

GRADE 5
Science

Administered May 2017

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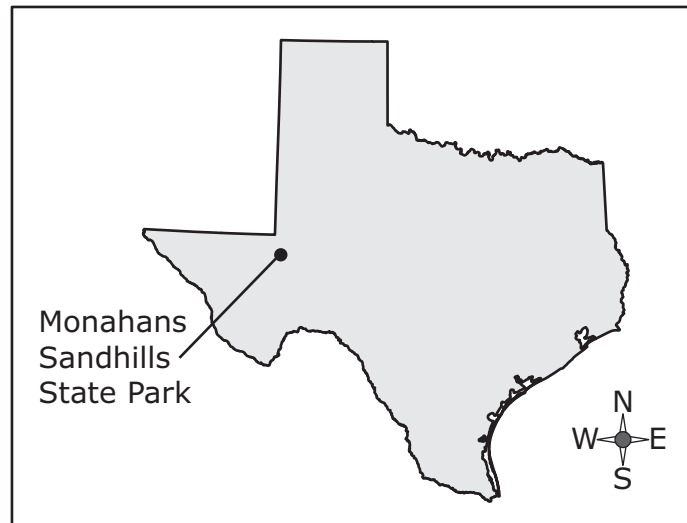
SCIENCE

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 Monahans Sandhills State Park in Texas has almost 4,000 acres of sand dunes. Some of the dunes are as tall as a six-story building.

Location of Monahans Sandhills State Park



The dunes in the park are formed by —

- A rainstorms
- B tornadoes
- C earthquakes
- D strong winds

- 2** Fertilizers used on farms near the coast can be carried to the ocean when runoff occurs during rain showers. These fertilizers can decrease the populations of fish and shellfish.

Which other populations most likely decrease as a result?

- F** Organisms that eat algae
 - G** Organisms that live on farms
 - H** Organisms that eat fish and shellfish
 - J** All of these
-

- 3** A student records the following information about a planet.

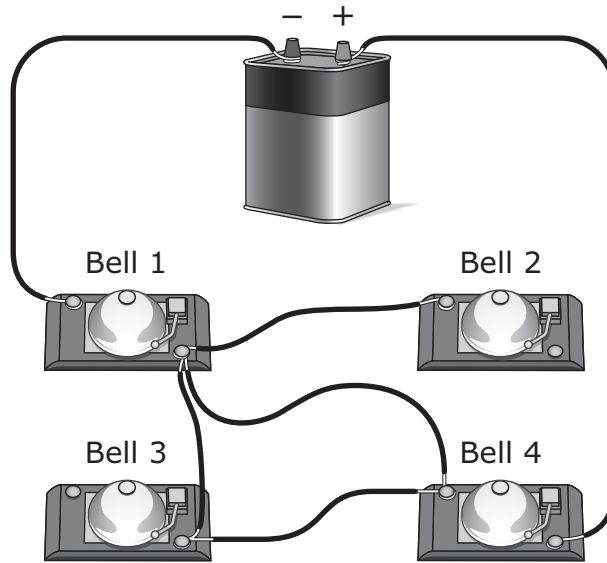
Characteristics of a Planet

- Its largest moon is named Titan.
- It is made up mostly of gases.
- It is surrounded by rings.
- It is the sixth planet from the sun.

Which planet is the student studying?

- A** Saturn
- B** Uranus
- C** Jupiter
- D** Mars

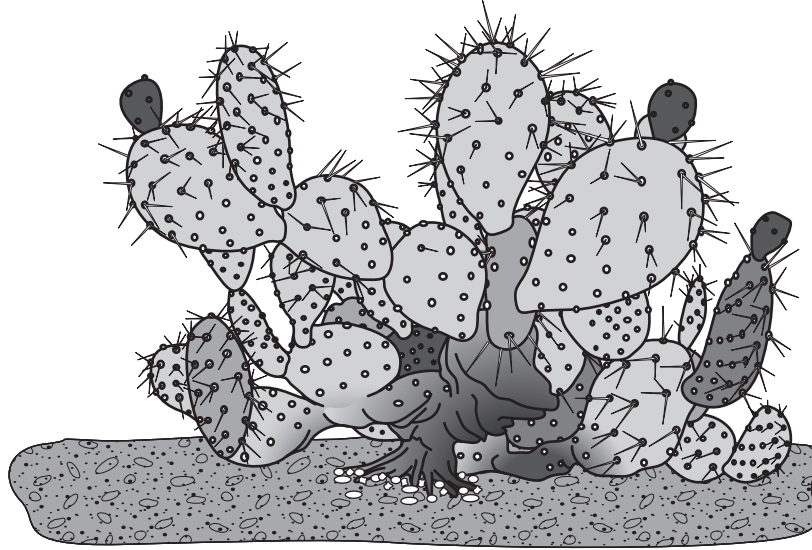
4 The diagram shows an electric circuit with four bells that a student plans to build.



When the student connects the wires as shown, which of the bells will ring?

- F Bell 1 only
- G Bells 1 and 4 only
- H Bells 3 and 4 only
- J Bells 1, 2, 3, and 4

5 Many desert animals depend on the prickly pear cactus.



What role does the prickly pear cactus play in a desert food web?

- A It obtains energy from producers.
- B It returns nutrients to the soil.
- C It preys upon other organisms.
- D It provides energy to consumers.

- 6** In an investigation hot water is poured into a clear plastic cup. Another clear plastic cup is placed upside down over the cup of hot water.

