

**GRADE 5**  
**Science**

**Administered May 2019**

**RELEASED**

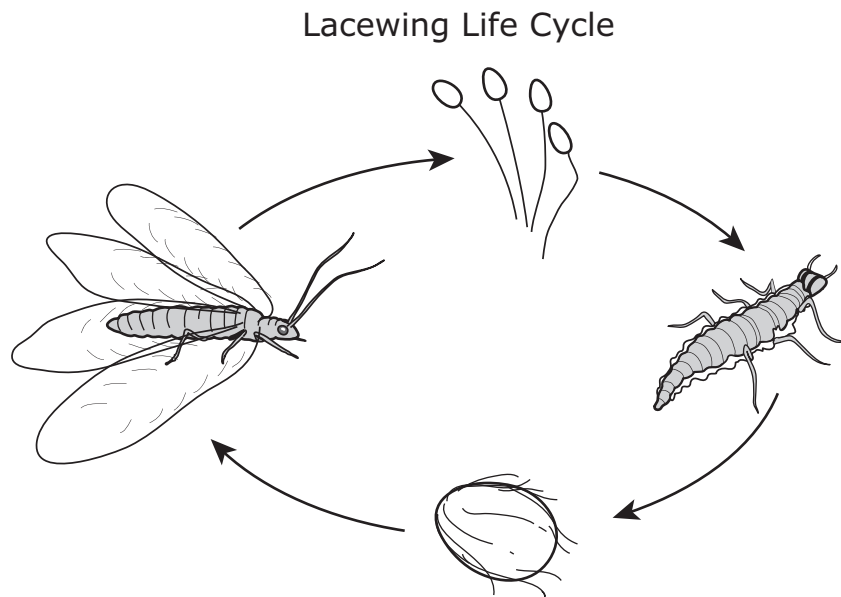


# SCIENCE

## 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 Lacewings are insects that hatch from eggs.



Which of these correctly compares the lacewing life cycle with the frog life cycle?

- A Adult lacewings lay eggs, but adult frogs give birth to live larvae.
- B When they hatch, young lacewings and young frogs look different from their adult forms.
- C When they hatch, both lacewings and frogs have long legs for jumping.
- D Both adult lacewings and adult frogs have more legs than they had as larvae.

- 2** Which of the following explains how water undergoes a change of state in one stage of the water cycle in order to move from the ocean's surface into the air?
- F** Liquid water that is heated by the sun becomes a gas and rises.
  - G** Gaseous water rises as it is cooled by the ocean.
  - H** Liquid water that is heated by the sun condenses into rain.
  - J** Gaseous water collects in drops of fog above the ocean's surface.

- 3 Students investigate the physical properties of some substances. They draw a table to show how the substances can be grouped. The students need to complete the table with column headings.

Physical Properties of Substances

?	?	?
<ul style="list-style-type: none"><li>• Aluminum foil</li><li>• Brass key</li><li>• Gold ring</li></ul>	<ul style="list-style-type: none"><li>• Cooking oil</li><li>• Soap bubble</li><li>• Wood chip</li><li>• Feather</li></ul>	<ul style="list-style-type: none"><li>• Baking soda</li><li>• Drink mix</li><li>• White sugar</li></ul>

Which column headings should the students use for their table?

**A**

Good Insulators of Thermal Energy	Is Attracted by Magnets	Same Physical State
-----------------------------------	-------------------------	---------------------

**B**

Good Conductors of Electrical Energy	Less Dense than Water	Soluble in Water
--------------------------------------	-----------------------	------------------

**C**

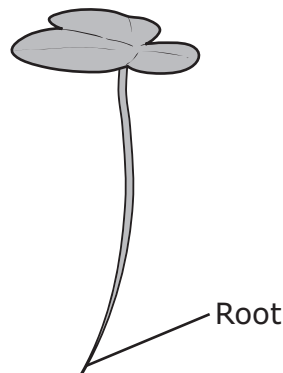
Soluble in Water	Same Physical State	Less Dense than Water
------------------	---------------------	-----------------------

**D**

Is Attracted by Magnets	Good Conductors of Electrical Energy	Good Insulators of Thermal Energy
-------------------------	--------------------------------------	-----------------------------------

- 4 Which change occurs when lemon juice is mixed with water?
- F The mass of the lemon juice decreases.
  - G The water becomes a solid.
  - H The lemon juice dissolves and spreads out evenly in the water.
  - J The volume of the water decreases.
- 

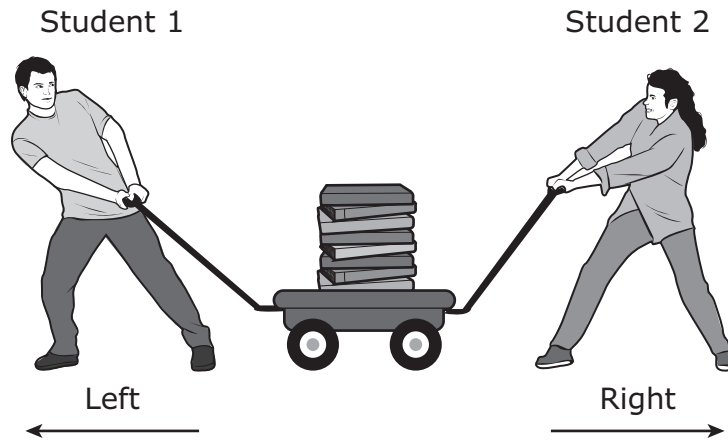
- 5 Common duckweed is a small plant that grows on the surface of many ponds and lakes. It is free floating and has a single root.



Which statement describes the type of ecosystem in which duckweed can most likely be observed?

- A A wetland ecosystem with slow-moving water
- B A coastal ecosystem with constant rough waves
- C A desert ecosystem where rainfall drains away quickly
- D An underground river ecosystem where the temperature remains constant

6 Students fill a cart with books. The cart has a handle on each end.



Which actions will make moving the cart in one direction easiest for the students?

