill in the correct number next to each body (1, 2 or 3).

Earth is body number: _____

The Moon is body number: _____

The Sun is body number: _____

S031044

Content Domain

Earth Science

Topic Area

Earth in the Solar System

Cognitive Domain

Reasoning

Maximum Points

1

Key

See scoring guide

Code	Response	Item: S031044
	Correct Response	
10	Earth = 2 Moon = 3 Sun = 1	
	Incorrect Response	
70	Only the Sun is correct (3 – 2 – 1)	
79	Other incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

S031390

Describe two human activities that can lead to the extinction of animals.

Activity 1:

Activity 2:

Content Domain

Life Science

Topic Area

Ecosystems

Cognitive Domain

Applying

Maximum Points

2

Key

See scoring guide

Note: Each of the two responses is coded separately. The same code may be used twice if they are based on general categories. However, if the two responses are essentially the same, the second response should be coded as 79. For example, if a response mentions "hunting animals for food" and "killing animals for skin", the first response should receive a Code 11, and the second response a Code 79. If only one response is given, the second should be coded as 99.

Two correct responses will be given 2 score points and one correct response will be given 1 score point.

Code	Response	Item: S031390A,B
	Correct Response	
10	Mentions tree felling or other land development activities (leading to loss of habitat/homes). *Examples:* *Cutting down trees.* *Building houses and roads.* *Making paper and log cabins because that cuts down the trees that are home to the animals.* *Destroying animals homes like the forests.* *Deforestation.* *Took away their home.*	
11	Mentions hunting or killing animals (for food, pelts, etc.). *Examples:* *Shooting animals and eating them.* *Hunting animals (especially rare ones).* *Catching rare animals to put them in zoos.* *Poaching.*	
12	Mentions polluting the environment (or similar). *Examples:* *Causing air pollution.* *Dumping waste into the rivers.* *Pollution.* *Causing oil spills in the ocean.*	
19	Other correct	
	Incorrect Response	
70	Mentions a human activity but connection to extinction of animals is unclear. *Examples:* *Smoking* *Playing ball with animals* *Making shoes* *Experimentation* *Walking the dog* *Gun shooting*	
79	Other incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

The table shows three functions carried out by parts of the human body.

Write the name of the body part beside its function. The first one has been done for you.

Function	Body Part
Supports the body	Skeleton
Pumps blood through the body	
Used for thinking	

S051057

Content Domain

Life Science

Topic Area

Characteristics and Life Processes of Living Things

Cognitive Domain

Knowing

Maximum Points

1

Key

See scoring guide

<table>
<tr><th colspan="2">Code</th><th>Response</th><th>Item: S051057</th></tr>
<tr><td></td><td colspan="3">Correct Response</td></tr>
<tr><td>10</td><td colspan="3">Completes the table as shown.
<table>
<tr><th>Function</th><th>Body Part</th></tr>
<tr><td>Supports the body</td><td>Skeleton</td></tr>
<tr><td>Pumps blood through the body</td><td>Heart</td></tr>
<tr><td>Used for thinking</td><td>Brain</td></tr>
</table></td></tr>
<tr><td></td><td colspan="3">Incorrect Response</td></tr>
<tr><td>70</td><td colspan="3">Identifies the heart only.</td></tr>
<tr><td>71</td><td colspan="3">Identifies the brain only.</td></tr>
<tr><td>79</td><td colspan="3">Other incorrect (including crossed out, erased, stray marks, illegible, or off task), including the following response:
Mind</td></tr>
<tr><td></td><td colspan="3">Nonresponse</td></tr>
<tr><td>99</td><td colspan="3">Blank</td></tr>
</table>

A hedgehog is a small spiny animal. When it is frightened it rolls into a ball.

How does this behavior help the hedgehog?

Ⓐ The hedgehog can roll away quickly.
Ⓑ The hedgehog looks larger rolled up.
Ⓒ The hedgehog is harder to see in a ball.
Ⓓ The hedgehog's soft body parts are covered.

S051032

Content Domain

Life Science

Topic Area

Interactions with the Environment

Cognitive Domain

Applying

Maximum Points

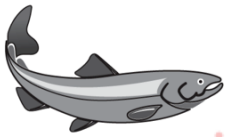
1

Key

D

Which animals shown below have a backbone?

Fill in one circle for **each** animal. One has been done for you.

Animal	Has a Backbone	
	Yes	No
 heron	●	Ⓑ
 spider	Ⓐ	Ⓑ
 crab	Ⓐ	Ⓑ
 fish	Ⓐ	Ⓑ
 lion	Ⓐ	Ⓑ

S051049

Content Domain

Life Science

Topic Area

Characteristics and Life Processes of Living Things

Cognitive Domain

Applying

Maximum Points

1

Key

A, B, B, A, A

S051033

Why are many desert animals more active at night?

Ⓐ It is drier at night.

Ⓑ It is cooler at night.

Ⓒ There is less danger at night.

Ⓓ There is less wind at night.

Content Domain

Life Science

Topic Area

Interactions with the Environment

Cognitive Domain

Applying

Maximum Points

1

Key

B

S051173

Harry grows two centimeters in one month.

Why is eating food that contains calcium important for Harry's growth?

Content Domain

Life Science

Topic Area

Human Health

Cognitive Domain

Knowing

Maximum Points

1

Key

See scoring guide

Code	Response	Item: S051173
	Correct Response	
10	Refers to calcium being needed to make (strong) bones. *Examples*: *He needs the calcium for his bones.* *His bones are growing and he needs calcium to make them.* *Eating food that contains calcium can help Harry to strengthen his bones.* *For bones* *Bones*	
	Incorrect Response	
79	Incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

S051086

Water, ice, and steam all have different temperatures.

What is the order from coldest to hottest?

Ⓐ ice, water, steam

Ⓑ ice, steam, water

Ⓒ steam, ice, water

Ⓓ steam, water, ice

Content Domain

Physical Science

Topic Area

Classification and Properties of Matter

Cognitive Domain

Knowing

Maximum Points

1

Key

A

Alice watches a sunrise from across a calm lake. She sees a sun in the sky and a sun in the lake as shown below.

Why does Alice see a sun in the lake?

Ⓐ The sunlight warms that part of the lake.
Ⓑ The sky spreads sunlight over the lake.
Ⓒ The sunlight reflects off the lake water.
Ⓓ Clouds reflect sunlight into the lake.

S051179

Content Domain

Physical Science

Topic Area

Sources and Effects of Energy

Cognitive Domain

Applying

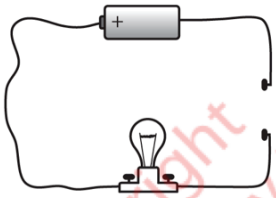
Maximum Points

1

Key

C

Gerry connects a battery, a light bulb, and some wire as shown below.



Will the bulb light?

(Check one box.)

☐ Yes

☐ No

Explain your answer.

S051074

Content Domain

Physical Science

Topic Area

Sources and Effects of Energy

Cognitive Domain

Applying

Maximum Points

1

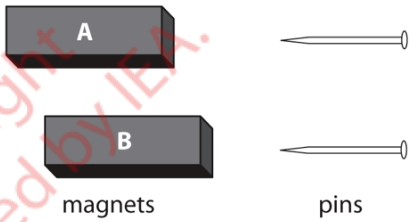
Key

See scoring guide

Code	Response	Item: S051074
	Correct Response	
10	**No** with an explanation that the bulb does not light because the circuit is incomplete. *Examples:* *No – There is a gap in the wires.* *No – The two wires on the right have to be connected.* *No – The switch is not closed so the bulb will not light.* *No – It is not a full circuit.* *No – It is not all connected.*	
	Incorrect Response	
70	**Yes** with an explanation that the bulb would light up if he were to join the wires together.	
79	Incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

Betty has two magnets (A and B) and two metal pins that are the same.