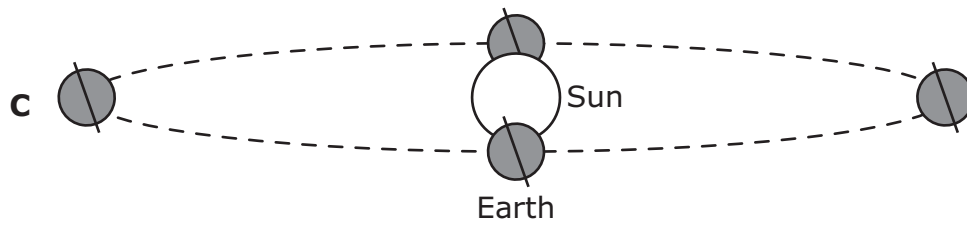
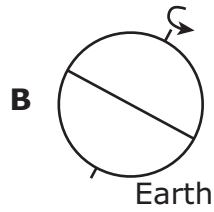
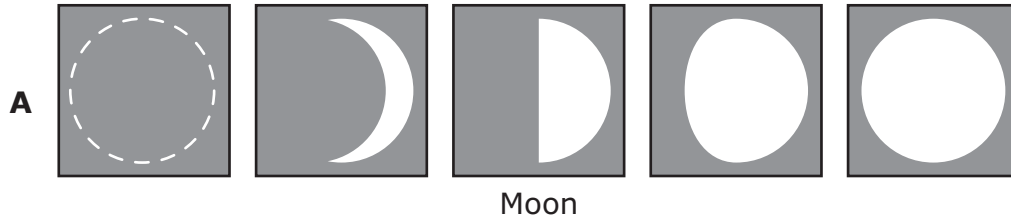
Hot-Water Investigation







Which of these is likely to occur during the next three minutes?

- F** The hot water will become hotter because air and heat are trapped in the top cup.
- G** The water level will rise in the bottom cup because of evaporation.
- H** Water droplets will form on the inside of the top cup as the water vapor cools.
- J** Water from the bottom cup will become solid as the hot water cools.

7 Which of these best explains why the sun appears to move across the sky each day?



8 The table gives information about four types of fish. These fish all have mouth structures that allow them to eat different types of food.

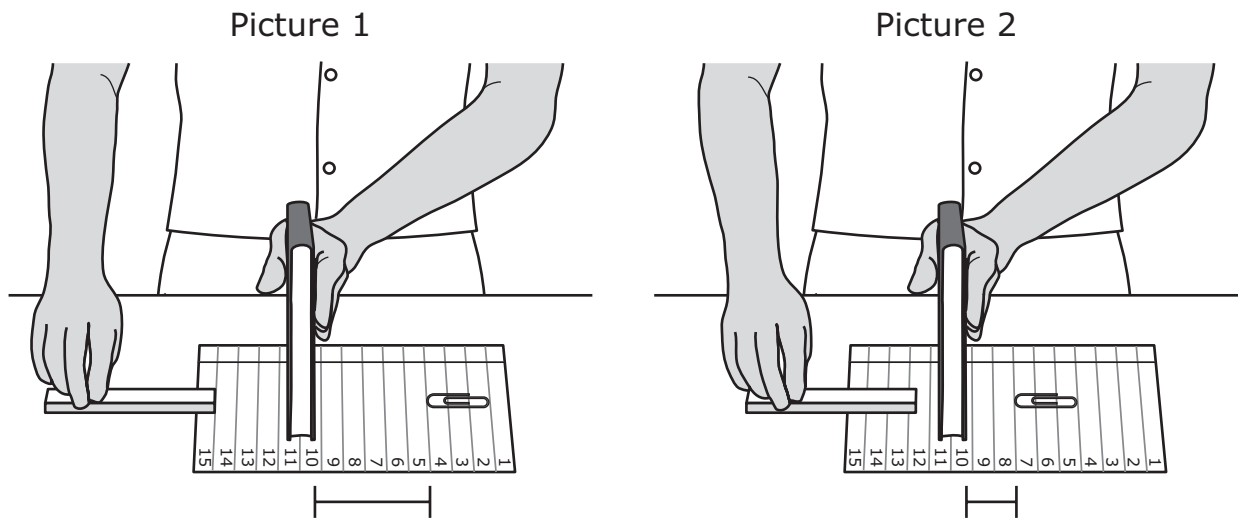
Fish	Photograph	Description of Mouth
Parrotfish	 <p style="text-align: right; font-size: small;">© eaglerayjoe/iStock/Thinkstock</p>	<ul style="list-style-type: none"> • Jaws form a strong, parrot-like beak • Grinding plates inside the mouth
Koi	 <p style="text-align: right; font-size: small;">© John M. Chase/iStock/Thinkstock</p>	<ul style="list-style-type: none"> • Soft mouth with no teeth • Mouth located on the underside of the head
Goby	 <p style="text-align: right; font-size: small;">© Eric Isselée/iStock/Thinkstock</p>	<ul style="list-style-type: none"> • Small mouth • Lower jaw extends out farther than upper jaw
Seahorse	 <p style="text-align: right; font-size: small;">© Eric Isselée/iStock/Thinkstock</p>	<ul style="list-style-type: none"> • Small mouth • Mouth located at the end of a long, tube-like snout

Which of these fish has mouth structures that allow it to eat algae by taking large bites of the hard coral on which the algae grows?

- F** Parrotfish
- G** Koi
- H** Goby
- J** Seahorse

- 9 Some buildings and homes are heated by energy produced from an alternative to fossil fuels. Which of these is an example of a building or home heated using an alternative energy source?
- A A home heated by energy generated by a hydroelectric dam
 - B A building that has emergency electric generators that run on gasoline
 - C A home heated by energy produced from a coal power plant in a city
 - D A building that has furnaces powered by natural gas

- 10 The two pictures show part of an investigation. A magnet, a book, and a paper clip are on a sheet of lined paper. In Picture 1 a student slides a magnet closer to the book. The student holds the book still in both pictures.



Which statement about this investigation can be supported by the result shown?

