Texas STAAR 2018 Grade 5 Science

Exam Materials
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Answer Key Materials
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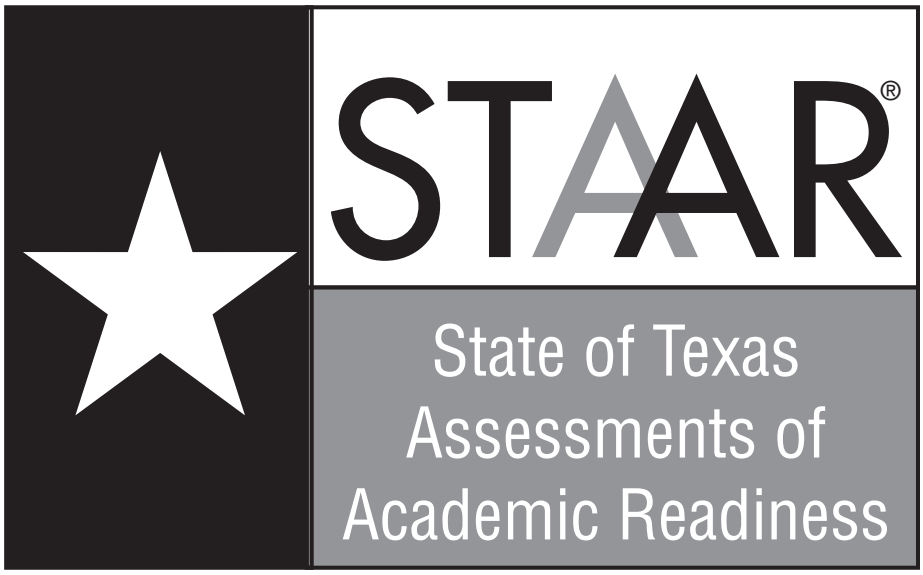


GRADE 5

Science

Administered May 2018

RELEASED

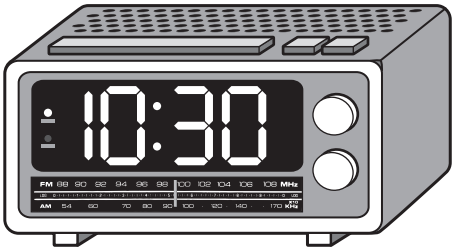
DIRECTIONS

Read each question carefully. Determine the best answer to the question from the four answer choices provided. Then fill in the answer on your answer document.

1 Which of these devices is the only one NOT designed to produce both sound and light energy?

A

C



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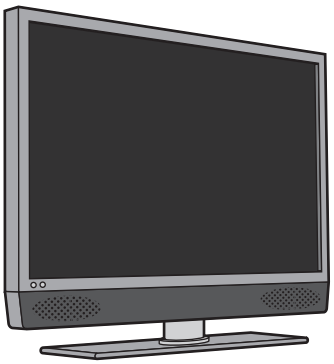
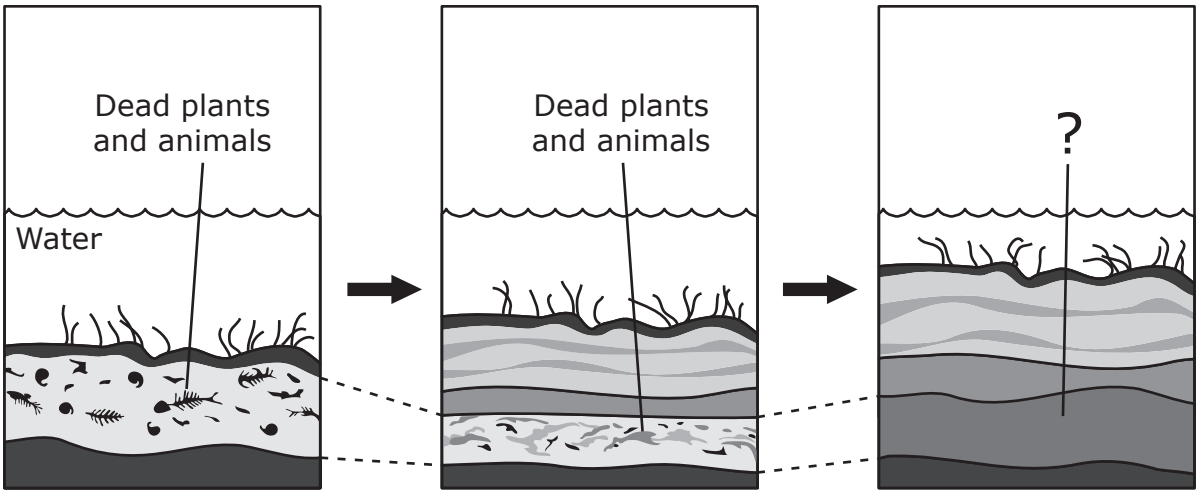


D

2 The diagram shows layers deposited under a body of water. This layering continued for millions of years.



What most likely happened to the dead plants and animals?

F They were eaten by scavengers.

G They became fossil fuels.

H They were washed away by water.

J They became an underground aquifer.

3 After a trip to an aquarium, some students compared the tail fin of sharks with the tail fin of bony fish. The students made a chart listing characteristics of each type of tail fin.

Shark Tail Fin	Bony Fish Tail Fin
• Fin with two lobes of different sizes • Stiff fin • No bone in fin • No muscle control of fin • Can swim only forward	• Fin with two lobes of the same size • Flexible fin • Thin, bony spines in fin • Control of fin by muscles • Can swim forward and backward
 © Mikhail Kokhanchikov/Dreamstime.com	 © Michael Gray/Dreamstime.com

Based on this information, what is most likely an advantage of the bony fish tail fin over the shark tail fin?

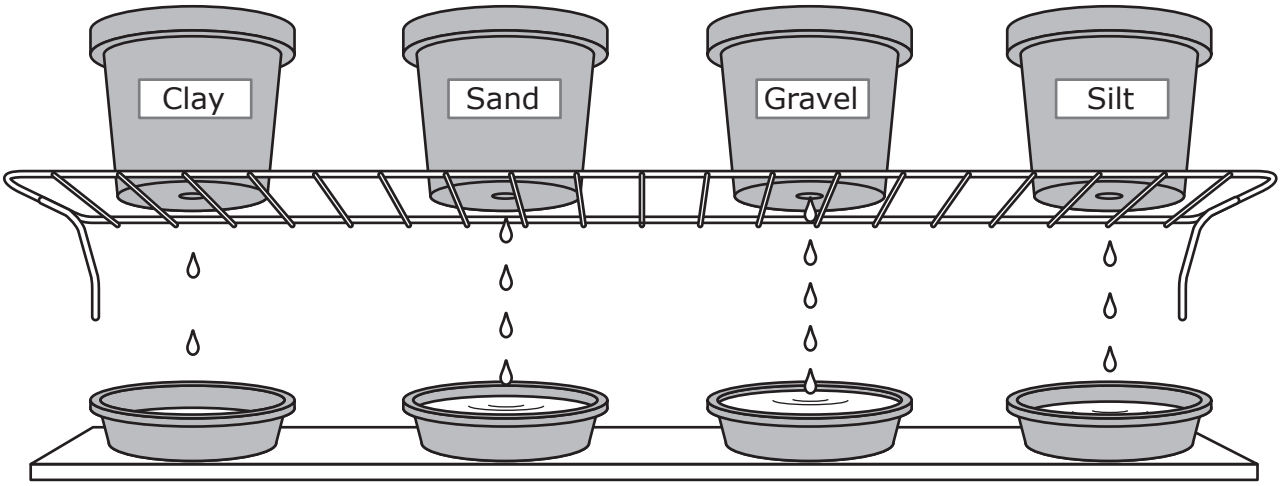
A It is easier for a bony fish to change direction quickly since muscles control the movement of the tail fin.

B The bones in the tail fin help a bony fish sink to lower depths in the water when searching for food.