- F** Student 1 pulls the cart to the left while Student 2 pulls the cart to the right.
- G** Student 1 pulls the cart to the left while Student 2 pushes the cart to the left.
- H** Student 1 pushes the cart to the right while Student 2 pushes the cart downward.
- J** Student 1 pushes the cart to the right while Student 2 pulls the cart upward.



7 The table lists the ingredients of five different mixtures.

Mixtures and Their Ingredients

Mixture	Ingredients
1	Salt, hot water, sand
2	Sugar, hot water, salt
3	Iron filings and sand
4	Pebbles, wood chips, soil
5	Powdered soap and hot water

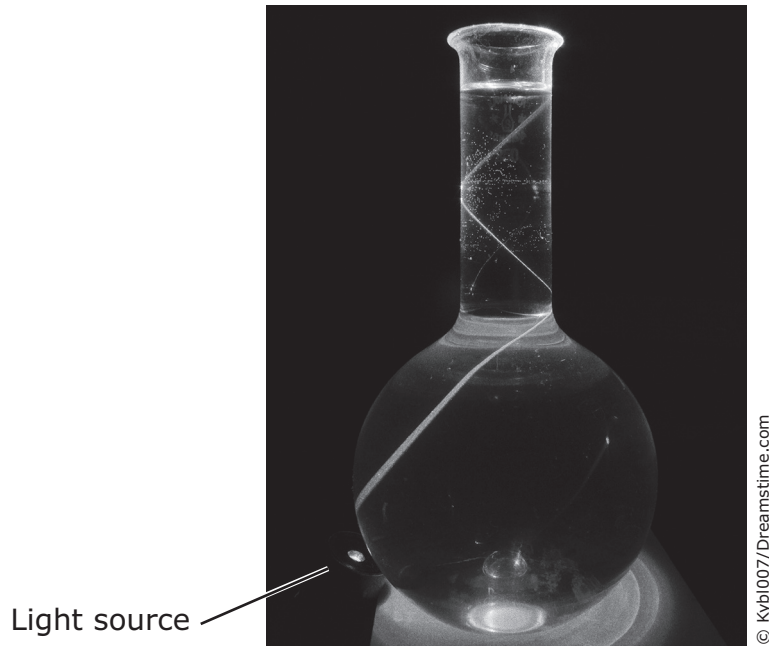
In which mixtures do all the ingredients maintain their physical state?

- A Mixtures 3 and 4 only
  - B Mixtures 1, 3, and 4
  - C Mixtures 1, 2, and 5
  - D Mixtures 2 and 5 only
- 

8 Which statement correctly describes how a landform is formed?

- F A lake is formed when flowing water carves out the sides of a canyon.
- G A mountain range is formed when glaciers slowly move across the landscape.
- H A delta is formed at the mouth of a river when flowing water slows and deposits sediment.
- J A U-shaped valley is formed when winds pick up and move sediment away from the landscape.

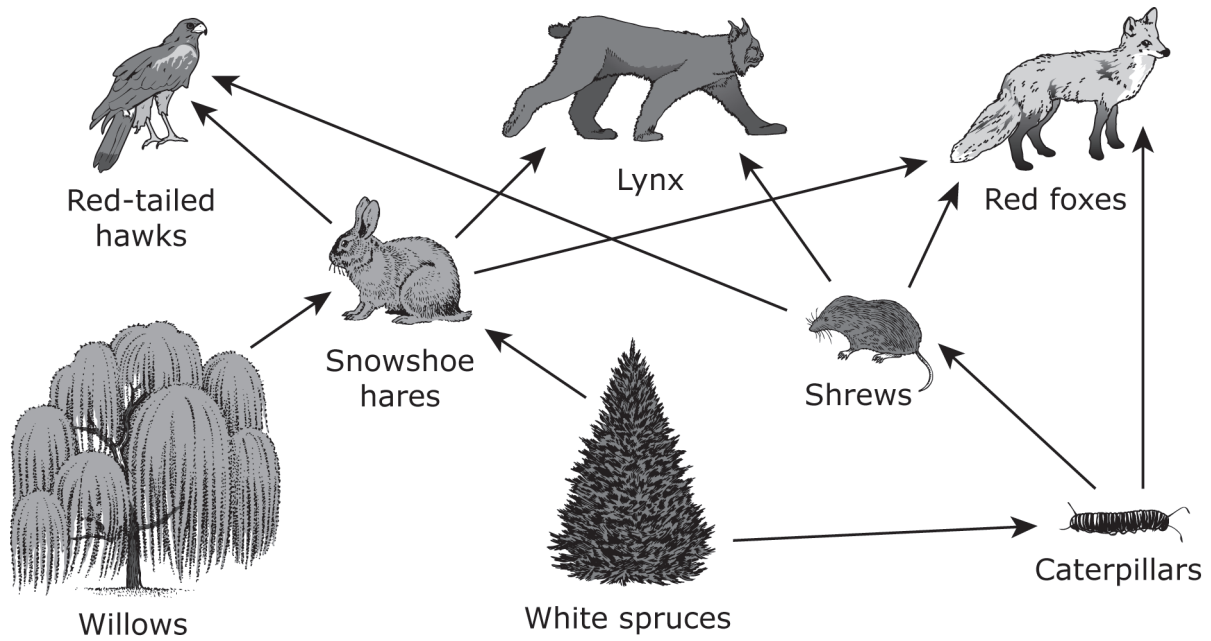
9 A thin beam of light is shown in this picture.



What does the picture demonstrate about light?

- A Light and its reflections travel in straight lines.
- B Light cannot reflect from more than one surface.
- C Light that goes through water cannot travel in straight lines.
- D Light can travel in a circular path.