She slides Magnet A along a table until a pin is attracted to the magnet.
She slides Magnet B along a table until a pin is attracted to the magnet.



She finds that Magnet A attracts the pin from 15cm and Magnet B attracts the pin from 10cm.

Steven says that both magnets are equally strong.

Do you agree?

(Check one box.)

☐ Yes

☐ No

Explain your answer.

S051119

Content Domain

Physical Science

Topic Area

Sources and Effects of Energy

Cognitive Domain

Reasoning

Maximum Points

1

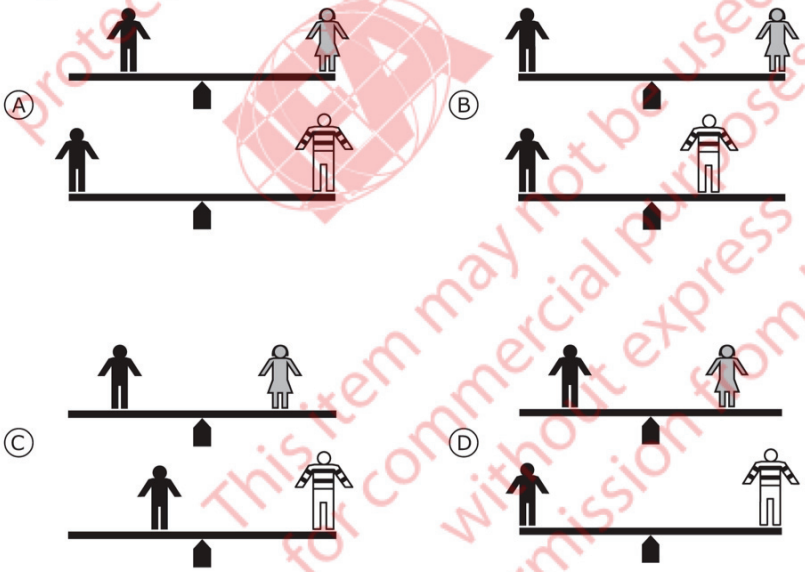
Key

See scoring guide

Code	Response	Item: S051119
	Correct Response	
10	**No** with an explanation that a stronger magnet (i.e., Magnet A) can attract the pin from a further distance. *Examples:* *No – Magnet A attracted the pin from a further distance than Magnet B, so it is stronger.* *No – Magnet B had to be closer to the pin so it is weaker.* *No – Magnet A is stronger than magnet B as A can attract the pin from 15 cm while B can attract the pin from 10 cm.*	
11	**No** with an explanation that refers to different distances only. *Examples:* *No – The magnets attract from different lengths.* *No – Because magnet A attracted the pin from a longer distance.*	
	Incorrect Response	
79	Incorrect (including crossed out, erased, stray marks, illegible, or off task), including responses that refer to the strength of the magnet only. *Examples:* *No – Magnet A is stronger.* *No – Magnet B is weak.*	
	Nonresponse	
99	Blank	

Nick rides on a seesaw with his sister Kate and then with his brother Leon. Nick is the same weight as Kate, but Leon is twice the weight of Nick.

Which figure shows where the children should sit so that Nick can balance first with Kate and then with Leon?



S051071

Content Domain

Physical Science

Topic Area

Forces and Motion

Cognitive Domain

Reasoning

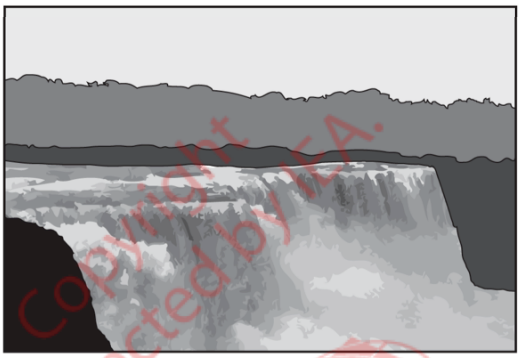
Maximum Points

1

Key

B

A river flowing over a waterfall has a lot of energy.



Which of the following is made from waterfall energy?

Ⓐ hot water
Ⓑ solar power
Ⓒ electricity
Ⓓ drinking water

S051100

Content Domain

Earth Science

Topic Area

Earth's Structure, Physical Characteristics, and Resources

Cognitive Domain

Knowing

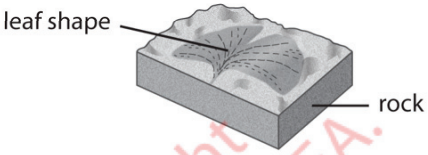
Maximum Points

1

Key

C

The leaf shape in the rock comes from a plant that lived long ago.



About how long ago was the plant alive?

Ⓐ one year
Ⓑ one hundred years
Ⓒ one thousand years
Ⓓ one million years

S051156

Content Domain

Earth Science

Topic Area

Earth's Processes, Cycles, and History

Cognitive Domain

Knowing

Maximum Points

1

Key

D

The picture shows a boat sailing.

Which force causes the boat to move?

(A) gravity
(B) wind
(C) friction
(D) magnetism

S041117

Content Domain

Physical Science

Topic Area

Forces and Motion

Cognitive Domain

Knowing

Maximum Points

1

Key

B

S041120

Which two objects produce their own light?

Ⓐ candle and moon
Ⓑ moon and mirror
Ⓒ sun and candle
Ⓓ mirror and sun

Content Domain

Physical Science

Topic Area

Sources and Effects of Energy

Cognitive Domain

Knowing

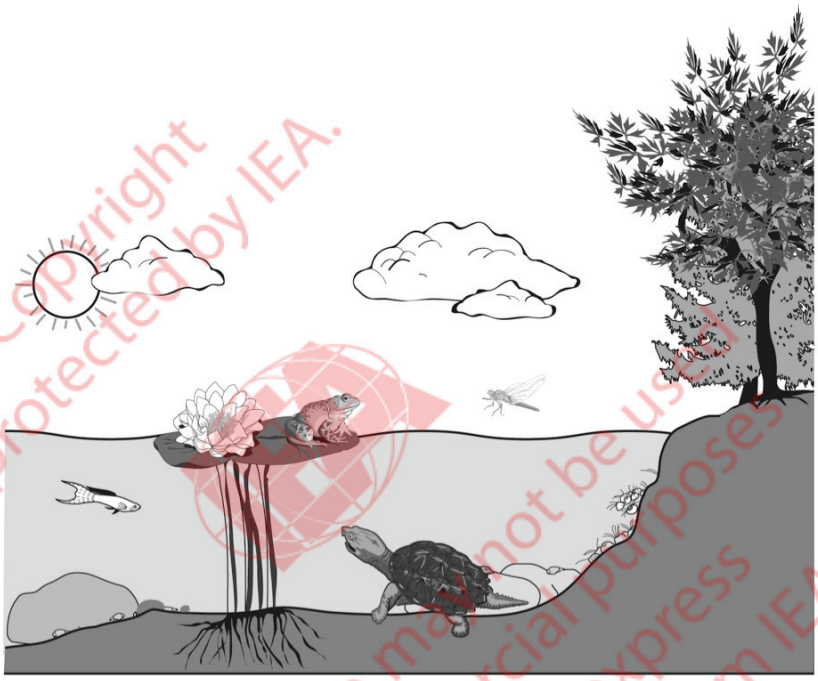
Maximum Points

1

Key

C

The picture below shows a pond.



In the spaces provided below, list three living things and three non-living things shown in this picture.

Living things	Non-living things
1.	1.
2.	2.
3.	3.