C The flexible tail fin is fanned by the water, so a bony fish uses less energy to swim.

D The thin spines of the tail fin prevent a bony fish from being seen by larger predator fish.

4 A student places 250 g samples of clay, sand, gravel, and silt in separate flower pots. The pots are set on a wire rack, and dishes are placed beneath the pots so that water can drip through holes and collect. The student then pours 100 mL of water over the sample in each pot. The student measures the time it takes for water to begin dripping from the bottom of each pot.



What property of soils is the student most likely examining with this procedure?

F The differences in texture between wet and dry soils

G How well different soils retain water

H How much water is needed to dissolve different soils

J The amount of time it takes different soils to dry

5 The table lists some physical properties of two objects.

Object 1	Object 2
Solid	Solid
Insulates thermal energy	Conducts thermal energy
Less dense than water	More dense than water
Poor electrical conductor	Good electrical conductor

Based on their properties, which of the objects is most likely a metal?

A Object 1, because it is a solid that is less dense than water

B Object 2, because all metals float in water

C Object 2, because metals conduct thermal energy and electricity

D Object 1, because it can be used to provide insulation for thermal energy

---

6 Which of these describes one or more living organisms that depend on another living organism to survive?

F Bacteria living in the mouth of a horse

G Ivy plants growing up a fence to obtain more sunlight

H Mold living on a hard, rocky surface

J An angelfish releasing carbon dioxide into pond water

7 The picture shows an athlete hitting a ball with a tennis racquet.

What is the athlete demonstrating in the picture?

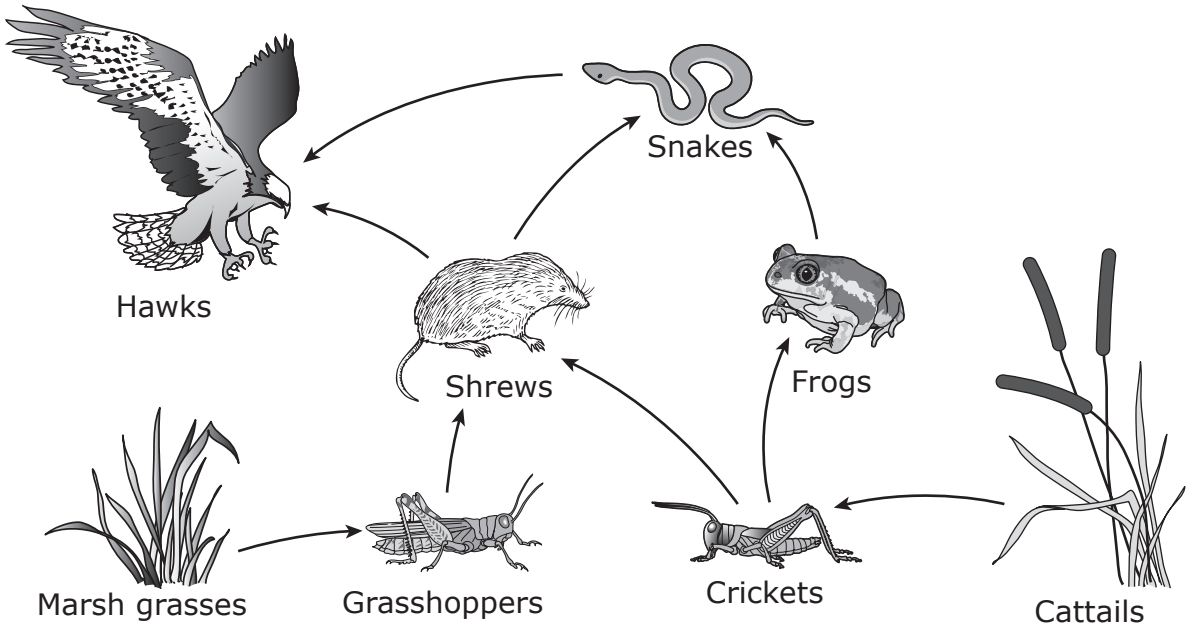
A Doing work by pushing the ball and changing its motion and position

B Changing the position but not the motion of the ball

C Doing work by pulling the racquet and changing the ball's position but not its motion

D Changing the position and motion of the ball without doing any work

8 A partial wetland food web is shown.



Which statement correctly describes the transfer of energy in a food chain in this wetland?

F Energy is transferred from hawks to shrews to grasshoppers to marsh grasses.

G Energy is transferred from marsh grasses to crickets to hawks to frogs.

H Energy is transferred from grasshoppers to crickets to frogs to hawks.

J Energy is transferred from cattails to crickets to shrews to hawks.

---

9 A group of students is performing an investigation to measure how much liquid water is produced from a 10 L sample of snow. What must occur in order for the students to perform this investigation?

A The sample must be kept in a freezer.

B The temperature of the sample must change.

C The investigation must be performed outside.

D The physical state of the sample must remain the same.

10 A bright-red male cardinal comes to a school bird feeder every morning. Like other cardinals, this bird makes a sharp chirping sound as it hops around the bird feeder.

Which of these is a learned behavior of this bird?

F Having red feathers

G Eating seeds during the day

H Coming to the bird feeder each morning

J Making a chirping sound

---

11 One type of fuel was used for thousands of years before other fuels were commonly used. Which fuel is an alternative resource that was most likely the first fuel used by humans?

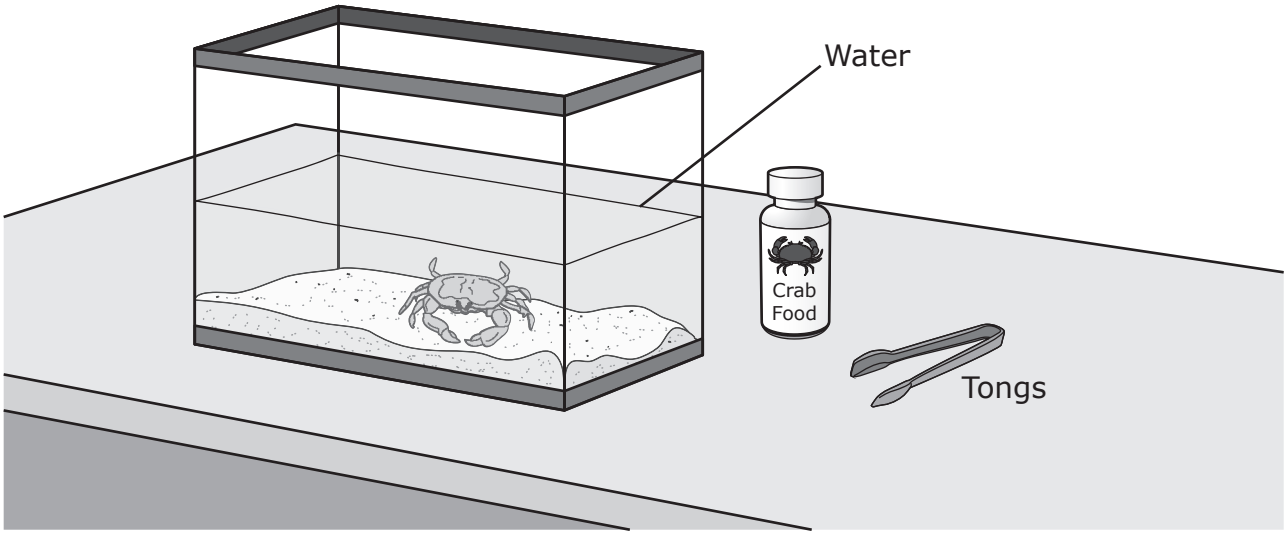
A Coal

B Natural gas

C Petroleum

D Wood

12 Some students are feeding a crab in an aquarium. They use tongs to place the food directly in front of the crab.



The students look through the side of the aquarium. They notice that the image of the tongs appears to break as the tongs enter the water.

Which property of light are the students observing in this situation?