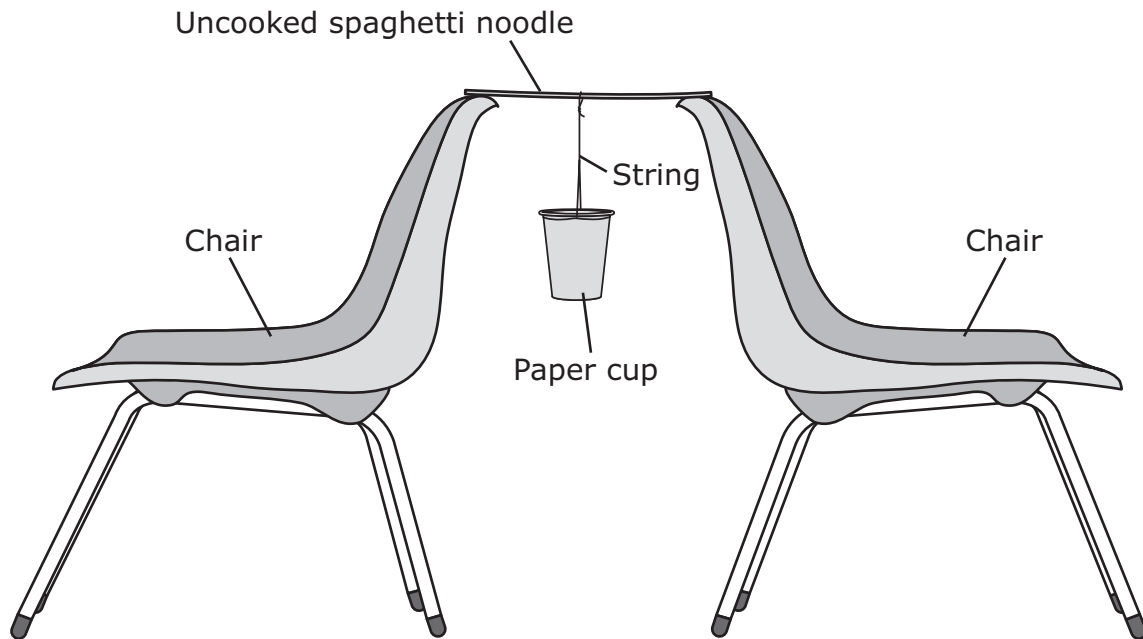
10 A partial forest food web is shown.



Which list contains only animals that receive energy transferred directly from consumers in this food web?

- F Red-tailed hawks, snowshoe hares, and caterpillars
- G Snowshoe hares and caterpillars
- H Snowshoe hares and shrews
- J Shrews and red foxes

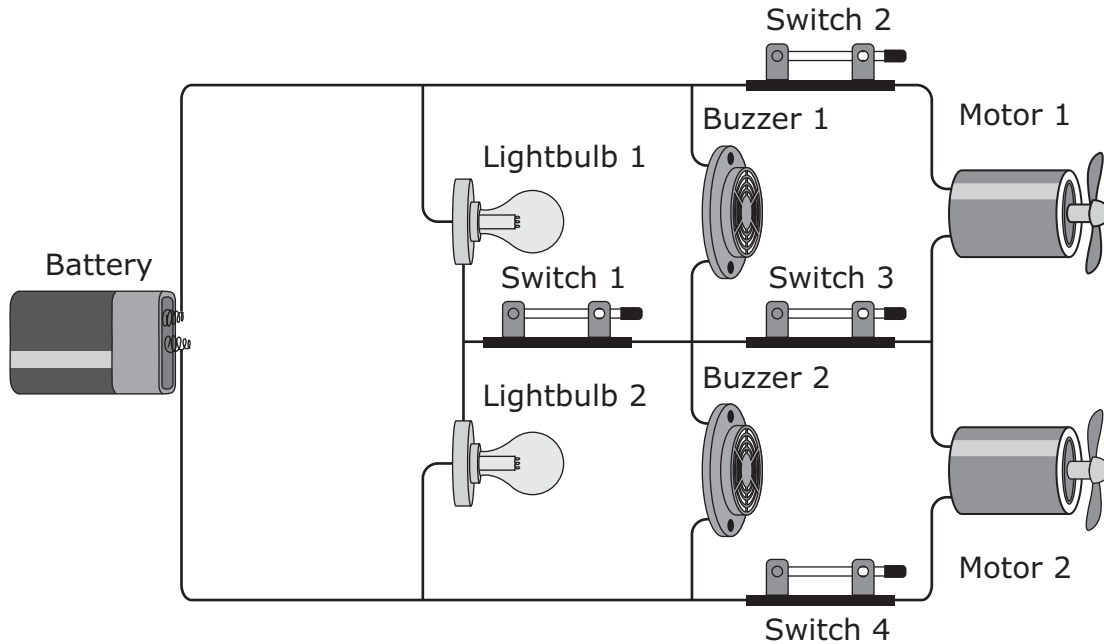
- 11** A student conducts the investigation shown in the diagram. In this experiment a paper cup hangs from a string tied to a single uncooked spaghetti noodle. The student measures and records the mass of a penny. The student then adds pennies to the paper cup one at a time.



Which question is the student most likely trying to answer with this investigation?

- A** How many spaghetti noodles will it take to hold up the mass of a penny?
- B** How much force will it take to break the spaghetti noodle?
- C** How long should the string that holds the paper cup be in order to support the greatest mass of pennies?
- D** How does the distance between the two chairs affect the amount of force it takes for the spaghetti noodle to break?

- 12** A student builds a circuit allowing the lightbulbs to light, the buzzers to make sound, and the motors to turn.