S041003

Content Domain

Life Science

Topic Area

Characteristics and Life Processes of Living Things

Cognitive Domain

Knowing

Maximum Points

1

Key

See scoring guide

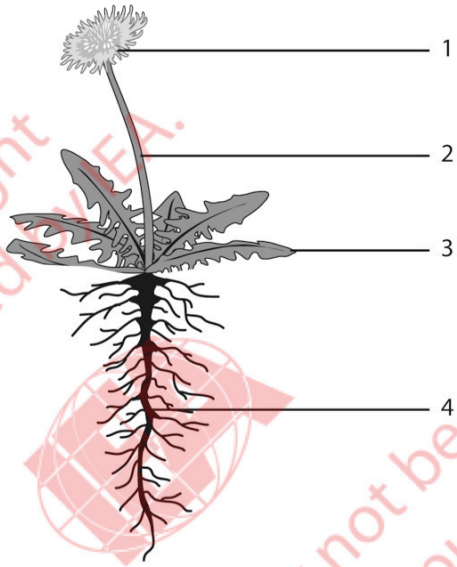
Note: i) Acceptable list of living and non-living things:

Living things	Non-living things
fish	sun
frog	clouds
turtle	water
dragonfly (insect, butterfly, fly)	rocks
water lily (plants, flowering plant, water plant)	pebbles (stones)
trees	sand
grasses	soil (dirt, earth)
molluscs (snails)	mud
	air

ii) If three living things are listed under the "non-living things" column and three non-living things are listed under the "living things" column, score as 79.

Code	Response	Item: S041003
	Correct Response	
10	Lists **three living things** in the first column and **three non-living things** in the second column from the list indicated in the note above.	
	Incorrect Response	
79	Incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

The diagram shows a flowering plant. Four of its parts are numbered.



In the table below, write the name of each part, and state its function.

Part Number	Name of Part	Function of Part
1		
2		
3		
4		

S041224

Content Domain

Life Science

Topic Area

Characteristics and Life Processes of Living Things

Cognitive Domain

Knowing

Maximum Points

2

Key

See scoring guide

Code	Response	Item: S041224
	Correct Response	
20	Identifies 4 parts of the plant and states a correct function for each. 1: Flower (bud). It produces seeds (has seed, produces fruits, makes pollen, attracts insects to the plant). 1: Seeds. They reproduce the plant when the seed germinates. 1: Petals. They attract pollinators. 2: Stem (stalk). It transports water and food (holds up the plant, carries water, transfers food and minerals to other parts, stores food). 3: Leaf. It makes food for the plant (photosynthesis takes place there, absorbs sunlight, takes in air, takes in carbon dioxide, gives off oxygen, gives off water). 4: Root. It transports water into the plant (absorbs minerals and nutrients from the ground, absorbs water, takes in water, anchors the plant, stores food).	
21	Identifies 4 parts of the plant and states 3 correct functions.	
	Partially Correct Response	
10	Identifies: 4 parts and 1 or 2 correct functions OR 3 parts and 1 or 2 or 3 correct functions OR 2 parts and 1 or 2 functions.	
	Incorrect Response	
70	Identifies 4 parts, but no correct functions.	
79	Other incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

S041163

Which group of animals contains ONLY reptiles?

Ⓐ lizard, frog, snake
Ⓑ turtle, lizard, crocodile
Ⓒ octopus, snail, turtle
Ⓓ crab, earthworm, snake

Content Domain

Life Science

Topic Area

Characteristics and Life Processes of Living Things

Cognitive Domain

Applying

Maximum Points

1

Key

B

The pictures above show two ways of traveling around town.

Which way of traveling is better for the environment?

(Check one box.)

☐ Bicycle

☐ Motorbike

Explain your answer.

S041039

Content Domain

Life Science

Topic Area

Ecosystems

Cognitive Domain

Reasoning

Maximum Points

1

Key

See scoring guide

Code	Response	Item: S041039
	Correct Response	
10	**Bicycle** with an explanation that relates to air or noise pollution. (If the explanation includes inaccurate information such as destroying the ozone layer, still credit the response). *Examples:* *It does not produce fumes like a motorbike does.* *A motorbike gives out fumes which go up into the air and pollute it. Whereas a bike does not.* *The motorbike gives off fumes which destroy the ozone layer and so the bicycle is better for the environment.* *The motorbike gives out dirty gases.* *No pollution is given off.* *It is not noisy like a motor cycle.* *It is very quiet.*	
	Incorrect Response	
70	**Bicycle** with a general explanation. *Examples:* *My answer is a bicycle because it does not use gas.* *A bicycle because a motorbike uses limited resources.*	
79	Other incorrect (including crossed out, erased, stray marks, illegible, or off task) *Examples:* *A bicycle because it gives you exercise.*	
	Nonresponse	
99	Blank	

S041014

Some plants produce fruit such as apples.

What is one function of a fruit?

Ⓐ to protect seeds
Ⓑ to produce food for seeds
Ⓒ to stop seeds from dispersing
Ⓓ to store water for seed germination

Content Domain

Life Science

Topic Area

Characteristics and Life Processes of Living Things

Cognitive Domain

Applying

Maximum Points

1

Key

A

S041181

How can influenza be passed from person to person?

Content Domain

Life Science

Topic Area

Human Health

Cognitive Domain

Applying

Maximum Points

1

Key

See scoring guide

Code	Response	Item: S041181
	Correct Response	
10	Mentions coughing or sneezing. *Examples:* *If you sneeze on your friend the germs can be passed on.* *Influenza is passed by someone coughing or sneezing on someone.* *When one sneezes or coughs directly on the other person.* *By standing next to someone who is sneezing.* *By coughing or sneezing.*	
11	Mentions touching the same object, using the same utensils, or having physical contact with a person who has influenza. *Examples:* *Influenza can be passed by sharing food and drinks.* *By shaking hands.*	
19	Other correct *Examples:* *It is passed in the air.* *Breathing in someone else's air.*	
	Incorrect Response	
70	Mentions being near someone with influenza but does not mention coughing, sneezing, or any direct contact. *Examples:* *It can be passed by going near to someone with influenza.* *It can spread when people sit together.*	
79	Other incorrect (including crossed out, erased, stray marks, illegible, or off task) *Examples:* *If someone is sick and he has influenza, it gets passed around from person to person.*	
	Nonresponse	
99	Blank	

S041174

How does migration increase the survival of birds?

Content Domain

Life Science

Topic Area

Interactions with the Environment

Cognitive Domain

Applying

Maximum Points

1

Key

See scoring guide

Code	Response	Item: S041174
	Correct Response	
10	Refers to finding food and/or reproduction. *Examples:* *Move from one region to another for feeding or breeding.* *Some of the birds find food or a place to build their nest.* *Food may become scarce so the birds move to an area where there is more food.* *They migrate so that they are in an area that helps their young survive.* *Birds migrate to find a safe place to breed.* *When a place gets too cold for a bird, it migrates to a warmer place to live. Birds also migrate during the mating season.*	
11	Refers to moving to a warmer place without mention of food or reproduction. *Examples:* *Birds living in a country with winter will die in the cold. They will migrate to a place where it is summer or spring.* *It provides warm weather for the birds.* *They migrate to warmer places.*	
	Incorrect Response	
79	Incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

The table below shows the properties of two materials.

Properties of Material 1	Properties of Material 2
Conducts heat quickly	Conducts heat slowly
Solid	Solid
Does not dissolve in water	Dissolves in water
Attracted by magnets	Not attracted by magnets

Which statement about materials 1 and 2 is **most** likely to be correct?

Ⓐ Material 1 is glass, and material 2 is clay.
Ⓑ Material 1 is copper, and material 2 is wood.
Ⓒ Material 1 is iron, and material 2 is sugar.
Ⓓ Material 1 is cork, and material 2 is gold.

S041049

Content Domain

Physical Science

Topic Area

Classification and Properties of Matter

Cognitive Domain

Reasoning

Maximum Points

1

Key

C

S041208

How often does Earth rotate on its axis?