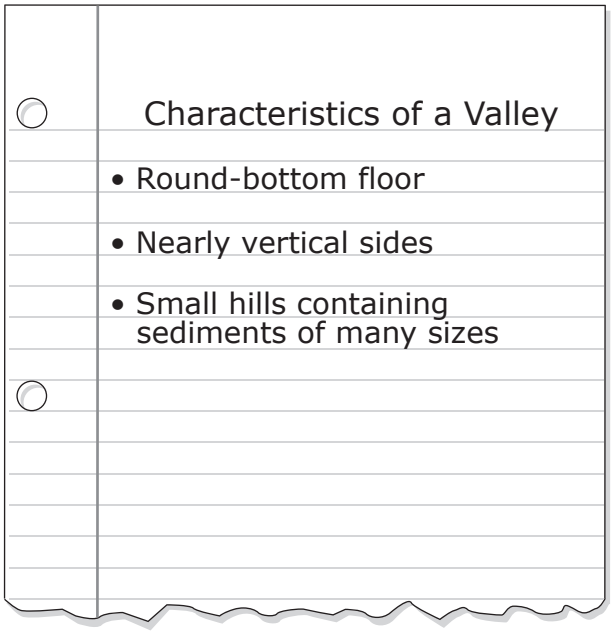
F Light can be refracted and separated into different colors as it moves from air to a different medium.

G Light is refracted as it moves from one medium to another medium.

H Light travels in a straight line and can be reflected off the surface of water.

J Light is absorbed by water and reflected off glass.

13 Students on a field trip observed a valley and wondered how it was formed. The three major characteristics of the valley were recorded.



This valley was most likely formed by —

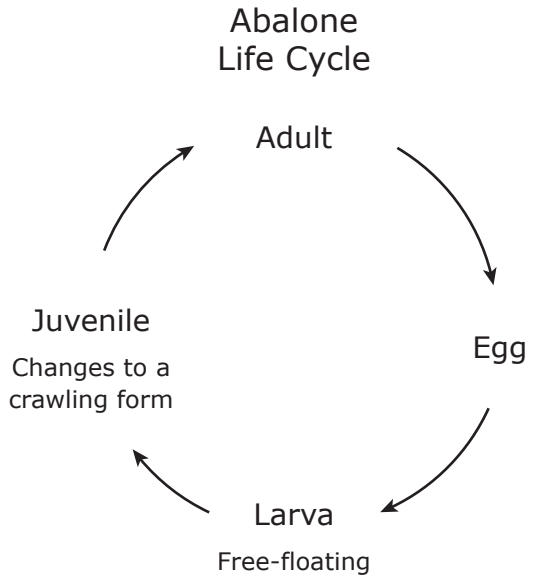
A a rapid series of earthquakes

B volcanic activity

C a flood with rapidly moving water

D the movement of a glacier

14 The abalone is a type of sea snail. Adult abalones slowly crawl over rocks near the shore, while larvae float in the water.



Which organisms have a life cycle that is most like that of abalones?

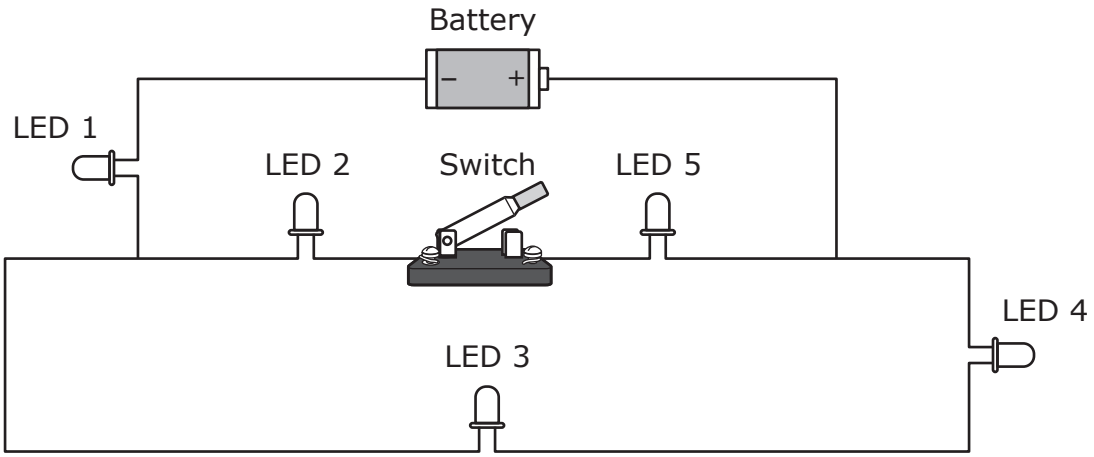
F Humans

G Frogs

H Birds

J Snakes

15 This circuit has five light-emitting diode, or LED, lights. It also has one battery and one switch.



Which LEDs produce light when the switch is in the position shown?

A LEDs 1, 3, and 4 only

B LEDs 1, 2, 3, and 4

C LEDs 3 and 4 only

D LEDs 1, 3, 4, and 5

16 Students are investigating properties of objects. They observe four objects and record observations for each object in the table.

Properties of Four Objects

Object Label	Is a Liquid?	Is Attracted to a Magnet?	Is Soluble in Water?
K	Yes	No	No
L	No	Yes	No
M	No	No	Yes
N	No	No	No

Based on the students' observations, which of these tables properly identifies the objects?

F

Label	Object
K	Oil
L	Iron needle
M	Pancake syrup
N	Rubber ball

H

Label	Object
K	Pancake syrup
L	Safety pin
M	Cotton candy
N	Iron needle

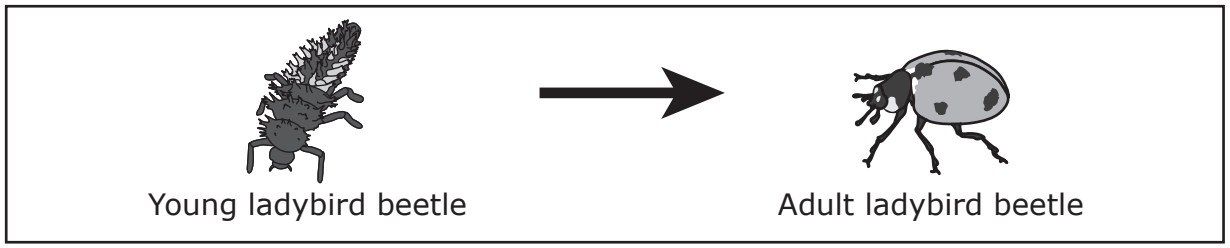
G

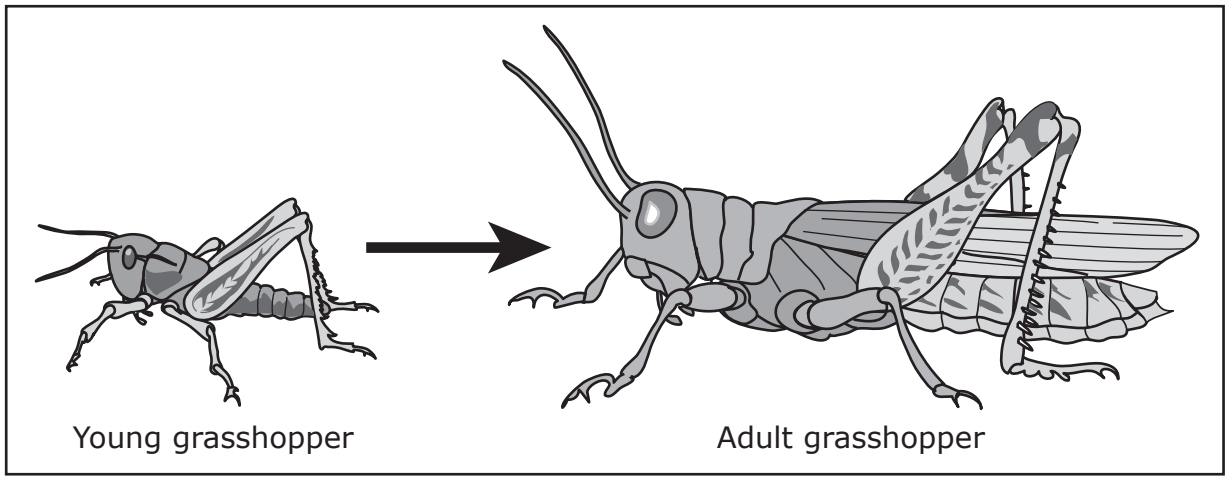
Label	Object
K	Pancake syrup
L	Sugar cube
M	Plastic dish
N	Cotton candy

J

Label	Object
K	Oil
L	Safety pin
M	Sugar cube
N	Rubber ball

17 This diagram shows two stages in the life cycles of ladybird beetles and grasshoppers.





Based on the diagram, which statement best compares the life cycles of these two types of organisms?