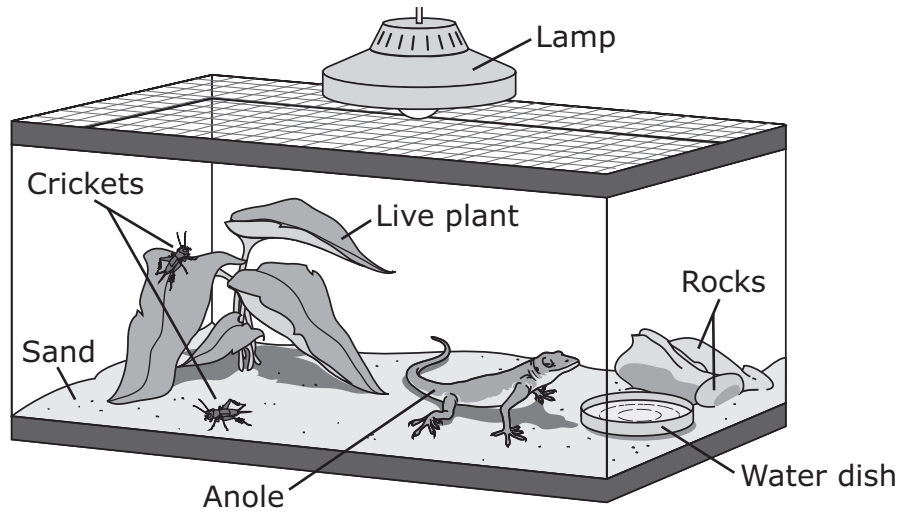
- F Work was done on the magnet, the book, and the paper clip.
- G Work was done on the magnet and the paper clip only.
- H Work was done on the magnet and the book only.
- J Work was done on the magnet only.

- 11** A student fills two identical beakers with the same volume of water. The student places one beaker in a freezer and the other beaker on a hot plate. After 5 minutes the student observes that the temperature of the water in the freezer is 19°C and the temperature of the water on the hot plate is 42°C .

Which statement best describes the relationship between the two beakers of water and the freezing and boiling points of water?

- A** The temperature of the water on the hot plate must increase 58°C before it boils, and the temperature of the water in the freezer must decrease 32°C before it freezes.
- B** The temperature of the water on the hot plate is closer to the boiling point than the temperature of the water in the freezer is to the freezing point.
- C** The temperature of the water in the freezer must decrease 19°C before it freezes, and the temperature of the water on the hot plate must increase 170°C before it boils.
- D** The temperature of the water in the freezer is closer to the freezing point than the temperature of the water on the hot plate is to the boiling point.

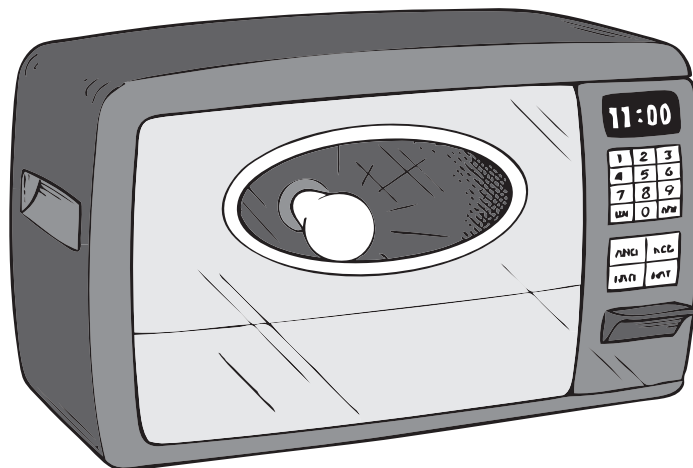
- 12** Green anole lizards are bright-green reptiles native to the southeastern United States and the Caribbean islands. They can be kept in terrariums to study their behavior and how they interact with their environment.



Which observation describes this anole lizard interacting with the living elements in its environment?

- F** The anole rested on one of the rocks and lifted its head toward the light.
- G** The anole climbed the plant and then ate a cricket off one of the leaves.
- H** The anole drank some water and then ran across the sand.
- J** The anole jumped from the rock and scattered sand with its tail.

13 The toy oven shown uses a lightbulb to bake small cakes.



What types of energy does the toy oven use to bake the cakes?

- A** Electrical and thermal
- B** Mechanical and electrical
- C** Thermal and mechanical
- D** Light and sound

14 Which list contains only processes that must occur in order for fossil fuels to form?

- F** Formation of faults, burial, glacier formation
- G** Organism growth, burial, volcanic eruptions
- H** Organism growth, burial, compaction
- J** Erosion, burial, earthquakes

- 15** A group of students visited a park and collected leaves from many different trees in order to study them. They recorded their observations about the leaves.

Which of these observations does NOT describe an inherited trait?

- A** The leaves vary in shape and size.
- B** Some leaves have holes made by insects chewing on them.
- C** Some leaves are smooth on one side and rough on the other.
- D** The colors of the leaves range from light green to dark green.

- 16** This photograph shows a girl using a lab instrument during an investigation on light. A teacher asks the other students in the class to look carefully at the girl's eye and give reasons for its appearance.



© Jacek Chabraszewski/Dreamstime.com

Which table correctly identifies the reasons for the appearance of the girl's eye through the lab instrument?