Ⓐ once every 12 hours
Ⓑ once every 24 hours
Ⓒ once every month
Ⓓ once every year

Content Domain

Earth Science

Topic Area

Earth in the Solar System

Cognitive Domain

Knowing

Maximum Points

1

Key

B

Diagram 1 shows a container X that is filled with a material that could be a solid, liquid, or gas. The container has been sealed with a glass sheet. Container X is placed upside down on an empty container Y, as shown in Diagram 2.

Diagram 1

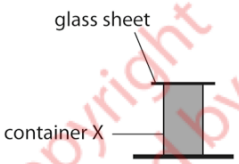
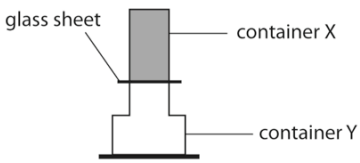


Diagram 2

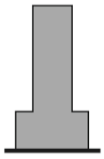


The glass sheet is removed.

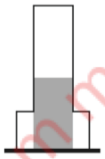
Which of the diagrams below shows what you would see if the material in container X is a gas?

(Check one box.)

☐ Diagram 3



☐ Diagram 4



☐ Diagram 5

Explain your answer.

S041060

Content Domain

Physical Science

Topic Area

Classification and Properties of Matter

Cognitive Domain

Applying

Maximum Points

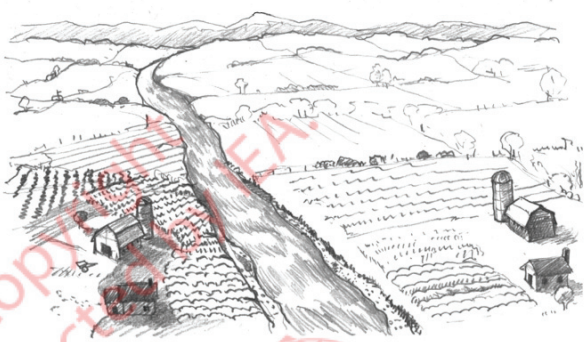
1

Key

See scoring guide

Code	Response	Item: S041060
	Correct Response	
10	**Diagram 3** and explains that gases expand (or increase in volume) OR that they fill a container (rise up/spread out to take the shape of a container) OR have no definite shape. *Examples:* *Gas does not have a definite volume or shape.* *Gas would fill the space.* *Particles move away from each other.*	
	Incorrect Response	
70	**Diagram 3** with an incorrect or no explanation. *Examples:* *Diagram 3: It looks like a gas.*	
71	**Diagram 4** with or without an explanation.	
72	**Diagram 5** with or without an explanation.	
79	Other incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

The picture below shows a river flowing across a plain.



Farming is carried out on the plain and near the river.

There are advantages and disadvantages to farming along a river.

A. Describe one **advantage**.

B. Describe one **disadvantage**.

S041201

Content Domain

Earth Science

Topic Area

Earth's Structure, Physical Characteristics, and Resources

Cognitive Domain

Applying

Maximum Points

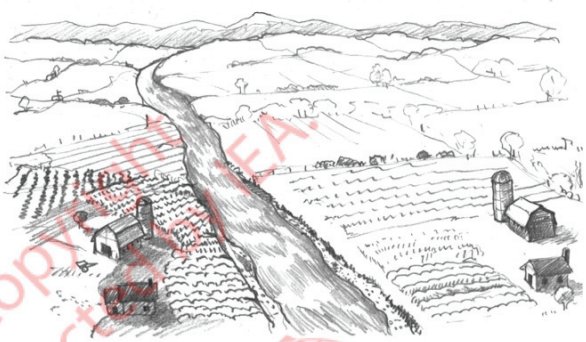
1

Key

See scoring guide

Code	Response	Item: S041201A
	Correct Response	
10	Refers to the availibility of water (for crops and/or animals) OR presence of fertile soil OR ability to grow better crops. *Examples:* *Lots of water for irrigation.* *They can water their crops easily.* *You would be able to get water for animals.* *You can get water.* *The soil is fertile.* *Fertile soil is deposited each year.* *Good soil to grow vegetables.* *You could grow better crops.*	
	Incorrect Response	
79	Incorrect (including crossed out, erased, stray marks, illegible, or off task) *Examples:* *Having enough water for washing.* *You can catch fish.* *The crops will grow.*	
	Nonresponse	
99	Blank	

The picture below shows a river flowing across a plain.



Farming is carried out on the plain and near the river.

There are advantages and disadvantages to farming along a river.

A. Describe one **advantage**.

B. Describe one **disadvantage**.

S041201

Content Domain

Earth Science

Topic Area

Earth's Structure, Physical Characteristics, and Resources

Cognitive Domain

Applying

Maximum Points

1

Key

See scoring guide

Code	Response	Item: S041201B
	Correct Response	
10	Refers to the river flooding/overflowing OR the river being polluted/carrying pollutants OR animals falling into the river. *Examples:* *The river could flood.* *The river could flood and cover the crops with mud.* *The river could flood and wash the buildings away.* *The water could wash the crops away.* *Pollutants could be carried to the farm by the river.* *Pollutions can flow from the fields down into the river.* *The water may be poisoned.* *Water in the rivers may be dirty or polluted.* *Animals might fall in and get hurt.*	
	Incorrect Response	
79	Incorrect (including crossed out, erased, stray marks, illegible, or off task) *Examples:* *In the winter the water freezes over and you go skating and fall in.* *Something will fall into the water.* *The river is dangerous.* *Mud.* *The river can create new ways into the farming land.* *The river gets in the way and makes it difficult to do things.* *Makes it difficult to harvest.*	
	Nonresponse	
99	Blank	

S031340

Calcium is a mineral that helps make your bones and teeth strong.
Which of these foods is the best source of calcium?

Ⓐ candy
Ⓑ rice
Ⓒ cheese
Ⓓ meat

Content Domain

Life Science

Topic Area

Human Health

Cognitive Domain

Knowing

Maximum Points

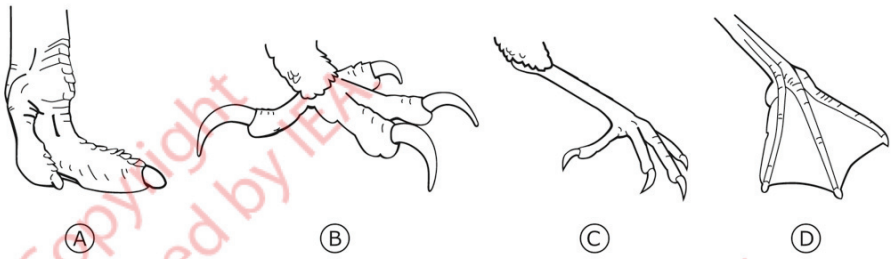
1

Key

C

S031236

A bird that lives on a pond is most likely to have which of these foot structures?



Content Domain

Life Science

Topic Area

Interactions with the Environment

Cognitive Domain

Knowing

Maximum Points

1

Key

D

S031391

There is a shortage of fresh water in many parts of the world.
Describe two things people can do to avoid wasting water.

1.

2.

Content Domain

Earth Science

Topic Area

Earth's Structure, Physical Characteristics, and Resources

Cognitive Domain

Knowing

Maximum Points

2

Key

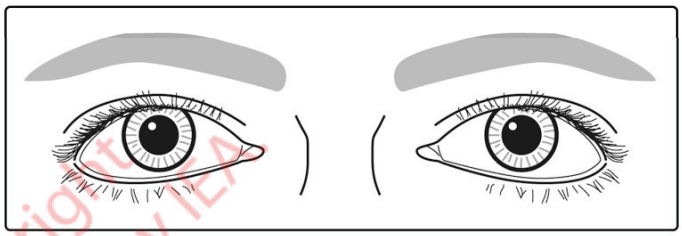
See scoring guide

Note: Each of the two responses is coded separately. The same code may be used twice if they are based on general categories. However, if the two responses are essentially the same, the second response should be coded as 79. For example, if a response mentions "take shorter showers" and "use less bath water", the first response should be given a Code 12, and the second response should be given a Code 79. If only one response is given, the second should be coded as 99.