A Young ladybird beetles take many years to develop into adults.
Young grasshoppers develop into adults quickly.

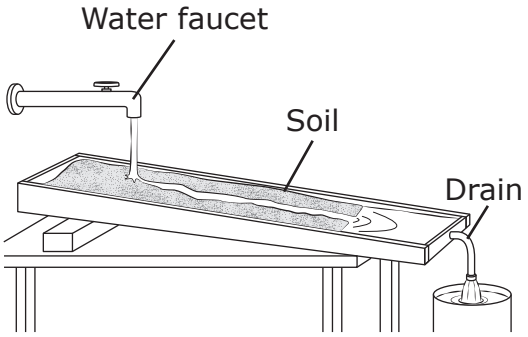
B Young grasshoppers live in a habitat that is different from that of adults.
Young ladybird beetles live in the same habitat as adults.

C Young grasshoppers undergo incomplete metamorphosis to become adults.
Young ladybird beetles undergo complete metamorphosis to become adults.

D Young ladybird beetles have a nymph stage before becoming adults.
Young grasshoppers are larvae before becoming adults.

18 The Grand Canyon is more than 400 km long and in some places almost 2 km deep. Which model best represents the main process that formed the Grand Canyon?

F



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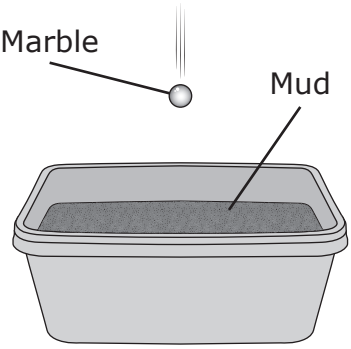

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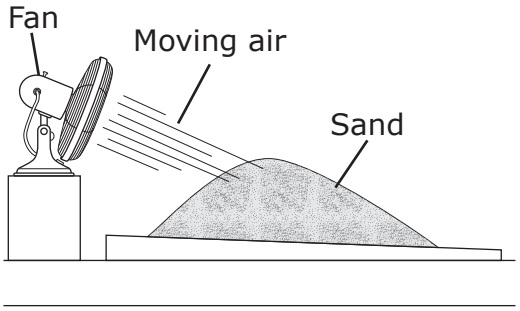

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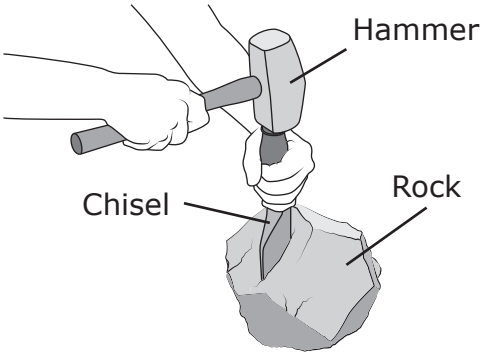
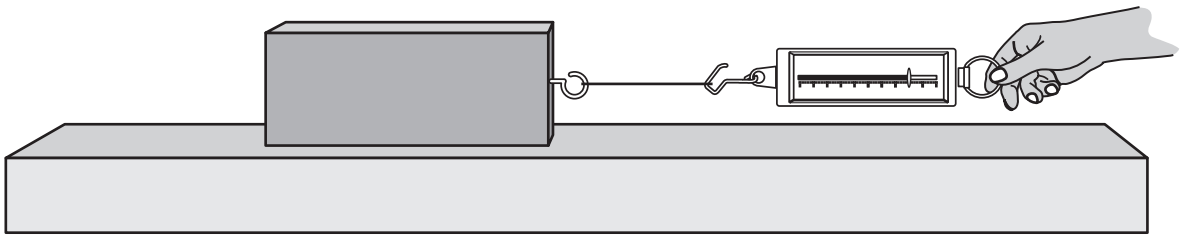


GO ON

19 Students design an experiment to determine how much force is needed to move blocks of wood of different masses slowly across a lab table.



Which procedure should students include in their design?

A Conduct five trials, using a different scale to pull each block of wood

B Conduct five trials, pulling a different side of each block each time

C Conduct five trials, using a different table for each trial

D Conduct five trials, pulling each block of wood in the same way for each trial

20 The leaves of two types of plants that live in different environments are shown in the pictures.

Giant water lily leaves

Mesquite leaves

The leaves of both plants have different structures. What differences in the structure of the leaves of these plants likely help them survive in their environments?

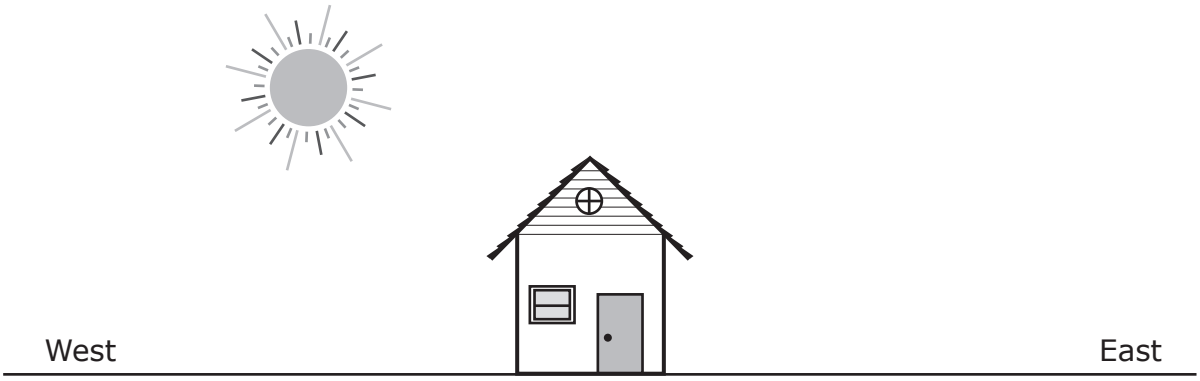
F The pan-like shape of the giant water lily leaves helps them catch rainwater.
The slim shape of the mesquite leaves helps them avoid sunlight.

G The broad shape of the giant water lily leaves helps them stay on the water surface.
The slim shape of the mesquite leaves helps them prevent water loss.

H The pan-like shape of the giant water lily leaves helps them attract small fish.
The slim shape of the mesquite leaves helps them avoid herbivores.

J The broad shape of the giant water lily leaves helps them attract aquatic birds.
The slim shape of the mesquite leaves helps them attract pollinators.

21 A teacher asks students to explain what they see in this picture. Four student explanations are shown in the box.



Student 1: The sun will set in less than 6 hours.
Student 2: The sun will reach the east horizon in less than 10 hours.
Student 3: The picture shows early morning.
Student 4: The picture shows the location of the sun at noon.

Which of the students gave a correct explanation?

A Student 1 only

B Students 2 and 4 only

C Student 2 only

D Students 1 and 3 only

22 A family takes a group picture in a park where bluebonnets are blooming. The family notices that some of the blooms are white and others are blue.