Reasons for Eye's Appearance

F	Magnification by the instrument	✓
	Refraction through the instrument	
	Reflection off the instrument	✓
	Light moving in straight lines	✓

Reasons for Eye's Appearance

G	Magnification by the instrument	✓
	Refraction through the instrument	✓
	Reflection off the instrument	
	Light moving in straight lines	✓

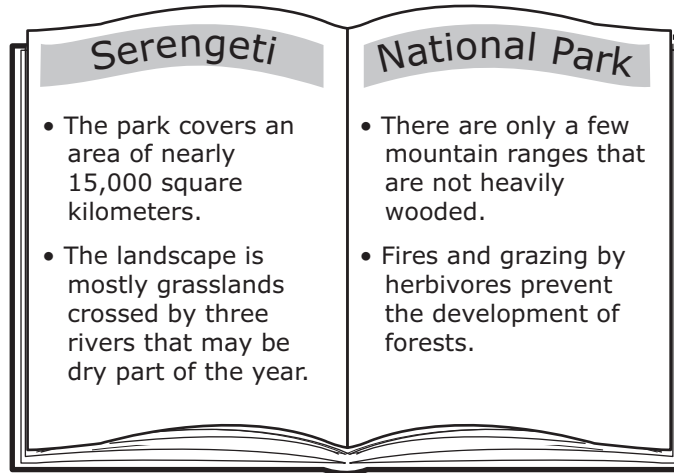
Reasons for Eye's Appearance

H	Magnification by the instrument	
	Refraction through the instrument	✓
	Reflection off the instrument	✓
	Light moving in straight lines	

Reasons for Eye's Appearance

J	Magnification by the instrument	✓
	Refraction through the instrument	✓
	Reflection off the instrument	✓
	Light moving in straight lines	

- 17 A student studying East Africa reads these facts about the Serengeti National Park in Tanzania.



The student thinks that parts of Texas are probably similar to the Serengeti. Based on the following descriptions, which of these Texas animals would be least likely to live in the Serengeti's grasslands?

Burrowing Owl

A

- Small owl with long legs
- Lives in areas with many species of short plants
- Often nests in abandoned rodent tunnels

Pileated Woodpecker

C

- Large woodpecker; about 42 cm long
- Nests in mature trees in densely forested areas
- Loud and destructive to trees

Pronghorn

B

- Large herbivore; about 1 m tall at the shoulder
- Lives in open areas with short plants to graze
- Second-fastest land animal

Black-Tailed Jackrabbit

D

- Large rabbit with long ears
- Lives in areas with short plants where predators are visible
- Often lives in areas that have been grazed by livestock

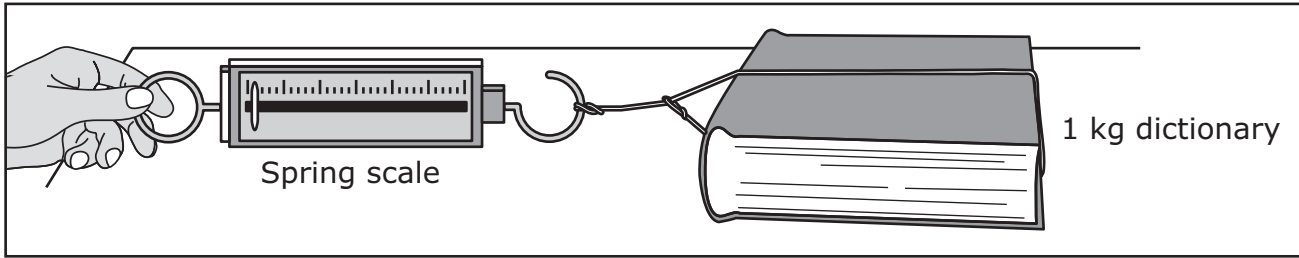
- 18** A student is asked to design a sleeve for a cup that will insulate thermal energy and not feel hot to the touch when the cup is filled with hot liquid.



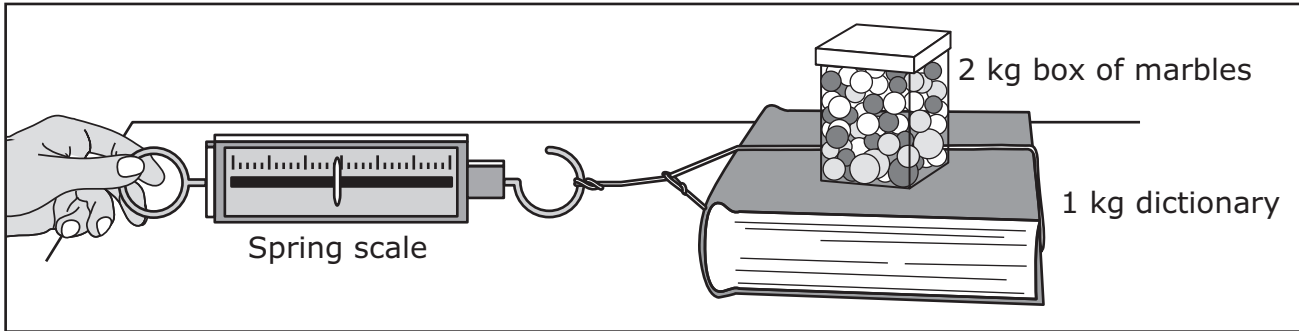
The student has four materials to choose from. Which of these materials is least useful as an insulator?

- F** Cardboard
- G** Aluminum
- H** Rubber
- J** Plastic

- 19 The diagrams show two trials of an experiment in which a spring scale was used to measure force.