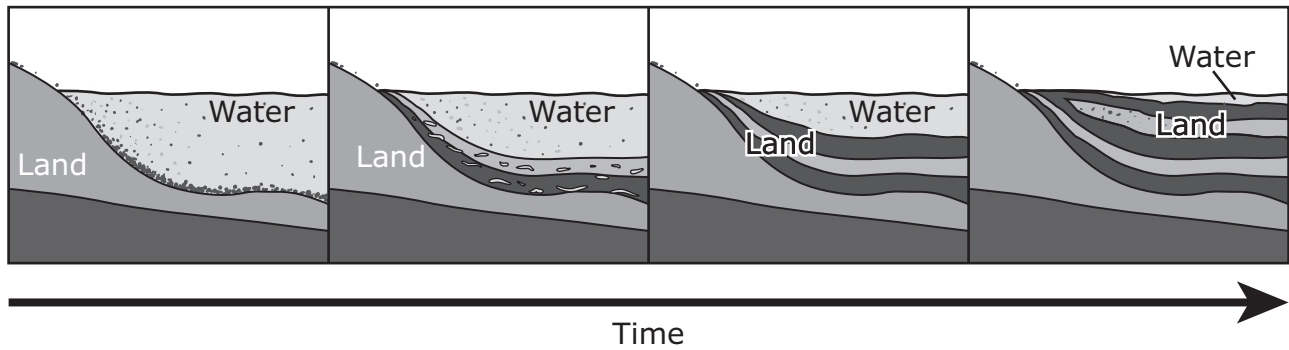


Which two switches can be open and still allow all of the parts to work?

- F** Switches 1 and 3
- G** Switches 1 and 4
- H** Switches 2 and 3
- J** Switches 3 and 4

13 The diagram shows parts of a process that occurred over time.

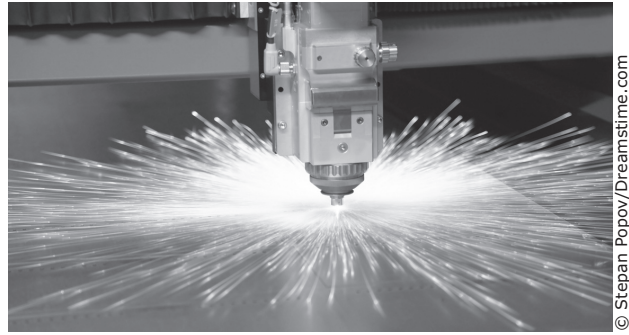
Process Over Time



Which process does this diagram most likely represent?

- A The erosion of a coastline
- B The deposition of sediments
- C The weathering of a mountain
- D The formation of a sea

- 14 The photograph shows a laser cutting a sheet of metal as the laser moves from one end of the metal to the other.



Four groups of students each made a table of examples of the different types of energy involved in this process. Which of these tables is correct?

**F**

Type of Energy	Example
Mechanical	The laser moves across the metal.
Thermal	Light reflects off the metal.
Sound	Sparks hit the floor.
Light	The metal turns red.

**H**

Type of Energy	Example
Mechanical	The laser produces a beam of light.
Thermal	The temperature of the metal rises.
Electrical	The laser is part of a circuit.
Sound	Pieces of metal hit the floor.

**G**

Type of Energy	Example
Mechanical	The laser produces sparks.
Thermal	The laser is part of a circuit.
Electrical	The light cuts the metal.
Sound	Sparks hit the floor.

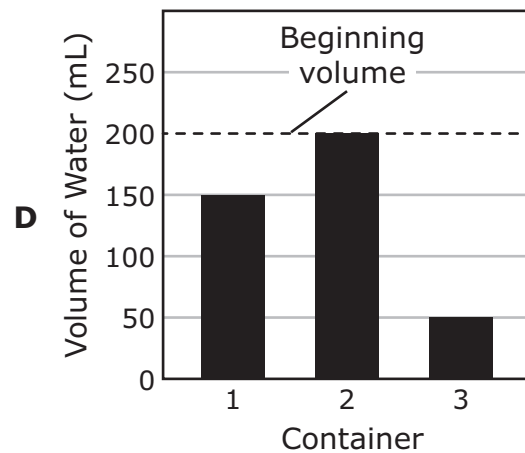
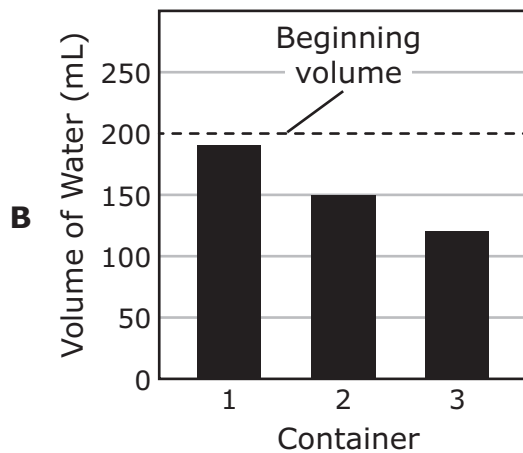
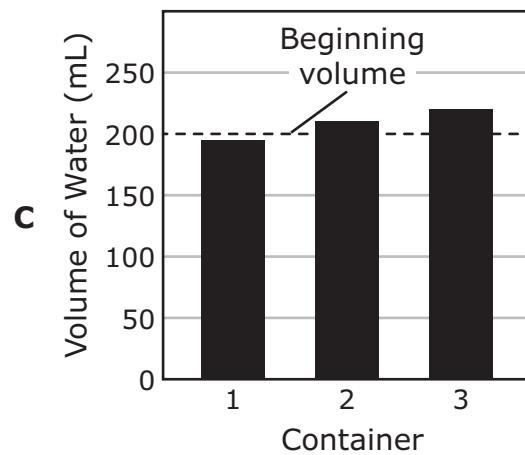
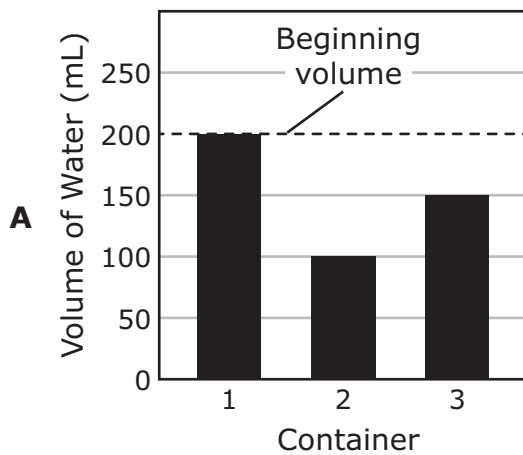
**J**

Type of Energy	Example
Mechanical	The laser moves across the metal.
Thermal	The laser produces sparks.
Sound	Pieces of metal hit the floor.
Light	The laser produces a beam of light.