The color of the blooms is most likely determined by —

F air temperature

G the age of the plant

H the types of consumers that eat the plant

J inheritance from parent plants

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23 A beaker with 115 mL of solution has a temperature of 21°C. The solution contains 5 g of salt and 115 mL of water. Students added two ice cubes to the solution and stirred the solution with a stirring rod.

Which properties of the solution changed as the ice cubes melted?

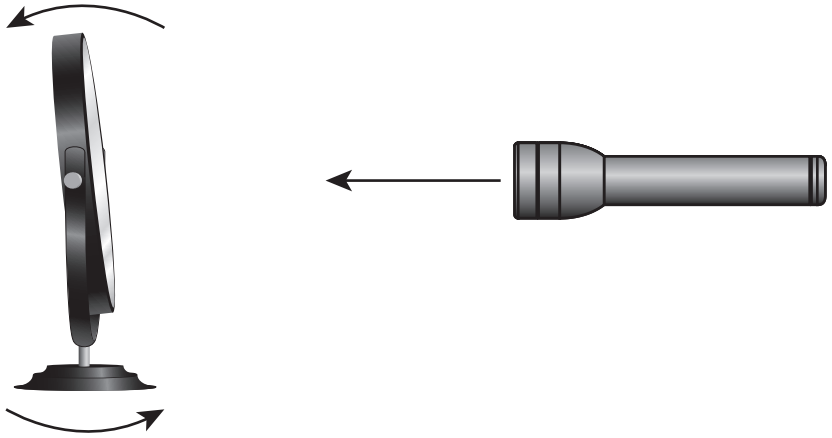
A The color and physical state of the solution

B The temperature, mass, and volume of the solution

C The volume, temperature, and mass of the salt in the solution

D The physical state and temperature of the solution

24 A student conducts an investigation by shining a flashlight toward a flat mirror. The student changes the angle of the mirror and observes the path of the reflected light.



Flat mirror

As the mirror changes direction, the light reaching the mirror can reach the ceiling because the light —

F travels in straight lines and reflects from the surface of the mirror

G refracts in the glass of the mirror and is spread out all over the room

H enters the mirror and changes direction when it is refracted by the back of the mirror

J travels through air and does not change its direction in air

---

25 A science class has an aquarium in which fish and aquatic plants are growing. How is carbon dioxide directly involved in the survival of organisms in the aquarium?

A The fish must absorb carbon dioxide through their gills for energy.

B Both the plants and the fish need carbon dioxide to make their own nutrients.

C The plants need carbon dioxide to make sugar.

D The plants release carbon dioxide into the water to control the water temperature.

26 A family was vacationing in the mountains in a cabin that had no electrical power. They needed boiling water in order to prepare dried soup mix.

With no electrical energy available, which method would most likely provide enough thermal energy to quickly heat the water to boiling?

F Using a microwave oven to heat water in a glass jar for 3 minutes

G Shaking the water in a closed, insulated plastic bottle for 3 minutes

H Shining a battery-powered flashlight on a metal container of water for 10 minutes

J Placing a metal pot of water over glowing charcoal in an outdoor grill for 10 minutes

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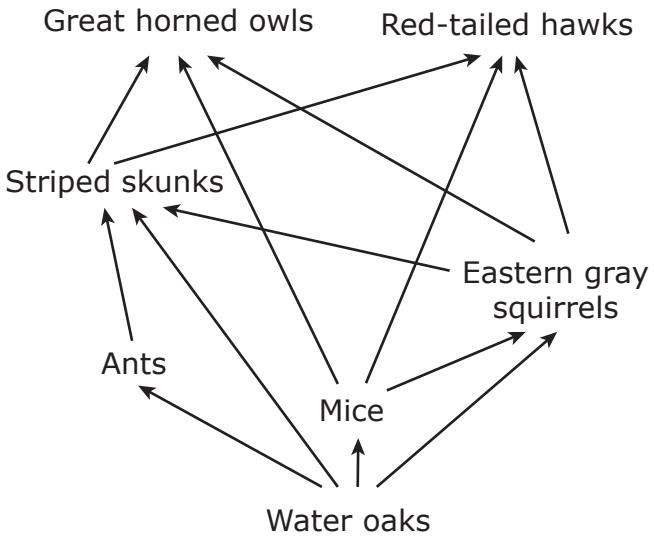
27 A partial food web from the Texas Piney Woods is shown.



How many types of organisms in this food web obtain energy directly from producers?

A Two

B Three

C Four

D Five

28 The picture below shows a cumulonimbus cloud forming over an ocean.

© NASA

Which statement best explains how the sun and the ocean interact to form a cumulonimbus cloud?

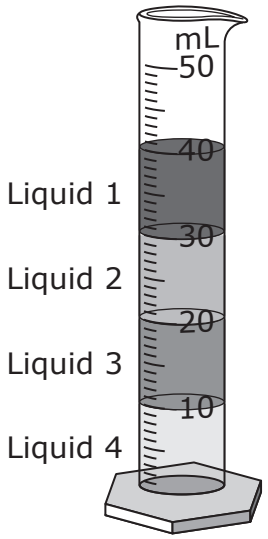
F Heat from the sun warms the ocean, causing water to evaporate. The water vapor then condenses to form a cumulonimbus cloud.

G Heat from the sun causes clouds in the area to gather over the ocean and form one large cumulonimbus cloud.

H Light from the sun shines on the ocean, causing water vapor to condense. The water then evaporates to form a cumulonimbus cloud.

J Light from the sun causes ocean water to reflect water vapor into the air and gather over the ocean into a cumulonimbus cloud.

29 A student measured out 10 mL of four clear liquids and added one drop of a different-colored dye to each liquid. One of the liquids was water. The student then carefully poured each liquid into a graduated cylinder and let the mixture settle for 30 minutes. The student observed that the liquids had separated into layers, as shown in the diagram.



Which of these procedures would help the student identify the layer of water?

A Stir the liquids, let them settle, and then identify the bottom layer as water

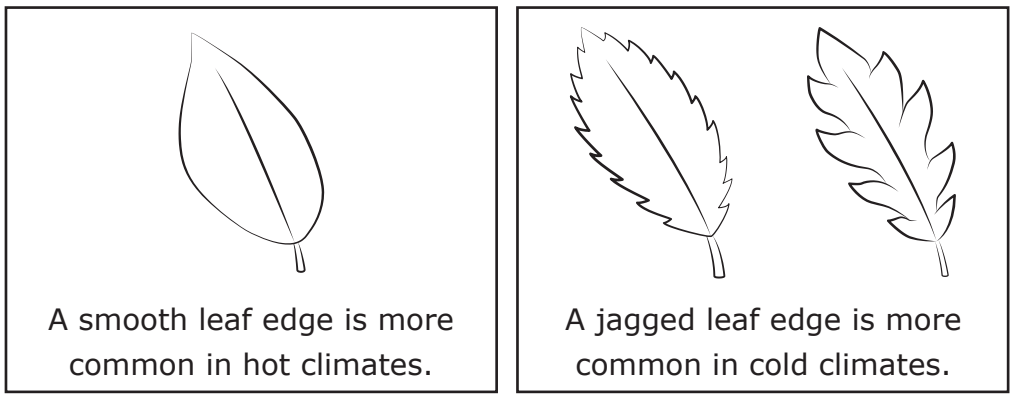
B Drop a piece of ice into the graduated cylinder, let the ice settle, and then identify the layer just above the ice as water

C Add water to the graduated cylinder, let the mixture settle, and then identify the layer that increases in volume as water

D Carefully pour each layer into separate plastic containers, place the containers in a freezer, and then identify the liquid that takes the longest to freeze as water

30 Woody plants have many different kinds of leaves. Some leaves have very smooth edges, while other leaves have jagged edges, as shown in the diagram. The characteristics of plant leaves vary with the climate in which the plant naturally grows. Some scientists discovered an area with many fossilized leaves of woody plants. The scientists used data from samples of 100 leaf fossils to compare the number with smooth-edged leaves and the number with jagged-edged leaves.