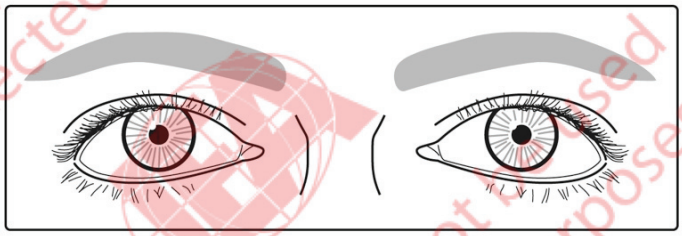
Two correct responses will be given 2 score points and one correct response will be given 1 score point.

Code	Response	Item: S031391A,B
	Correct Response	
10	Mentions that faucets should not be left running (or similar). *Examples:* *Don't leave the water running.* *Turn off the water when you are not using it.* *Stop water from leaking from the faucet.*	
11	Mentions recycling, reusing or purifying water (or similar). *Examples:* *Screen out dirt so you can drink the water.* *Don't dump the bath water. Use it to water your plants.* *Save the water until you really need it.* *Don't pollute the rivers so you can drink the water.* *Reuse the water to wash rice to clean the floor.*	
12	Mentions a specific practical method to conserve or minimize the use of water. *Examples:* *Have short showers.* *Be careful and don't spill any water.* *Don't play in the sprinklers.* *Only wash your car once a month.* *Don't use it for things like filling your swimming pool.* *Put a ban on watering your lawn.* *Water your garden at night.* *Use less water to wash your hands.* *Use half-flush to flush the toilet.*	
19	Other correct	
	Incorrect Response	
70	Gives a general/vague statement about not using or drinking (much) water. [No specific method given.] *Examples:* *Stop using water.* *Don't drink it.* *Use a limited amount.*	
79	Other incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

Picture 1



Picture 2



Picture 1 and Picture 2 show the same eyes in different outside conditions.
What outside condition is different between Picture 1 and Picture 2?

Ⓐ Light is brighter in Picture 1.

Ⓑ Light is brighter in Picture 2.

Ⓒ Temperature is higher in Picture 1.

Ⓓ Temperature is higher in Picture 2.

S031361

Content Domain

Life Science

Topic Area

Interactions with the Environment

Cognitive Domain

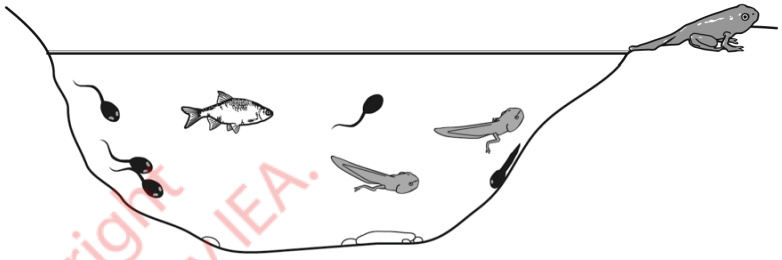
Reasoning

Maximum Points

1

Key

B



Melissa found some tadpoles and fish in a pond as shown above.
How did the tadpoles get there?

Ⓐ They hatched from eggs laid by fish in the pond.

Ⓑ They formed from mud at the bottom of the pond.

Ⓒ They were made from materials dissolved in pond water.

Ⓓ They developed from eggs laid by frogs in the pond.

S031001

Content Domain

Life Science

Topic Area

Life Cycles, Reproduction, and Heredity

Cognitive Domain

Applying

Maximum Points

1

Key

D

S031410

Which of these is a mixture?

Ⓐ salt water
Ⓑ sugar
Ⓒ water vapor
Ⓓ salt

Content Domain

Physical Science

Topic Area

Classification and Properties of Matter

Cognitive Domain

Knowing

Maximum Points

1

Key

A

S031421

Some of the materials below will burn and some will not.
Put an X in the box next to the materials that will burn.

(You may put an X in more than one box.)

- ☐ water
- ☐ wood
- ☐ sand
- ☐ gasoline
- ☐ air

Content Domain

Physical Science

Topic Area

Classification and Properties of Matter

Cognitive Domain

Knowing

Maximum Points

1

Key

See scoring guide

Code	Response	Item: S031421
	Correct Response	
10	**Wood** AND **Gasoline** (no incorrect materials are checked).	
	Incorrect Response	
70	**Wood** AND **Air** (no other materials are checked)	
71	**Gasoline** AND **Air** (no other materials are checked)	
72	**Water** OR **Sand** (even if correct materials are also checked).	
79	Other incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

S031298

A hot, boiled egg is put into a cup of cold water. What happens to the temperature of the water and the egg?

Ⓐ The water gets colder and the egg gets warmer.

Ⓑ The water gets warmer and the egg gets colder.

Ⓒ The water temperature stays the same and the egg gets colder.

Ⓓ Both the water and the egg get warmer.

Content Domain

Physical Science

Topic Area

Sources and Effects of Energy

Cognitive Domain

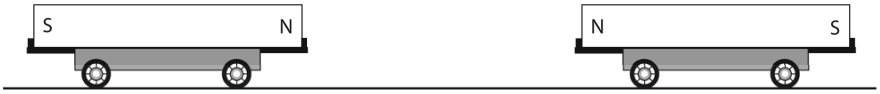
Applying

Maximum Points

1

Key

B



The figure shows two carts, each holding a magnet. The carts are moved close together and then let go.

Describe what will happen to the carts.

(You may draw a picture to help explain your answer.)

S031076

Content Domain

Physical Science

Topic Area

Sources and Effects of Energy

Cognitive Domain

Reasoning

Maximum Points

1

Key

See scoring guide

Code	Response	Item: S031076
	Correct Response	
10	Refers to carts repelling, moving apart from each other, or NOT being attracted to each other (or similar). [May draw diagram to indicate this.] *Examples:* *The magnets repel because two north poles pull apart.* *They will push each other away.* *The carts will spread apart.* *The two carts will not stick together.* *They are not N-S so they will not stay together.* *North and North will repel and the carts will turn.* *If one cart turns around then the two carts will stick together.* **Note**: May also indicate that one cart will flip/turn so that North/South poles are attracted.	
	Incorrect Response	
70	Refers **only** to the two carts being attracted WITHOUT any mention of turning so N-S poles are attracted. *Examples:* *They will stick together.* *The two poles of the magnets will attract.*	
79	Other incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

S031275

What is the correct explanation for why we have day and night on Earth?

Ⓐ The Sun orbits around the Earth.

Ⓑ Earth orbits around the Sun.

Ⓒ Earth turns on its axis.

Ⓓ The Sun turns on its axis.

Content Domain

Earth Science

Topic Area

Earth in the Solar System

Cognitive Domain

Applying

Maximum Points

1

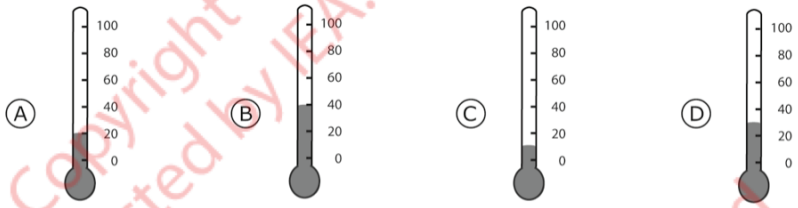
Key

C

S041311

Four different thermometers were used to measure the temperature of water in four different beakers.

Which thermometer reading belongs to the hottest water?



Content Domain

Physical Science

Topic Area

Sources and Effects of Energy

Cognitive Domain

Applying

Maximum Points

1

Key

B

S041178

Plants use energy directly from the sun.