- 15 Students plan to investigate the different states of matter. They will measure the volume of water in three containers after five days. They make this table to organize the data.

Container	Volume of Water (beginning)	Temperature of Water (beginning)	Location of Container	Volume of Water (after five days)
1	200 mL	24°C	Inside a refrigerator	?
2	200 mL	24°C	On a desk in front of low-speed fan	?
3	200 mL	24°C	On a sunny windowsill in front of an opened window	?

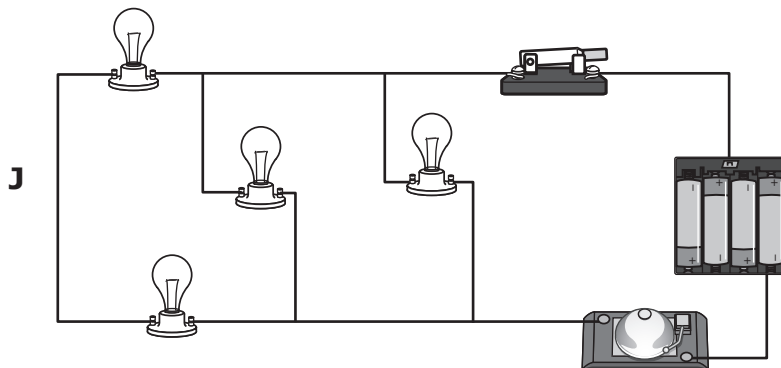
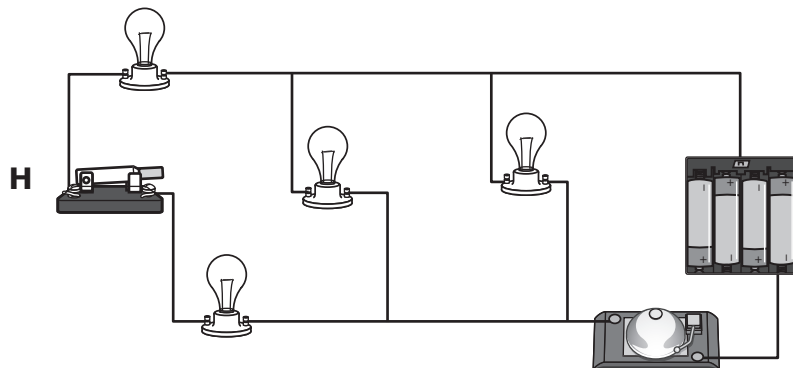
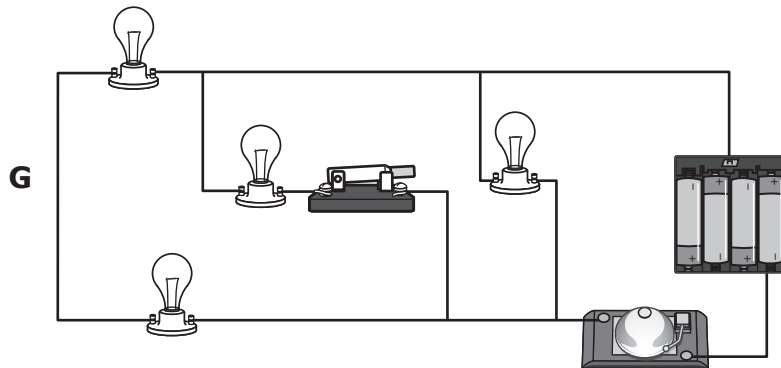
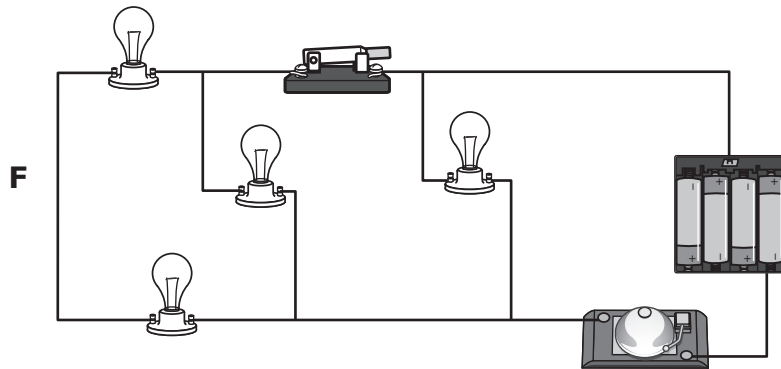
Which graph represents the volume of water most likely left in the containers after five days?



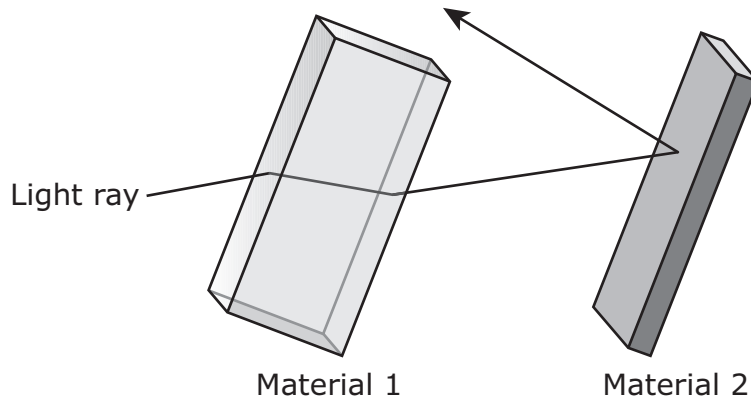


**16** A student wants to build a circuit with four lightbulbs and one bell. The student wants to place a switch in the circuit so that only one light will still be on and the bell will still ring when the switch is opened.

Which of these circuits should the student build?



17 The picture shows how a light ray behaves with two different types of materials.



Which table best describes the behavior of the light ray as it encounters the materials?