Trial 1

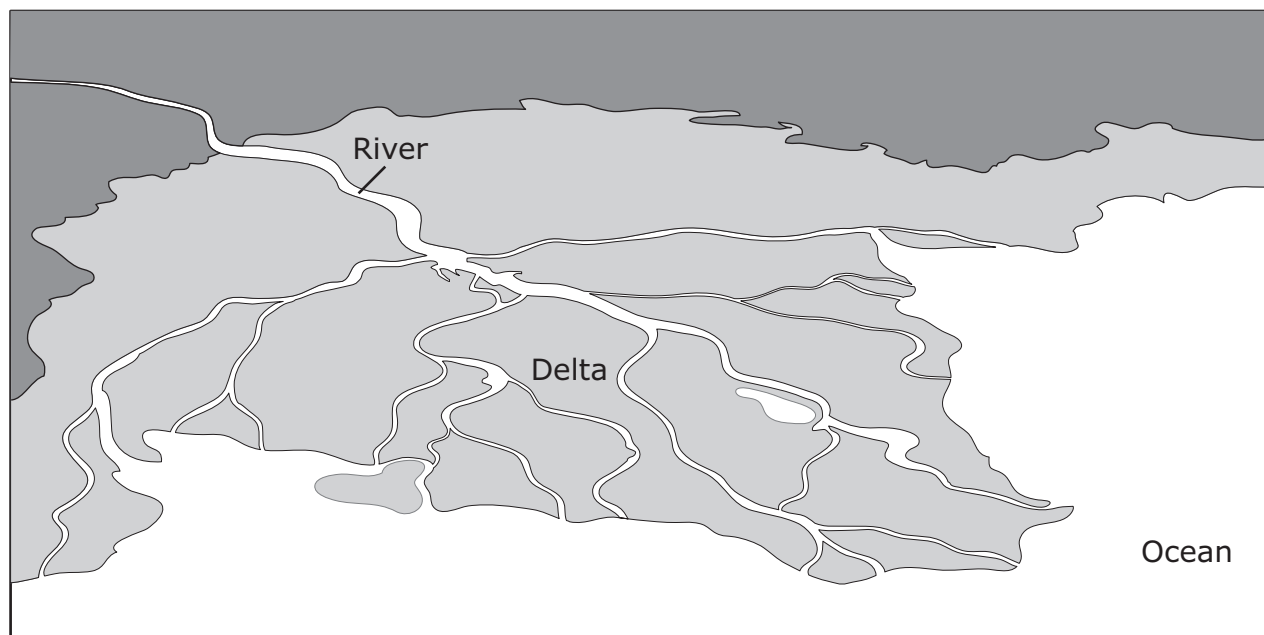


Trial 2

This experiment can be used to determine —

- A how mass affects the force needed to move objects
- B how force affects the mass of two objects
- C how the force used to pull a dictionary affects the mass of a box of marbles
- D how the mass of a box of marbles affects the mass of a dictionary

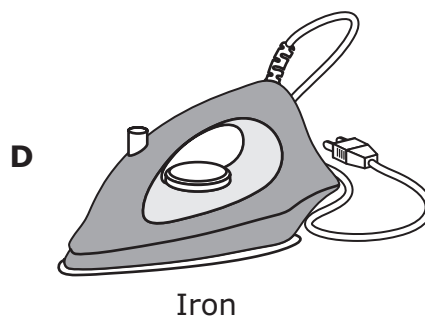
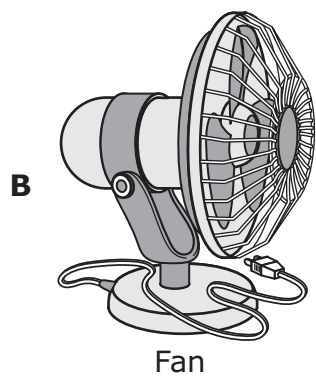
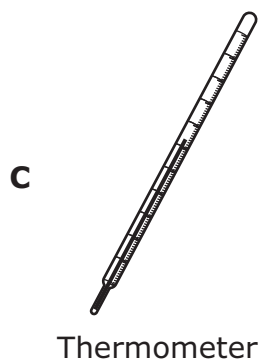
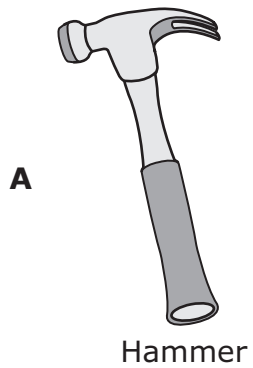
20 The size and shape of a delta can change over time.



The size and shape of this delta over time are NOT likely to be changed by —

- F** the number and height of tides along the shore
- G** the amount and size of sediments carried by the river and streams
- H** the amount of hunting and fishing in the delta
- J** the number and size of waves from the ocean that reach the shore

21 Which object requires only mechanical energy to perform its main function?



- 22** Big Bend National Park is located in the part of the Chihuahuan Desert that is in southwestern Texas. The table below lists some of the types of animals that live in Big Bend and what they eat.

Animals in Big Bend

Type of Animal	Food Sources
Ornate box turtle	Insects, dead animals, cacti
Roadrunner	Scorpions, lizards, rattlesnakes, mice
Rock squirrel	Grasses, mesquite beans, juniper berries
Turkey vulture	Decomposing animals
Western rattlesnake	Rabbits, mice, rats, birds, rock squirrels

Based on the information in the table, which of the following food chains shows one way energy flows in the Big Bend ecosystem?

- F** Juniper berries → ornate box turtles → roadrunners → rock squirrels
- G** Grasses → rock squirrels → roadrunners
- H** Cacti → ornate box turtles → turkey vultures
- J** Mesquite beans → turkey vultures → roadrunners → western rattlesnakes

23 Some ways to separate mixtures are listed below.

Ways to Separate Mixtures

1. Boil the mixture to evaporate the water
2. Pass a magnet over the mixture
3. Pour the mixture through a paper filter
4. Use tweezers

A student is given a beaker containing gravel and water. Which of these ways could the student NOT use to separate the gravel from the water?