What do they use the energy from the sun for?

Ⓐ to make food
Ⓑ to disperse seeds
Ⓒ to fertilize the soil
Ⓓ to prevent insect damage

Content Domain

Life Science

Topic Area

Ecosystems

Cognitive Domain

Knowing

Maximum Points

1

Key

A

S041182

Marcie is playing a board game with a friend who has the flu.

Write down one thing Marcie can do to avoid catching the flu from her friend.

Content Domain

Life Science

Topic Area

Human Health

Cognitive Domain

Applying

Maximum Points

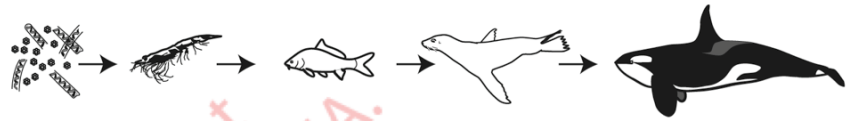
1

Key

See scoring guide

Code	Response	Item: S041182
	Correct Response	
10	States one acceptable reason. *Examples:* *Marcie can wash her hands.* *Marcie can cover her nose and mouth with a mask.* *Marcie can tell her friend to wear a mask.* *Marcie can avoid being coughed on, sneezed on, breathed on.* *Marcie can tell her friend to cover her mouth when she coughs or sneezes.* *Marcie can wear gloves.* *Marcie should not touch her face.* *Marcie should not share food or drink out of the same glass.* *Marcie should not touch the same things as her friend.* *Marcie should not shake hands with her friend.*	
	Incorrect Response	
79	Incorrect (including crossed out, erased, stray marks, illegible, or off task) *Examples:* *Don't sit near to her.* *Get a flu jab.* *Marcie should sit opposite her friend.*	
	Nonresponse	
99	Blank	

The diagram below shows a food chain.



green algae krill fish seal killer whale

Which predator–prey relationship is correct?

Ⓐ fish (predator)–seal (prey)
Ⓑ green algae (predator)–krill (prey)
Ⓒ fish (predator)–krill (prey)
Ⓓ seal (predator)–killer whale (prey)

S041180

Content Domain

Life Science

Topic Area

Ecosystems

Cognitive Domain

Applying

Maximum Points

1

Key

C

S041187

Which of the following describes condensation?

Ⓐ a liquid changing to a solid
Ⓑ a solid changing to a liquid
Ⓒ a solid changing to a gas
Ⓓ a gas changing to a liquid

Content Domain

Physical Science

Topic Area

Classification and Properties of Matter

Cognitive Domain

Knowing

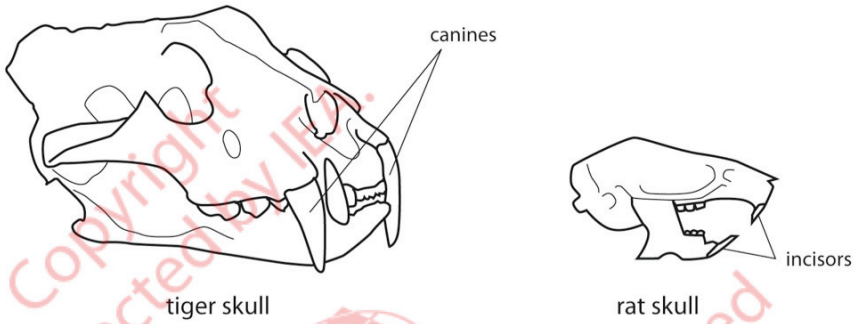
Maximum Points

1

Key

D

The diagrams show a tiger skull and a rat skull.



A tiger has very large teeth called canines. A rat has very large teeth called incisors. A tiger and a rat eat different types of food.

A. What does a tiger use its canines for?

B. What does a rat use its incisors for?

S041013

Content Domain

Life Science

Topic Area

Characteristics and Life Processes of Living Things

Cognitive Domain

Applying

Maximum Points

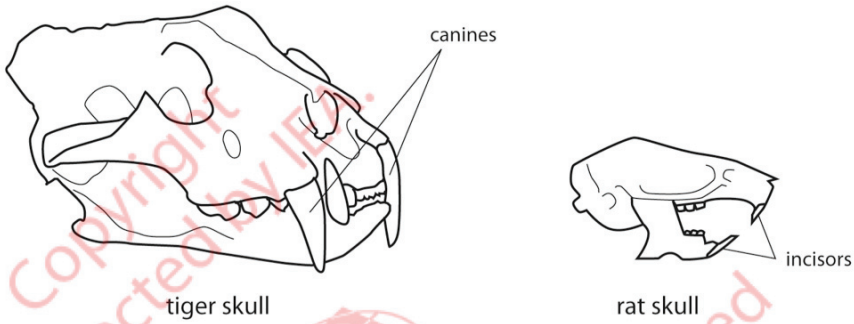
1

Key

See scoring guide

Code	Response	Item: S041013A
	Correct Response	
10	States that the tiger uses its canines for piercing (stabbing, holding, ripping, killing, tearing) prey. *Examples:* *A tiger uses its canines to hold onto its prey and kill it.* *The tiger stabs its prey with the canines and rips the meat.* *The tiger uses its canines to kill prey.* *Biting into animals and killing them.* *A tiger uses its canines to grip its prey.*	
	Incorrect Response	
70	States that the tiger uses its canines for chewing (crushing, grinding) food. *Examples:* *The tiger grinds the bones.* *A tiger uses its canines for chewing its prey.* *The tiger uses its canines to chew through tough flesh and muscles and organs.* *For crushing bones.* *For crushing prey.*	
79	Other incorrect (including crossed out, erased, stray marks, illegible, or off task) *Examples:* *The tiger uses its canines for hunting down prey.* *To eat his prey.* *To devour its prey.* *The tiger uses them for meat.* *To catch its prey.* *To cut up food.* *The tiger bites its prey.*	
	Nonresponse	
99	Blank	

The diagrams show a tiger skull and a rat skull.



A tiger has very large teeth called canines. A rat has very large teeth called incisors. A tiger and a rat eat different types of food.

A. What does a tiger use its canines for?

B. What does a rat use its incisors for?

S041013

Content Domain

Life Science

Topic Area

Characteristics and Life Processes of Living Things

Cognitive Domain

Applying

Maximum Points

1

Key

See scoring guide

Code	Response	Item: S041013B
	Correct Response	
10	States that the rat uses its incisors for gnawing (nibbling) food or killing prey. *Examples:* *The rat uses them to gnaw nuts, grains, meat, and vegetable matter.* *They use them to nibble food.* *The rat uses its incisors for biting hard stuff.* *To bite the heads off prey.* *They are used for killing young birds.*	
	Incorrect Response	
70	States that the rat uses its incisors for chewing (crushing, grinding, cutting, chopping, munching) food. *Examples:* *Rats use their incisors for chewing softer things.* *Rats chew their food using their incisors.* *Rats use them to grind food.* *Rats use them for crushing nuts and grain.* *For munching food.*	
79	Other incorrect (including crossed out, erased, stray marks, illegible, or off task) *Examples:* *It uses them for vegetables.* *For catching prey.* *The rat bites food.*	
	Nonresponse	
99	Blank	

S041067

What type of energy runs the objects shown above?

Content Domain

Physical Science

Topic Area

Sources and Effects of Energy

Cognitive Domain

Knowing

Maximum Points

1

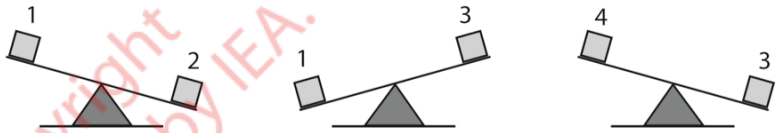
Key

See scoring guide

Code	Response	Item: S041067
	Correct Response	
10	States that **electrical energy** runs the objects shown in the diagram. *Examples:* *They run by electrical energy.* *They all plug into electricity.* *Electricity.*	
	Incorrect Response	
79	Incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

Stephanie has a balance and four cubes (1, 2, 3, 4). The cubes are made of different materials.