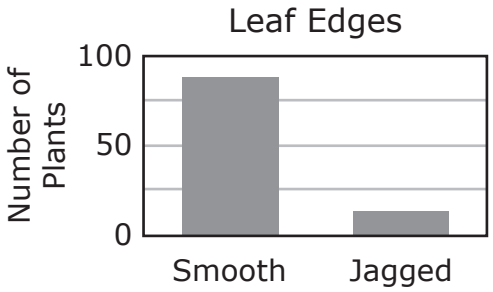
Leaf Characteristics



The scientists concluded that the plants had grown in a hot climate.

Which graph most likely represents the data from the investigation?

F



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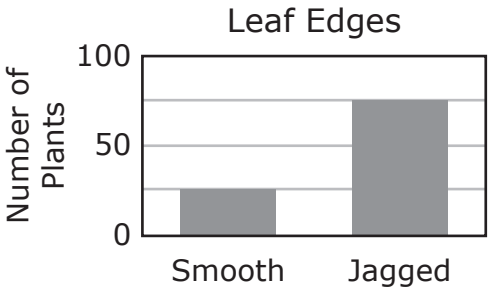

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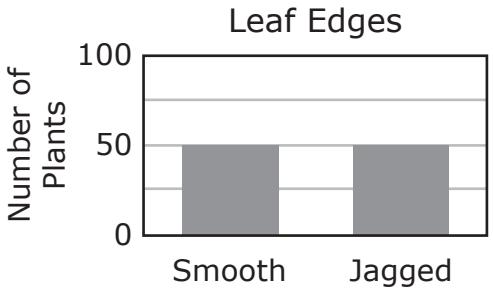

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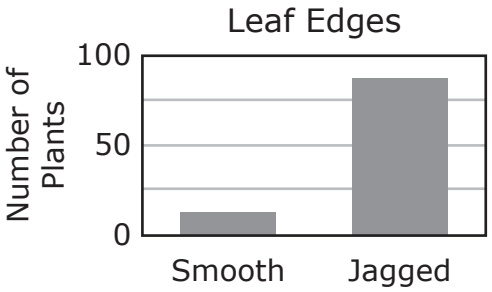
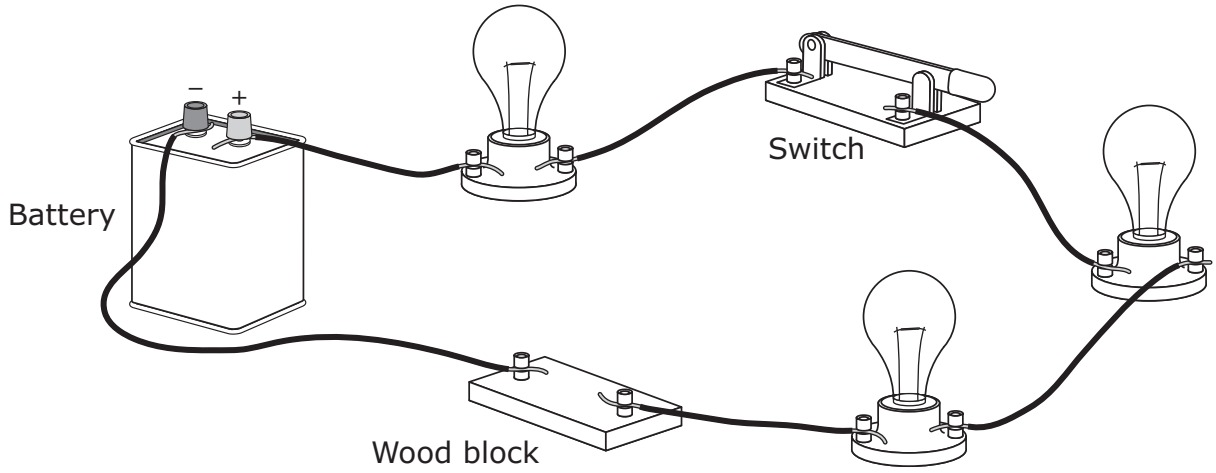


GO ON

31 The circuit below does not work.



Which procedure would most likely allow the bulbs to light?

A Open the switch and then connect the two wires that are attached to the wood block

B Switch the positions of the two wires that are connected to the battery and then open the switch

C Move the switch closer in the circuit to the battery

D Connect the two wires that are attached to the wood block

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32 Aquatic plants have adaptations that help them live in water. For example, the structures needed for making food are located on the tops of floating plant leaves.

This adaptation helps the plants —

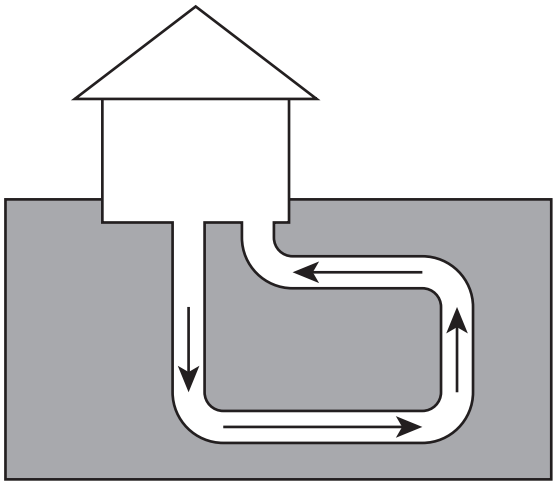
F absorb sunlight

G stay anchored

H avoid predators

J capture fish

33 This simple diagram shows a system used to heat a house. Water is pumped from the house through a series of pipes underground, where the water is warmed. The warmed water returns to the house to supply heat on cold winter days.



Which type of alternative energy resource is used to supply heat to the house?

A Biofuel

B Hydroelectric

C Geothermal

D Solar

34 The table lists the characteristics of four types of animals.

Type of Animal	Characteristics
Muskrat	Small mammal; body that is about 32 cm long; long, scaly tail; back feet that are partially webbed
Mallard	Migratory bird; flat, webbed feet; males and females have different colored feathers
Mink	Small mammal; about 61 cm long; thick fur; eats small mammals, birds, and fish
Western grebe	Migratory bird; black and white feathers; hunts by diving and spearing fish

What features do the ecosystems in which these animals live most likely have in common?

F Dry, rocky mountains

G Forests of pine trees

H Tall, spiny cacti

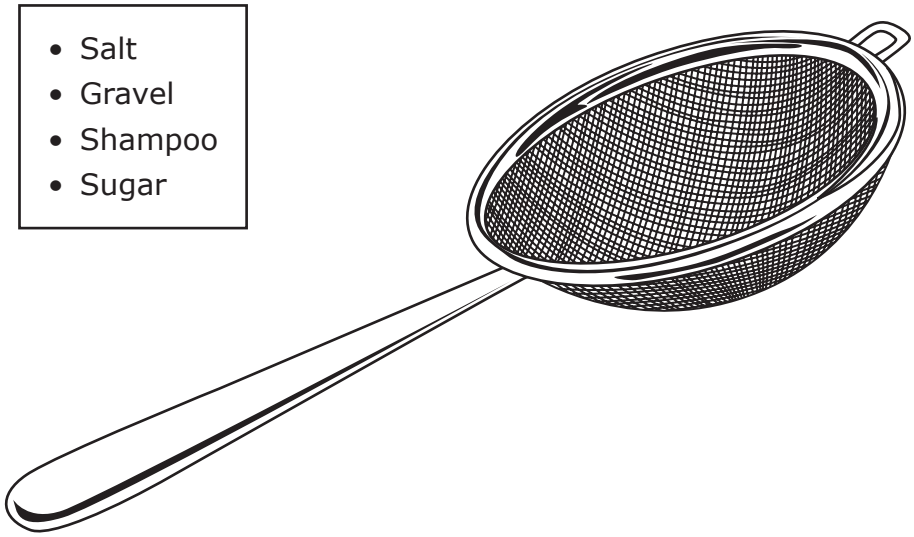
J Lakes and rivers

35 A student stirs 15 grams of each substance listed below into 200 milliliters of water to form four different mixtures. The student then tries to separate the water from each mixture by pouring the mixture through a kitchen tea strainer.