- A**
- | Material 1                                    | Material 2                  |
|---|-----------------------------|
| The light ray is scattered in all directions. | The light ray is refracted. |
- B**
- | Material 1                 | Material 2                  |
|----------------------------|-----------------------------|
| The light ray is absorbed. | The light ray is reflected. |
- C**
- | Material 1                    | Material 2                  |
|-------------------------------|-----------------------------|
| The light ray is transmitted. | The light ray is refracted. |
- D**
- | Material 1                  | Material 2                  |
|-----------------------------|-----------------------------|
| The light ray is refracted. | The light ray is reflected. |

18 Which of these environments could form coal if the area is buried for a long time?

F



© george kuna/Fotolia

H



© Podarilj/Dreamstime.com

G



© kanonsky/Fotolia

J



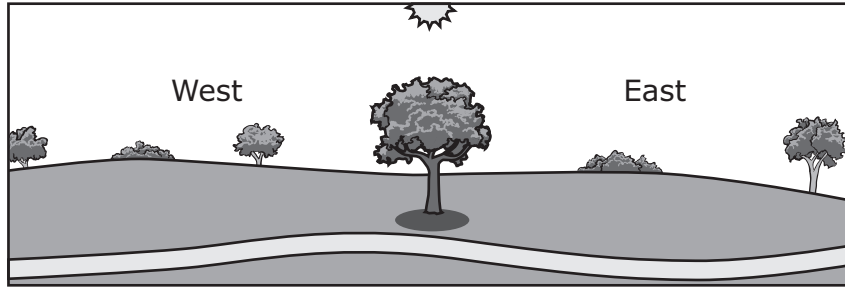
© Cosmopol/Dreamstime.com

---

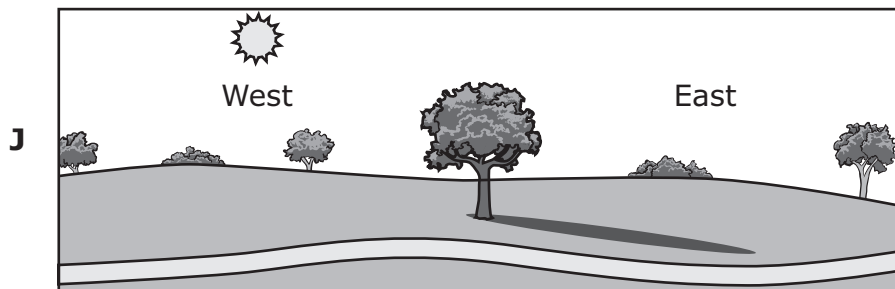
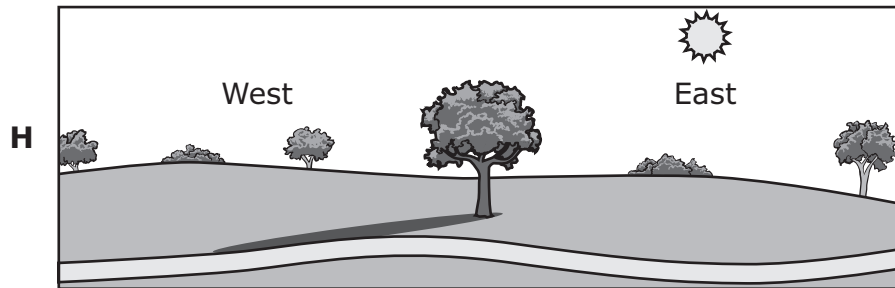
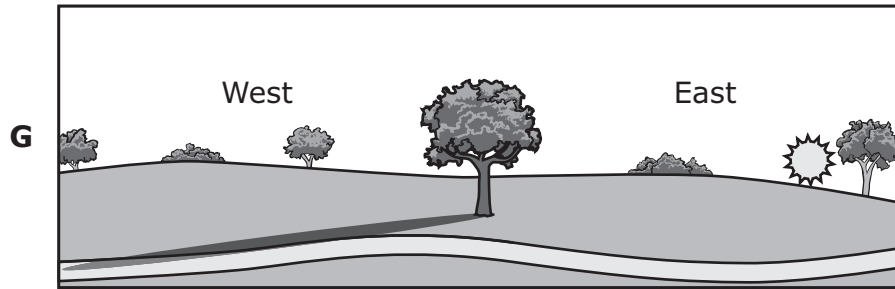
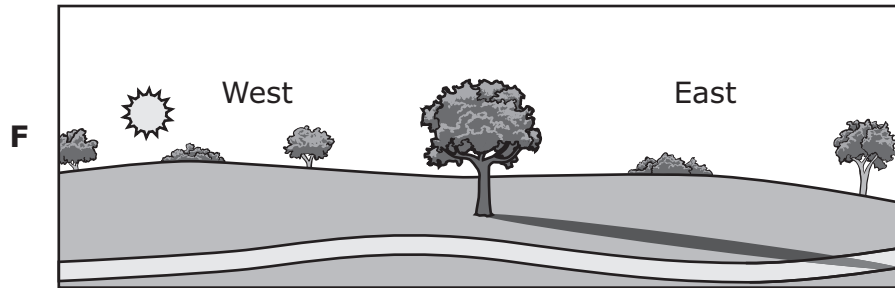
19 A zookeeper sets up a habitat for a certain species of rabbit. Which answer choice describes the rabbit as it interacts with two nonliving parts of the rabbit's habitat?