- A** 1
- B** 2
- C** 3
- D** 4

24 Which of these correctly describes the relationship between plants and animals in the carbon dioxide-oxygen cycle?

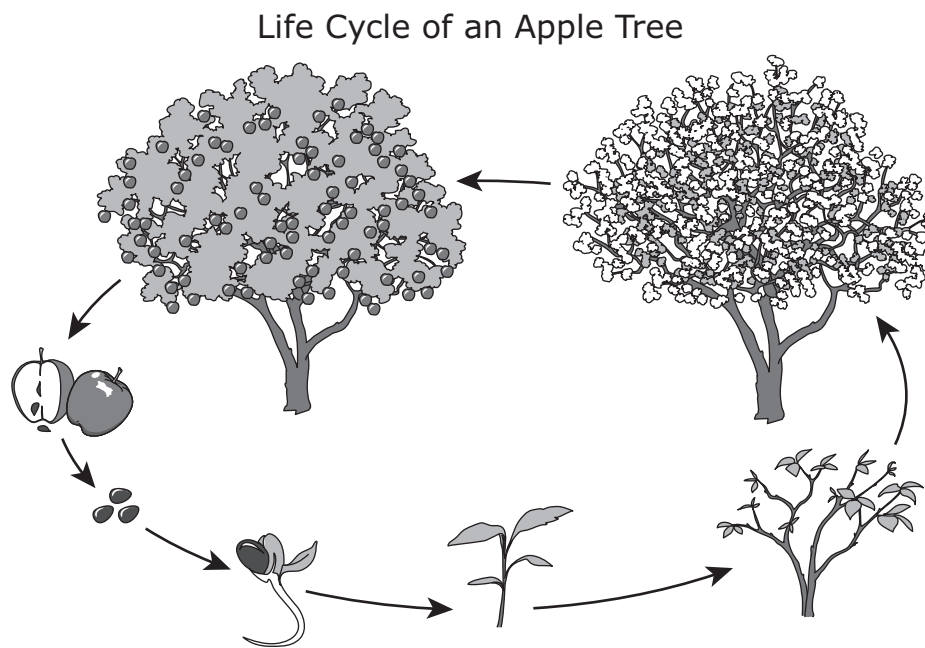
- F** Plants produce and release the oxygen that animals need to breathe.
- G** Plants produce and release the carbon dioxide that animals need to breathe.
- H** Animals produce and release the oxygen that plants need to make their own food.
- J** Animals produce and release the oxygen that plants convert to carbon dioxide.

- 25** A student builds a model of the solar system that includes a sphere representing Earth. The sphere turns in a full circle on its axis.

By using a model of Earth that spins on its axis, the student can best demonstrate —

- A** the cycle of the four seasons
- B** the aging of a star
- C** the passing of a year
- D** the cycle of day and night

-
- 26** One stage in the life cycle of an apple tree is the release of seeds.

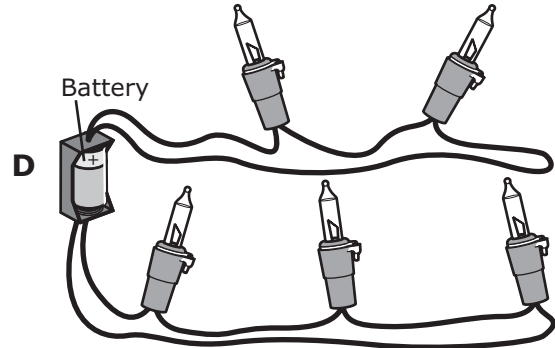
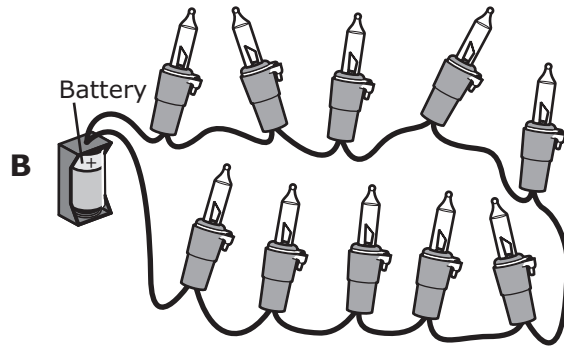
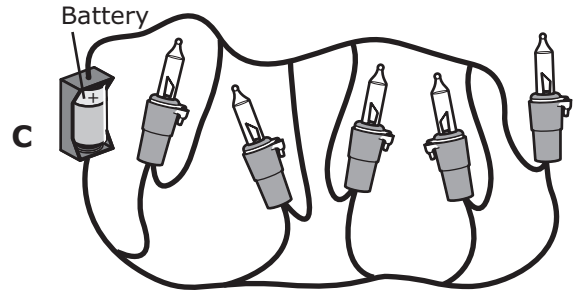
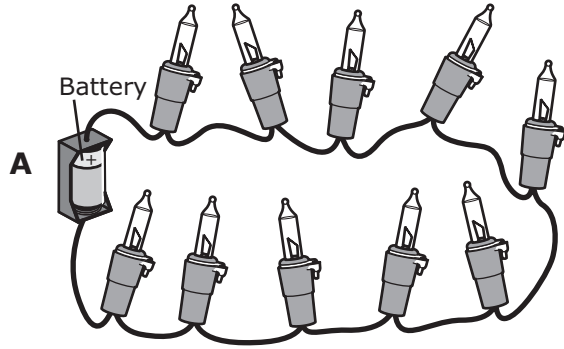


Which of these animal activities is most like the stage of the life cycle in which seeds are released?