Substances

- Salt
- Gravel
- Shampoo
- Sugar

Kitchen Tea Strainer



Which mixture can the student separate most easily with the strainer?

A Salt and water

B Gravel and water

C Shampoo and water

D Sugar and water

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36 Which statement best describes the processes of weathering and erosion?

F Weathering and erosion are directly responsible for the breakdown of any type of rock into smaller particles and the carrying away of the loose sediments.

G Weathering and erosion are directly responsible for depositing loose sediments on the bottom of the ocean, forming layers of sediment.

H Weathering and erosion are directly responsible for the amount of water in a river that transports sediments to the sea.

J Weathering and erosion are directly responsible for the transportation, deposition, and compaction of loose sediments on the seafloor.

BE SURE YOU HAVE RECORDED ALL OF YOUR ANSWERS ON THE ANSWER DOCUMENT.

STOP

Item Number	Reporting Category	Readiness or Supporting	Content Student Expectation	Process Student Expectation	Correct Answer
1	2	Readiness	5.6(A)		D
2	3	Readiness	5.7(A)	5.2(D)	G
3	4	Readiness	5.10(A)	5.2(C)	A
4	3	Supporting	4.7(A)	5.2(D)	G
5	1	Readiness	5.5(A)	5.2(D)	C
6	4	Readiness	5.9(A)		F
7	2	Supporting	3.6(B)	5.2(D)	A
8	4	Readiness	5.9(B)	5.3(C)	J
9	1	Supporting	3.5(C)	5.2(A)	B
10	4	Readiness	5.10(B)		H
11	3	Readiness	5.7(C)		D
12	2	Readiness	5.6(C)	5.2(D)	G
13	3	Readiness	5.7(B)		D
14	4	Supporting	3.10(C)		G
15	2	Readiness	5.6(B)	5.2(D)	A
16	1	Readiness	5.5(A)	5.2(G)	J
17	4	Supporting	5.10(C)	5.2(D)	C
18	3	Readiness	5.7(B)	5.3(C)	F
19	2	Supporting	5.6(D)	5.2(A)	D
20	4	Readiness	5.10(A)	5.2(C)	G
21	3	Readiness	5.8(C)		A
22	4	Readiness	5.10(B)	5.2(D)	J
23	1	Supporting	5.5(D)	5.4(A)	B
24	2	Readiness	5.6(C)	5.2(D)	F
25	4	Supporting	5.9(D)	5.4(A)	C
26	2	Readiness	5.6(A)		J
27	4	Readiness	5.9(B)	5.3(C)	C
28	3	Supporting	5.8(B)		F
29	1	Readiness	5.5(A)	5.4(A)	C
30	3	Supporting	5.7(D)	5.2(G)	F
31	2	Readiness	5.6(B)	5.2(D)	D
32	4	Readiness	5.9(A)		F
33	3	Readiness	5.7(C)		C
34	4	Supporting	3.9(A)	5.2(D)	J
35	1	Supporting	5.5(C)	5.2(D)	B
36	3	Readiness	5.7(A)		F

2018 STAAR Grade 5 Science Rationales

Item #	Rationales	
1	Option D is correct	A French horn produces only sound energy.
	Option A is incorrect	Fireworks produce both sound energy and light energy.
	Option B is incorrect	A television produces both sound energy and light energy.
	Option C is incorrect	A digital alarm clock produces both sound energy and light energy.
2	Option G is correct	The sediments on top of the dead plants and animals contribute to the compression of the dead plants and animals to form coal, a fossil fuel.
	Option F is incorrect	The dead plants and animals are buried under sediments, so they are not available for scavengers.
	Option H is incorrect	The dead plants and animals were not washed away by water but were buried under layers of sediment.
	Option J is incorrect	An aquifer is underground, porous, and made of permeable rock that contains and transfers water.
3	Option A is correct	Information in the chart shows that the bony fish has more control over how it can swim.
	Option B is incorrect	There is no information in the chart that describes the depth to which a fish can sink because of bones in its tail.
	Option C is incorrect	There is no information in the chart that describes how much energy is used by either fish when swimming.
	Option D is incorrect	There is no information in the chart that describes whether the tail fin aids in camouflage.
4	Option G is correct	The diagrams show different amounts of water dripping from pots with different types of sediment.
	Option F is incorrect	All of the pots have water added to the sediments, so there is no comparison between wet and dry soils.
	Option H is incorrect	The same amount of water (100 mL) was added to each pot.
	Option J is incorrect	The time that is measured is how long it takes the water to begin dripping from the pot, not how long it takes the soil to dry.
5	Option C is correct	Metals are conductors of both thermal energy and electricity.
	Option A is incorrect	Not all metals are solids, and many nonmetals are less dense than water.
	Option B is incorrect	Few metals float on water.
	Option D is incorrect	Metals conduct, not insulate, thermal energy.
6	Option F is correct	Bacteria and a horse are both living organisms.
	Option G is incorrect	Ivy plants are living organisms, but the fence is nonliving.
	Option H is incorrect	A hard, rocky surface is nonliving.
	Option J is incorrect	Carbon dioxide is nonliving.
7	Option A is correct	Both the motion and the position of the ball are being changed.
	Option B is incorrect	The motion of the ball is changed.
	Option C is incorrect	The racquet is not being pulled.
	Option D is incorrect	Work is being done.
8	Option J is correct	Energy is transferred in the direction of the arrows, from producers to consumers.
	Option F is incorrect	The order of the energy transfer is reversed.
	Option G is incorrect	Energy is not transferred from hawks to frogs.
	Option H is incorrect	Energy is not transferred from grasshoppers to crickets.
9	Option B is correct	In order to measure the liquid water produced from 10L of snow, the snow must first melt.
	Option A is incorrect	If the snow is kept in the freezer, the state of matter will not change.
	Option C is incorrect	Melting the snow depends on temperature, not location.
	Option D is incorrect	The snow must melt in order to measure the amount of liquid water it contained.

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2018 STAAR Grade 5 Science Rationales

Item #	Rationales	
10	Option H is correct	The location of a specific bird feeder is learned.
	Option F is incorrect	A cardinal does not learn to have red feathers.
	Option G is incorrect	A cardinal does not learn to eat seeds only during the day.
	Option J is incorrect	Making sounds is an innate behavior.
11	Option D is correct	Wood is an alternative resource that was likely used by early humans.
	Option A is incorrect	Coal is a fossil fuel, not an alternative resource.
	Option B is incorrect	Natural gas is a fossil fuel, not an alternative resource.
	Option C is incorrect	Petroleum is a fossil fuel, not an alternative resource.
12	Option G is correct	The refraction of light is what causes the tongs to appear broken.
	Option F is incorrect	Light can be refracted and separated into different colors; however, this does not describe the change in the appearance of the tongs.
	Option H is incorrect	Light travels in a straight line and can be reflected off of the surface of the water; however, this does not describe the change in the appearance of the tongs.
	Option J is incorrect	Light can be absorbed and reflected; however, this does not explain the change in the appearance of the tongs.
13	Option D is correct	The characteristics listed describe a valley formed by the movement of a glacier.
	Option A is incorrect	Valleys formed by earthquakes would not have the same characteristics as valleys formed by the movement of glaciers.
	Option B is incorrect	Volcanic activity builds up Earth's crust, and this valley was created by erosion.
	Option C is incorrect	A river would create a V-shaped valley, not valleys with round floors.
14	Option G is correct	The stages of the life cycle of the frog most closely match the stages of the life cycle of the abalone.
	Option F is incorrect	Humans do not have a larval stage.
	Option H is incorrect	Birds do not have a larval14 stage.
	Option J is incorrect	Snakes do not have a larval stage.
15	Option A is correct	LEDs 1, 3, and 4 are not affected by the position of the switch.
	Option B is incorrect	The switch position affects LED 2.
	Option C is incorrect	LED 1 will also produce light with the switch open.
	Option D is incorrect	The switch position affects LED 5.
16	Option J is correct	The oil, safety pin, sugar cube, and rubber ball match the descriptions in the table.
	Option F is incorrect	Pancake syrup is a liquid.
	Option G is incorrect	A sugar cube is soluble in water.
	Option H is incorrect	An iron needle is attracted to a magnet.
17	Option C is correct	Based on the diagram, a grasshopper undergoes incomplete metamorphosis, and a ladybird beetle undergoes a complete metamorphosis.
	Option A is incorrect	Based on the diagram, there is no way to determine the length of time for either the ladybird beetle or the grasshopper to develop into an adult.
	Option B is incorrect	Based on the diagram, there is no way to determine the habitat of either the grasshopper or the ladybird beetle during any developmental stage.
	Option D is incorrect	Based on the diagram, there is no way to determine the stages of development for either the ladybird beetle or the grasshopper.