She puts two cubes at a time on the balance and observes the following results.



What can she conclude about the weight of cube 2?

(A) It is heavier than cubes 1, 3, and 4.
(B) It is heavier than cube 1 but lighter than cubes 3 and 4.
(C) It is heavier than cube 3 but lighter than cubes 1 and 4.
(D) It is heavier than cube 4 but lighter than cubes 1 and 3.

S041305

Content Domain

Physical Science

Topic Area

Forces and Motion

Cognitive Domain

Reasoning

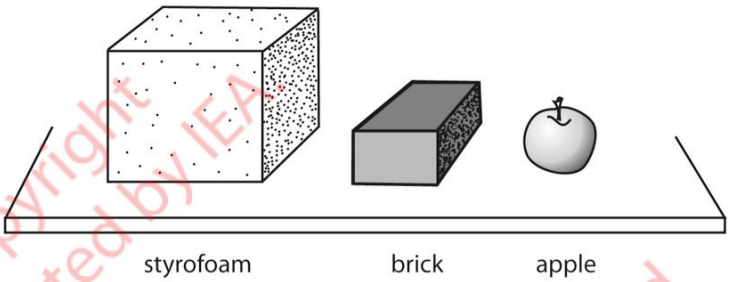
Maximum Points

1

Key

A

Jack's teacher places three objects on a table, as shown below. She puts them in order according to their volume.



Jack thinks that objects with more volume weigh more.

Do you agree with him?

(Check one box.)

☐ Yes

☐ No

Explain your answer.

S041048

Content Domain

Physical Science

Topic Area

Classification and Properties of Matter

Cognitive Domain

Reasoning

Maximum Points

1

Key

See scoring guide

Code	Response	Item: S041048
	Correct Response	
10	**No** with an explanation based on weight and/or denseness of material. *Examples:* *Styrofoam is much larger than the other two objects and it probably does not weigh as much.* *The brick has a smaller volume but it probably weighs more than the Styrofoam.* *The styrofoam is the least dense but it has more volume than the other two.* *The brick is denser than the styrofoam.* *An object like a brick is smaller and heavier because styrofoam has air in it and the brick doesn't.* *The styrofoam is the biggest but also the lightest. The brick is the second object with the most volume, but also the heaviest.* *It depends on what it is made of.*	
	Incorrect Response	
70	**No** with an incorrect or no explanation.	
71	**Yes** with an explanation based on objects with more volume weighing more. *Examples:* *The styrofoam is bigger so it has to weigh more.* *It has to have volume to weigh more.*	
79	Other incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

S041110

Write down one form of energy Earth receives from the sun.

Content Domain

Earth Science

Topic Area

Earth in the Solar System

Cognitive Domain

Knowing

Maximum Points

1

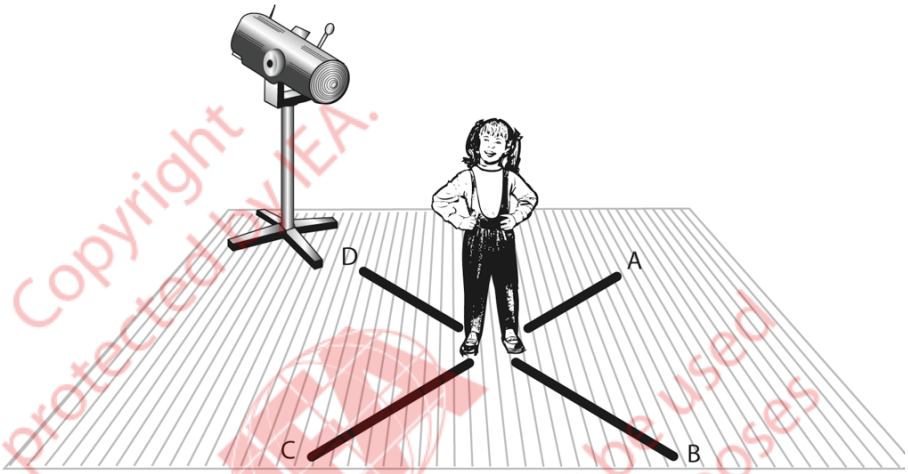
Key

See scoring guide

Note: i) If specific parts of the electromagnetic spectrum are named (e.g., uv or infrared), these should be given Code 10.
ii) If incorrect forms of energy are included score for the correct form. For example, heat and pressure should be given Code 11.

Code	Response	Item: S041110
	Correct Response	
10	Refers to light (sunlight). *Examples:* *It provides light.* *Light.* *Light energy.* *Sunlight.*	
11	Refers to heat. *Examples:* *It provides heat.* *Heat.* *The sun gives us heat to make us warm.* *Heat and pressure.* *Warmth.* *Hotness.*	
12	Refers to solar energy. *Examples:* *Solar energy.*	
	Incorrect Response	
79	Incorrect (including crossed out, erased, stray marks, illegible, or off task) *Examples:* *Energy from the sun.* *Sun.*	
	Nonresponse	
99	Blank	

A spotlight shines on a girl on a stage.



The shadow would be seen along which line?

Ⓐ A
Ⓑ B
Ⓒ C
Ⓓ D

S041069

Content Domain

Physical Science

Topic Area

Sources and Effects of Energy

Cognitive Domain

Applying

Maximum Points

1

Key

B

S041100

The direction water flows in a river depends on

Ⓐ the length of the river
Ⓑ the slope of the land
Ⓒ the type of rock over which the water flows
Ⓓ the location of the North Pole

Content Domain

Earth Science

Topic Area

Earth's Processes, Cycles, and History

Cognitive Domain

Knowing

Maximum Points

1

Key

B

S041092

Water that has its salt removed before it can be used as drinking water is most likely to have come from

Ⓐ underground
Ⓑ a river
Ⓒ a lake
Ⓓ a sea

Content Domain

Earth Science

Topic Area

Earth's Structure, Physical Characteristics, and Resources

Cognitive Domain

Knowing

Maximum Points

1

Key

D

S031254

Which of these animals has a young form that looks the most like the adult form?

Ⓐ moth
Ⓑ human
Ⓒ frog
Ⓓ butterfly

Content Domain

Life Science

Topic Area

Life Cycles, Reproduction, and Heredity

Cognitive Domain

Knowing

Maximum Points

1

Key

B

Some animals are very rare. For example, there are very few Siberian tigers. If the only Siberian tigers left are female, what will most likely happen?

Ⓐ The females will find another type of male animal to mate with and produce more Siberian tigers.

Ⓑ The females will mate with each other and produce more Siberian tigers.

Ⓒ The females will only be able to produce female Siberian tigers.

Ⓓ The females will not be able to produce more Siberian tigers, and they will die out.

S031266

Content Domain

Life Science

Topic Area

Life Cycles, Reproduction, and Heredity

Cognitive Domain

Reasoning

Maximum Points

1

Key

D

Monkey

Crocodile

Grasshopper

Octopus

Answer the following questions using the animals shown above. Write the name for the correct animal in the spaces below.

Which animal has an internal skeleton and produces milk for its young?

_____

Which animal has an external skeleton and three pairs of legs?

_____

Which animal has a soft body and no skeleton?