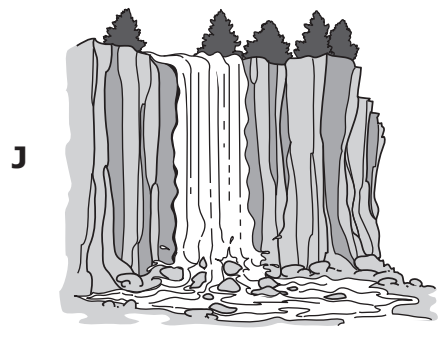
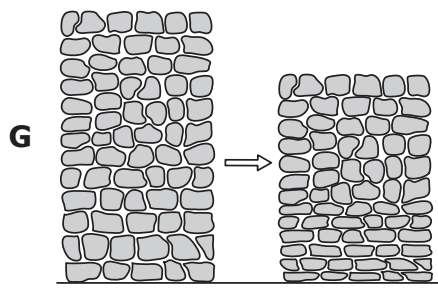
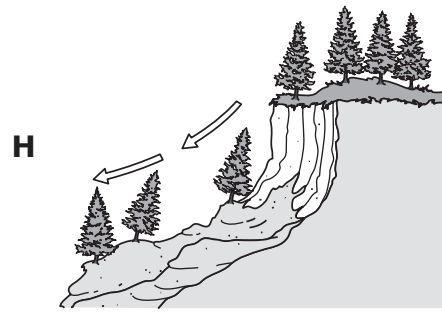
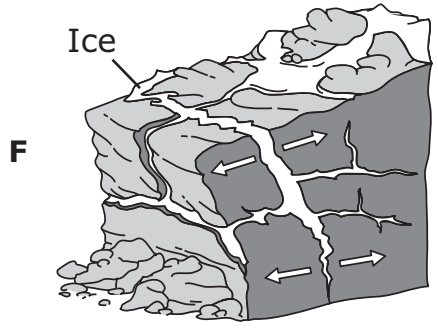
- F** A snake shedding its skin
- G** A bird laying an egg
- H** A swarm of bees leaving a hive
- J** A tadpole growing into an adult

27 In some circuits that are used for decorating, one burned-out lightbulb will prevent all the other lightbulbs from lighting. In other circuits, one burned-out lightbulb will have no effect on the other lightbulbs.

In which of these circuits will the other lightbulbs still light even if one bulb is burned out?



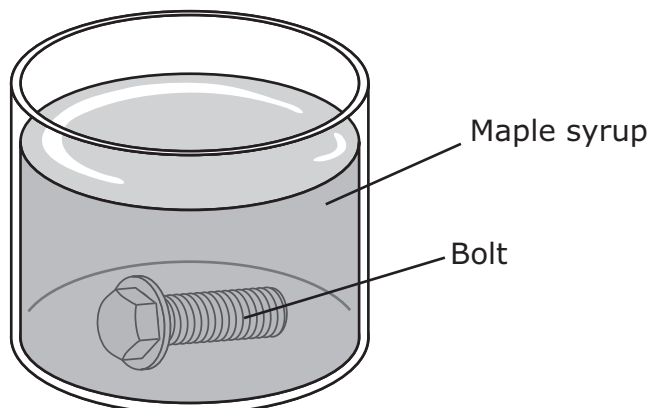
28 Which diagram models the process of compaction leading to the formation of sedimentary rock?



29 Which of these is a behavior that a person learns rather than inherits?

- A Swallowing a sweet liquid
- B Having a pleasant dream
- C Digesting a chocolate-covered strawberry
- D Identifying the scent of a rose

- 30** For an investigation a teacher dropped a bolt into a container of maple syrup and asked students to remove it without touching the syrup. The students first tried to use a strong magnet to remove the bolt, but it remained on the bottom of the container. They finally poured the syrup into another container to get the bolt out.



Which of these best describes some of the bolt's physical properties?

- F** The bolt is magnetic and has the same density as the maple syrup.
- G** The bolt is nonmagnetic and more dense than the maple syrup.
- H** The bolt is nonmagnetic and less dense than the maple syrup.
- J** The bolt is magnetic and less dense than the maple syrup.

- 31** Newly hatched chicks of many types of birds, such as parrots, are covered in soft, fluffy down feathers. These feathers contain many small spaces where air gets trapped.

In some animal species, such as Arctic foxes, the fur covering the animal's body consists of hollow strands of hair filled with air.

The primary role of the air trapped in the down feathers and fur is most likely to —

- A** act as a cushion to prevent injuries from falls
- B** decrease the amount of energy needed for running or flying
- C** provide a layer of insulation to help control body temperature
- D** supply oxygen to be absorbed through the skin for transport to the lungs

-
- 32** The picture shows an area of Yosemite National Park.



Which statement about light is supported by this picture?

- F** Light travels in straight lines until it enters a different material like water in a lake.
- G** Light can refract in air and in clear water.
- H** The water in the lake is blue because light forms an image.
- J** Light is reflected off the smooth surface of the lake.

- 33** Many gardeners use red worms like the ones shown in the photograph to turn vegetable and fruit scraps into topsoil for plants. The gardeners build a worm farm in a large container lined with old newspapers and filled with moist garden soil. The worms eat about half their body weight daily and produce waste that can be used as plant fertilizer.



© Andrey Shupilo/Dreamstime.com

The container for a worm farm needs to have a lid, but the lid must be left partially open because worms require which of the following in order to survive?

- A** Oxygen
- B** Sunlight
- C** Carbon dioxide
- D** All of these

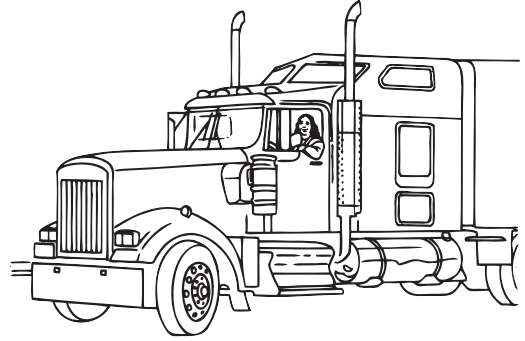
34 Which of these shows a person using an alternative energy source to perform a task?