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2018 STAAR Grade 5 Science Rationales

Item #	Rationales	
18	Option F is correct	Running water forming a stream through soil best represents the process that formed the Grand Canyon because the Grand Canyon was formed by erosion from running water.
	Option G is incorrect	A fan blowing air over sand represents the formation of a sand dune.
	Option H is incorrect	A marble dropping into a bucket of mud represents an impact from a meteorite.
	Option J is incorrect	A hammer and chisel breaking apart a rock represents weathering of rock.
19	Option D is correct	Using multiple trials while controlling all variables except one produces more reliable results in experiments.
	Option A is incorrect	Different scales could measure differently and would result in more than one uncontrolled variable in the experiment.
	Option B is incorrect	Each side of the block has a different surface area and would result in more than one uncontrolled variable in the experiment.
	Option C is incorrect	Blocks would not slide the same way on different tables and would result in more than one uncontrolled variable in the experiment.
20	Option G is correct	The broad shape of the lily helps the leaf float on the surface, and the slim mesquite leaves help prevent water loss.
	Option F is incorrect	The lily grows in water and so does not need to trap rainwater to survive.
	Option H is incorrect	The lily makes its own food and so does not need to attract fish to survive.
	Option J is incorrect	The lily does not need to attract aquatic birds to survive.
21	Option A is correct	The sun appears to move across the sky from east to west and will be moving below the western horizon in a few hours.
	Option B is incorrect	Student 2 stated that the sun would reach the eastern horizon too quickly, and student 4 stated that the sun was near its noontime position.
	Option C is incorrect	Student 2 explained that the sun would reach the eastern horizon too quickly.
	Option D is incorrect	Student 3 stated that the sun would appear in the west in early morning.
22	Option J is correct	Flower color is an inherited trait.
	Option F is incorrect	Flower color is not determined by the air temperature.
	Option G is incorrect	Flower color is not determined by the age of the plant.
	Option H is incorrect	Flower color is not determined by the types of animals that eat them.
23	Option B is correct	The melting ice will increase the mass and volume of the solution and decrease the temperature.
	Option A is incorrect	A salt-water solution is colorless, and once the ice melts, the color and state of the solution will be unchanged.
	Option C is incorrect	The melting ice cubes do not change the mass of the salt in the solution.
	Option D is incorrect	Once the ice melts, the state of the solution is not changed.
24	Option F is correct	The light travels in straight lines, and when it reaches the mirror, the light will be reflected.
	Option G is incorrect	The light reaching the mirror will not move toward the ceiling because of refraction.
	Option H is incorrect	Light that enters the mirror is reflected, not refracted by the back of the mirror.
	Option J is incorrect	Once light reaches the mirror, it is reflected.
25	Option C is correct	Plants use carbon dioxide to make sugar, which is used by animals for food.
	Option A is incorrect	Fish do not use carbon dioxide for energy.
	Option B is incorrect	Fish cannot make their own food.
	Option D is incorrect	Plants release oxygen, not carbon dioxide.

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2018 STAAR Grade 5 Science Rationales

Item #	Rationales	
26	Option J is correct	Placing a metal pot of water over glowing charcoal in an outdoor grill would produce enough thermal energy to heat the water.
	Option F is incorrect	Electricity is required for the microwave oven to work.
	Option G is incorrect	Shaking a bottle would not produce enough thermal energy to boil water.
	Option H is incorrect	A flashlight would not produce enough thermal energy to boil water.
27	Option C is correct	The water oaks are producers, and the web shows arrows pointing from the water oaks to mice, ants, squirrels, and skunks.
	Option A is incorrect	The web shows arrows pointing from the water oaks to four organisms, not two.
	Option B is incorrect	The web shows arrows pointing from the water oaks to four organisms, not three.
	Option D is incorrect	The web shows arrows pointing from the water oaks to four organisms, not five.
28	Option F is correct	The sun warms the ocean water, which causes evaporation, and the water vapor condenses to form a cloud.
	Option G is incorrect	The sun's heat does not cause clouds to gather.
	Option H is incorrect	The sun's light does not cause water to condense.
	Option J is incorrect	Water is not reflected; however, light is reflected.
29	Option C is correct	Adding water will increase the volume of one of the liquids, identifying it as water.
	Option A is incorrect	The layer with the greatest density will be on the bottom, and water may not be the layer with the greatest density.
	Option B is incorrect	Ice is less dense than water and will float on top of the water layer.
	Option D is incorrect	Some liquids have a lower freezing point than water and may take longer to freeze.
30	Option F is correct	The graph shows that most of the leaves had smooth edges, which indicates that the plants grew in a hot climate.
	Option G is incorrect	The graph shows equal numbers of smooth and jagged leaf edges, which doesn't indicate a hot or cold climate.
	Option H is incorrect	The graph shows that most of the leaves had jagged edges, indicating that they grew in a cold climate.
	Option J is incorrect	The graph shows that almost all the leaves had jagged edges, indicating that they grew in a cold climate.
31	Option D is correct	The circuit will be complete when the two wires are connected.
	Option A is incorrect	The circuit is not complete when the switch is open.
	Option B is incorrect	The circuit is not complete when the switch is open.
	Option C is incorrect	The circuit is not complete. Electricity will not flow through the wood block.
32	Option F is correct	The floating leaves would allow the plants to absorb sunlight to make food.
	Option G is incorrect	The roots are located at the bottom of the plant and anchor it.
	Option H is incorrect	Structures that help plants make food do not help them avoid predators.
	Option J is incorrect	Plants do not capture fish to make food.
33	Option C is correct	Water is warmed by flowing past hot underground rock or soil layers and then pumped back to the house.
	Option A is incorrect	Biofuels produce energy by burning once-living matter, such as plants.
	Option B is incorrect	Hydroelectric energy is produced by falling water, usually water over a dam.
	Option D is incorrect	Solar energy is produced by the sun's rays striking an object above the ground.
34	Option J is correct	Animals that eat fish or have webbed feet live in areas with lakes and rivers.
	Option F is incorrect	Animals that live in dry mountains do not eat fish or need webbed feet.
	Option G is incorrect	Animals that live in pine forests do not eat fish or need webbed feet.
	Option H is incorrect	Animals that live in deserts do not need thick fur or webbed feet.

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2018 STAAR Grade 5 Science Rationales

Item #	Rationales	
35	Option B is correct	Gravel does not dissolve in water, and its particles are too large to go through the strainer.
	Option A is incorrect	Salt dissolves in water, so the strainer will not separate them.
	Option C is incorrect	Shampoo dissolves in water, so the strainer will not separate them.
	Option D is incorrect	Sugar dissolves in water, so the strainer will not separate them.
36	Option F is correct	Weathering is the breakdown of rocks, and erosion is the process which carries away the sediments.
	Option G is incorrect	Sediments are deposited after being eroded and transported.
	Option H is incorrect	Weathering and erosion do not usually determine the amount of water in the river.
	Option J is incorrect	Weathering and erosion of sediments occur before transport, deposition, and compaction.