- A The rabbit breathing air while running down a rocky path
- B The rabbit licking its fur while feeding its young
- C The rabbit hiding under plants from loud noises
- D The rabbit nibbling on vegetation inside the habitat

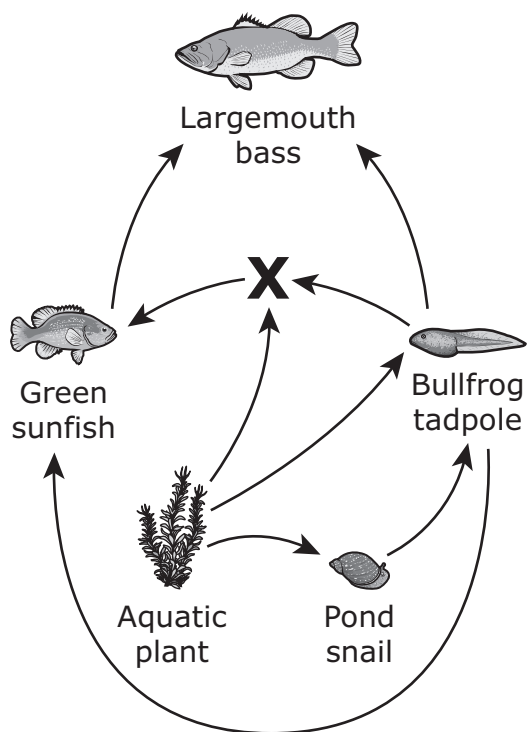
20 The diagram shows the shadow of a tree in a field at noon on a summer day.



The sun rises at 7:00 A.M. on this day. Which diagram best shows the shadow of the tree at 10:00 A.M. on the same day?



21 A student makes a partial Texas aquatic food web as shown.



Which type of organism should replace the X in the food web?

- A An omnivore
- B An herbivore
- C A carnivore
- D A producer

- 22** A student filled each of four beakers with 100 mL of water at 25 °C. The student added an equal amount of a different substance to each of the beakers of water.

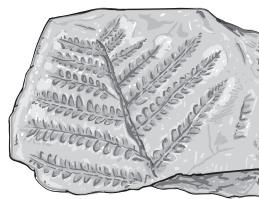
Student Investigation

Substance	Appearance	Observations When Stirring	Observations After Stirring Stopped
Iron filings	Silvery gray	Particles swirling around	Particles settled to bottom of beaker
Papain	White powder	Cloudy changing to clear	Clear; no visible particles
Talcum powder	White powder	Floating on surface in clumps	Collected on beaker walls above liquid
Vegetable oil	Yellow liquid	Oil in clumps moving around	Formed a layer on top of water

Based on the student's observations in the table, how many of the substances did NOT dissolve in the water?

- F** 1 substance
- G** 2 substances
- H** 3 substances
- J** 4 substances

- 
- 23** A scientist finds the plant fossil shown.



Which question can the scientist most likely answer by examining this fossil?

- A** What was the average monthly rainfall in the area?
- B** How much water was absorbed by the roots of the plant?
- C** How much oxygen was in the atmosphere surrounding the plant?
- D** What was the environment like in the area when the plant was alive?

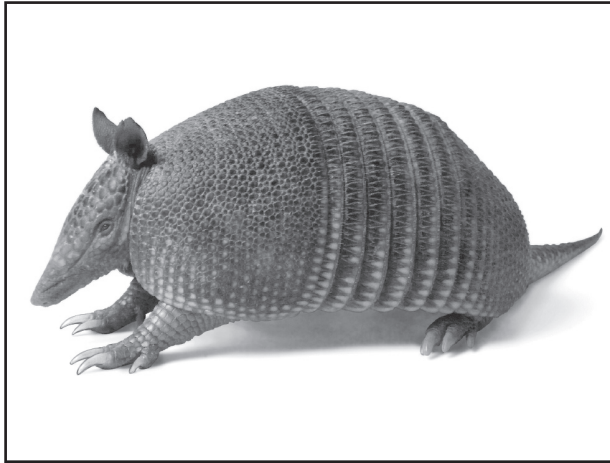
**24** The moon, the sun, and Earth have different physical characteristics. Which of these best describes a physical characteristic of the sun?

- F** It is solid and has many layers.
  - G** It rotates on its axis every 24 hours.
  - H** It is mostly made of hydrogen and helium.
  - J** It is smaller and has less gravity than Earth or the moon.
- 

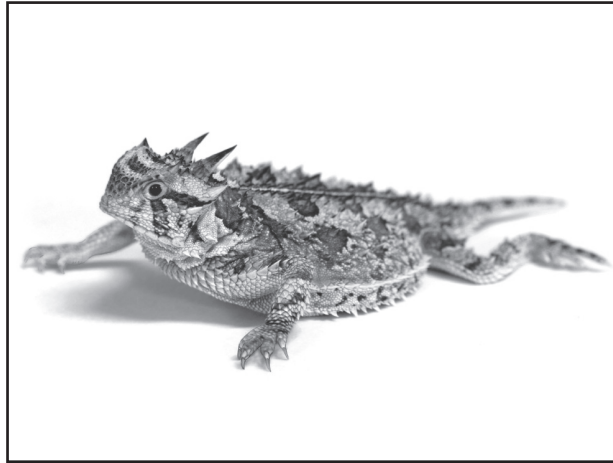
**25** Which landform is a result of rapid changes to Earth's surface?

- A** U-shaped valley
- B** Limestone cave
- C** Mountain range
- D** Volcanic island

26 The picture shows two animals that live in Texas.



© Batuque/Dreamstime #2260540



© texcroc/Stockphoto #7216571

Texas Nine-banded Armadillo

Texas Horned Lizard

Both animals have structures that help them survive. Which sentence best describes the function of the structures that these animals have in common?

- F** Both animals have small eyes that help them see clearly at night.
- G** Both animals have tough skin to keep them warm in cold weather.
- H** Both animals have sharp claws that help them to dig in sand.
- J** Both animals have pointed tails to attract predators.



27 A student observed and recorded some activities in an aquarium.

Observations

1. A fish eats flakes of fish food dropped into the aquarium.
2. A snail crawls over colored rocks at the bottom of the aquarium.
3. A fish eats leaves from a plant in the aquarium.
4. A snail lays eggs in a corner of the aquarium.
5. A fish swims through air bubbles being pumped into the aquarium.
6. A snail moves up a wall of the aquarium.