_____

S031233

Content Domain

Life Science

Topic Area

Characteristics and Life Processes of Living Things

Cognitive Domain

Applying

Maximum Points

1

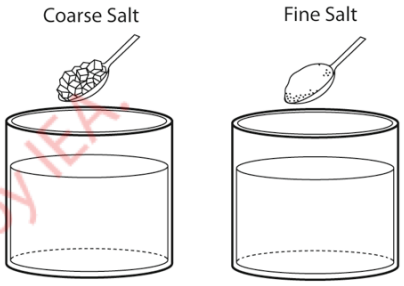
Key

See scoring guide

Note: To receive credit, ALL three animals must be correct. If any animal is listed more than once, none of the entries for that animal will be considered as correct. For example, a response of monkey, octopus, octopus is given Code 70, and a response of monkey, monkey, monkey is given a Code 79.

Code	Response	Item: S031233
	Correct Response	
10	Identifies all 3 animals in the correct order: monkey grasshopper octopus	
	Incorrect Response	
70	Identifies one animal correctly.	
71	Identifies two animals correctly.	
79	Other incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

Coarse salt and fine salt are added to water and then stirred as shown in the picture.



Which statement is true?

(Check one box.)

- ☐ Coarse salt will dissolve faster.
- ☐ Fine salt will dissolve faster.
- ☐ They both will dissolve in the same amount of time.

Explain your answer.

S031204

Content Domain

Physical Science

Topic Area

Classification and Properties of Matter

Cognitive Domain

Applying

Maximum Points

1

Key

See scoring guide

Code	Response	Item: S031204
	Correct Response	
10	**FINE** with an explanation based on smaller particles dissolving faster (or similar). *Examples:* *The fine salt has the smallest size of crystals, so they will dissolve faster.* *The coarse salt is in big blocks that do not dissolve very well.* *The fine salt is already partly broken down.* *Fine salt is broken up like powder.* *Fine salt is thinner and easy to dissolve while coarse salt is thick and hard to dissolve.* *Fine salt dissolves faster because it is not in cubes and it just has to dissolve. The other one has to make itself fine salt first.* *Fine salt is powdered and thinner.* *It's little cubes instead of fat cubes.* *Because fine salt is not chunky.* *Fine salt is in smaller pieces.* *Fine salt will dissolve faster because it is finer.*	
	Incorrect Response	
70	**FINE** with no explanation or an incorrect explanation. [May include a true statement that does not answer the question.] *Examples:* *The fine salt is lighter.* *Coarse salt is hard and fine salt is smooth.* *It is more easy to dissolve.* *Fine salt does not have any coarse in it.* *Because fine salt is better than coarse salt.* *Fine will not take as long to dissolve.*	
71	**COARSE** with or without explanation.	
72	**BOTH** with or without explanation.	
79	Other incorrect (including crossed out, erased, stray marks, illegible or off task)	
	Nonresponse	
99	Blank	

S031273

A metal spoon and a wooden spoon are used to stir a pot of hot soup. After a few minutes, the metal spoon feels hotter than the wooden spoon. What explains this?

Ⓐ Metal is always hotter than wood.

Ⓑ Metal conducts heat better than wood.

Ⓒ Metal conducts electricity better than wood.

Ⓓ Metal heats up the water better than the wood.

Content Domain

Physical Science

Topic Area

Sources and Effects of Energy

Cognitive Domain

Applying

Maximum Points

1

Key

B

S031299

Name one thing you have seen that shows that sunlight is made up of different colors.

Content Domain

Physical Science

Topic Area

Sources and Effects of Energy

Cognitive Domain

Knowing

Maximum Points

1

Key

See scoring guide

Note: Priority should be given to Code 10, then Code 11. If a response mentions prism or rainbow, then Code 10 or 11 should be given even if other correct codes also apply.

Code	Response	Item: S031299
	Correct Response	
10	Refers to a prism (or equivalent). *Examples:* *Light shining into broken glass.* *Torch shining on a piece of crystal.* *The sunlight has hit my glasses and looked different colors in the glare.* *I put a prism in the sun and a rainbow appeared.*	
11	Refers to a rainbow.	
12	Refers to sunset or sunrise (or similar). *Examples:* *When the sun goes down.* *Sunset and sunrise.* *At sunset the sun sky turns red.*	
19	Other correct *Examples:* *Soap bubbles.* *Oil slicks.*	
	Incorrect Response	
79	Incorrect (including crossed out/erased, stray marks, illegible, or off task) *Examples:* *Day and night.* *Glass* *Mirror* *Rain.* *Water.*	
	Nonresponse	
99	Blank	

S031281

Most birds sit on their eggs until they hatch. Which of these is the most important reason why birds sit on their eggs?

Ⓐ to keep the eggs inside the nest
Ⓑ to keep the eggs warm
Ⓒ to protect the eggs from the wind
Ⓓ to protect the eggs from the rain

Content Domain

Life Science

Topic Area

Interactions with the Environment

Cognitive Domain

Knowing

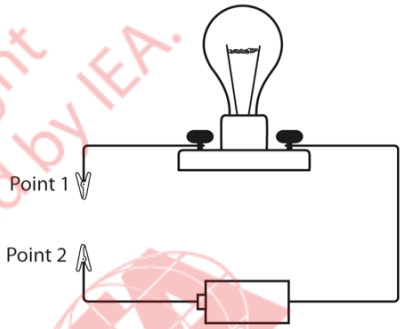
Maximum Points

1

Key

B

The following picture shows a lightbulb connected to a battery in an electrical circuit. Which of the following objects connected to Points 1 and 2 will allow the bulb to glow?



Ⓐ iron nail
Ⓑ plastic spoon
Ⓒ rubber band
Ⓓ wooden stick

S031077

Content Domain

Physical Science

Topic Area

Sources and Effects of Energy

Cognitive Domain

Applying

Maximum Points

1

Key

A

S031311

What causes an object to fall to the ground when you let it drop from your hand?

Ⓐ magnetism
Ⓑ gravity
Ⓒ air resistance
Ⓓ the push from your hand

Content Domain

Physical Science

Topic Area

Forces and Motion

Cognitive Domain

Knowing

Maximum Points

1

Key

B

S031088

Air is important for many things. What are two ways we use air?

1.

2.

Content Domain

Earth Science

Topic Area

Earth's Structure, Physical Characteristics, and Resources

Cognitive Domain

Knowing

Maximum Points

2

Key

See scoring guide

Note: To receive credit, responses must state a specific way air is used by humans. The same code may be used twice if they are based on general categories. However, if two responses are essentially the same, the second response should be coded as 79. For example, if a response mentions "inflating tires" and "blowing up balloons", the first response should be given a Code 12, and the second should be given a Code 79. If only one response is given, the second should be coded as 99.

Two correct responses will be given 2 score points and one correct response will be given 1 score point.

Code	Response	Item: S031088 A,B
	Correct Response	
10	States that air (oxygen) is needed for breathing. *Examples:* *Humans breathe air.* *It has our oxygen in it.*	
11	States that air (oxygen) is needed for fire, burning (or similar). *Examples:* *Air is used in fire.* *To burn wood.*	
12	States that air is used to inflate things (e.g., balloons, balls, tires, blow bubbles, etc.). *Examples:* *To blow up balloons.* *To inflate tires.* *To blow things up.*	
13	States an effect due to air movement or pressure (or similar). *Examples:* *Air is needed for airplanes to fly.* *For windmills.* *For fans to work they blow cool air.* *If there was no air pressure our bodies would blow up.*	
19	Other correct	
	Incorrect Response	
70	Response too vague. *Examples:* *To stay alive.* *To do experiments.* *To help machines.* *To cool down.*	
71	Refers only to plants needing air (or similar). *Examples:* *To keep plants alive.*	
79	Other incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

S031389

Which of these soil changes is due only to natural causes?

Ⓐ Loss of minerals due to farming.

Ⓑ Deserts forming due to tree cutting.

Ⓒ Flooding due to dam construction.

Ⓓ Minerals washing out due to heavy rain.

Content Domain

Earth Science

Topic Area

Earth's Structure, Physical Characteristics, and Resources

Cognitive Domain

Knowing

Maximum Points

1

Key

D

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