F



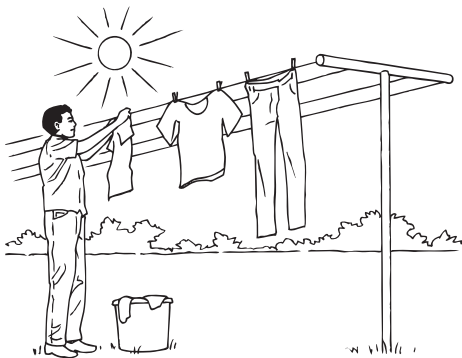
Using a gasoline-powered mower

H



Driving a diesel truck

G



Drying laundry in the sun

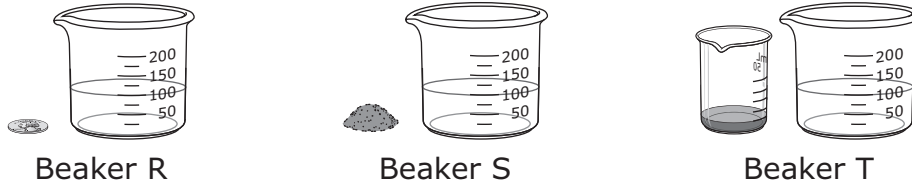
J



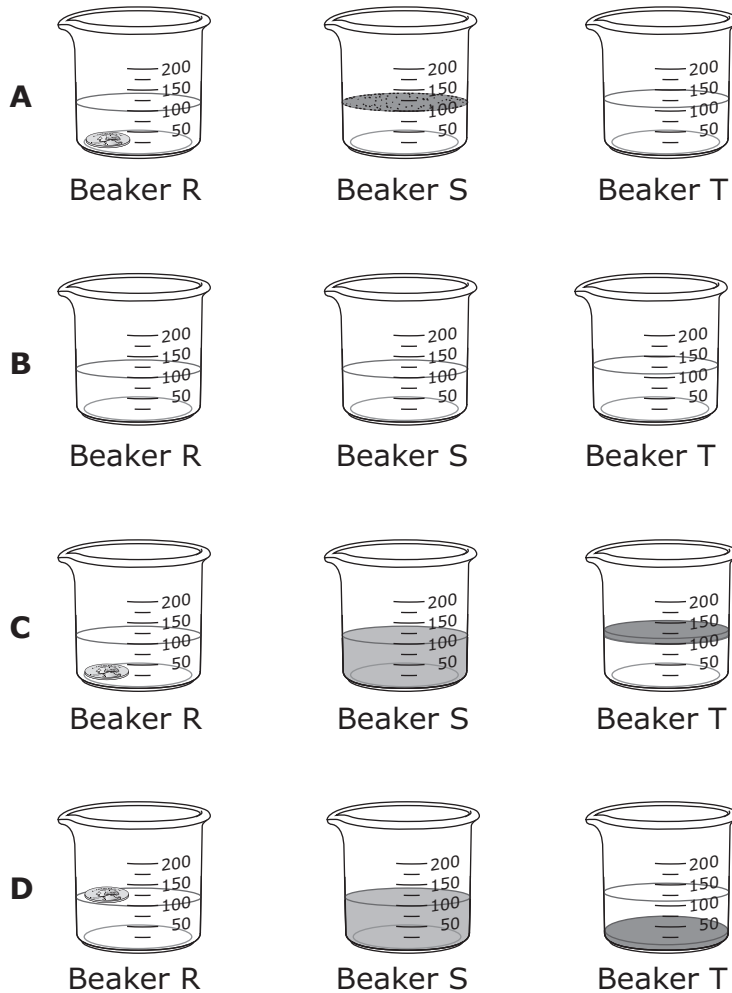
Cooking on a gas stove

- 35** For an investigation a student put 100 mL of water at room temperature into each of three beakers. Then the student added a coin to Beaker R, 3 g of a powdered drink mix to Beaker S, and 10 mL of lamp oil to Beaker T. The student stirred the contents of the beakers and then left them sitting on a lab table for 5 minutes.

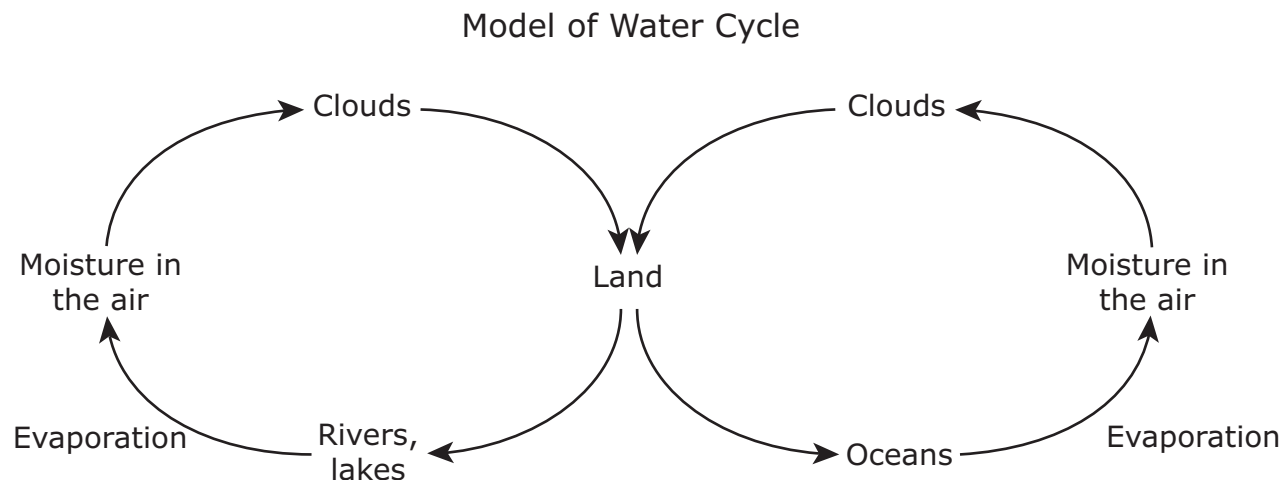
Materials Used in Investigation



Which diagram shows what the student most likely observed in each of the beakers after 5 minutes?



- 36** The model below shows where water can be found during different stages of the water cycle.



What should be added to the diagram to better explain the water cycle?

- F** Soil to trap water from runoff
- G** The sun to provide energy for evaporation
- H** Rocks to release thermal energy
- J** Plants to provide oxygen in the atmosphere



**STAAR
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