An interaction between two living parts of the environment is represented by —

- A Observations 1 and 2
- B Observation 3
- C Observations 4 and 5
- D Observation 6

---

28 A student read an article about natural resources and listed some resources in the chart shown.

Natural Resources

Coal	Air	Tree
Petroleum	Wheat	Natural gas
Sheep	Lake	Fish

Which answer choice best classifies the natural resources in the chart?

- F Renewable: coal, air, tree  
Nonrenewable: petroleum, wheat, natural gas, sheep, lake, fish
- G Renewable: coal, petroleum, natural gas, lake  
Nonrenewable: air, tree, wheat, sheep, fish
- H Renewable: tree, wheat, sheep, fish  
Nonrenewable: coal, air, petroleum, natural gas, lake
- J Renewable: air, tree, wheat, sheep, lake, fish  
Nonrenewable: coal, petroleum, natural gas

29 Which table correctly classifies statements about weather and climate?

**A**

Weather	Climate
Hail can form in thunderstorms that have strong winds.	The high temperature for Tuesday was 28 °C.

**B**

Weather	Climate
There will be thunderstorms tomorrow in the afternoon.	The month of February has had the coldest temperatures on record for thirty years.

**C**

Weather	Climate
August has the hottest temperatures each year.	A cold front is expected next week.

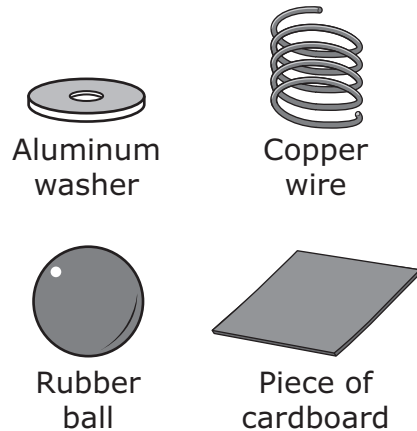
**D**

Weather	Climate
The high temperature for March is usually around 20 °C.	There are clear skies with no chance of rain for the next four days.

- 30 A student wants to classify four different objects based on physical properties. The student uses the questions shown in the table to test each object.

Materials	Physical Properties		
	Insulate Thermal Energy?	Float in Water?	Conduct Electrical Energy?
1	Yes	No	No
2	No	No	Yes
3	Yes	Yes	No
4	No	No	Yes

Materials



Which statement correctly identifies two of the materials based on the classification of properties in the table?

- F Material 1 is a rubber ball.  
Material 2 is a piece of cardboard.
- G Material 2 is an aluminum washer.  
Material 3 is a copper wire.
- H Material 3 is a piece of cardboard.  
Material 4 is an aluminum washer.
- J Material 1 is a copper wire.  
Material 4 is a rubber ball.

- 
- 31 Unlike humans, otters have special flaps that close off their nostrils and ears. These flaps help otters survive in an environment that is —

- A terrestrial
- B snowy
- C windy
- D aquatic

- 32** A student raises a parrot from the time it hatches. Which of these behaviors did the parrot most likely learn from living in the student's home?
- F** The parrot flaps its wings while sitting on a perch.
  - G** The parrot has a loud scream that hurts the student's ears.
  - H** The parrot imitates the family dog barking.
  - J** The parrot tucks its head under its wing when it sleeps.
- 

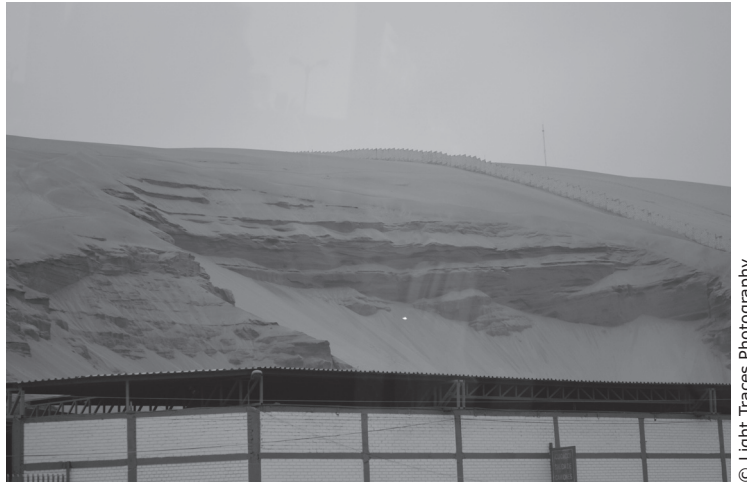
- 33** Eight activities that use energy are listed in the box.

1. A bus driver starts a bus.
2. A soccer player kicks a ball.
3. A teacher writes notes on a chalkboard.
4. A chef stirs soup on a stove.
5. A bird flaps its wings and chirps to attract a mate.
6. A basketball referee blows a whistle.
7. A waiter pours water into a glass.
8. A person changes the channel on a TV.

Each of these activities requires the use of which kind of energy?

- A** Thermal
- B** Mechanical
- C** Electrical
- D** Sound

**34** This photograph shows a fence between a sand dune and a road.



What is most likely the main reason this fence was built?

- F** To stop sand from sliding or blowing onto the road and covering it up
- G** To prevent a delta from forming at the bottom of the dune
- H** To keep water off the road
- J** To prevent marine animals from nesting on the dune

**35** A wooded habitat changes as a new road is built.



© iStock.com/Nina Hillitukha

How will building this road most likely affect this habitat?

- A** Soil erosion will decrease.
- B** Precipitation will increase.
- C** Animal populations will decrease.
- D** Plant reproduction will increase.

**36** A group of students makes observations about fish in a small aquarium.

Observations of Fish in an Aquarium

1. Most are about 10 cm long.
2. One of the fish looks sick.
3. Eight of the fish have black stripes.
4. Some fish can squeeze through small openings between rocks.
5. The fish swim to the surface when food is held over the water.
6. Some fish have wide tail fins.

Which observations are about inherited traits?

- F** Observations 1, 3, and 6
- G** Observations 1, 2, and 4
- H** Observations 2, 3, and 5
- J** Observations 2, 5, and 6













**STAAR  
GRADE 5  
Science  
May 2019**

