

**GRADE 5**  
**Science**

**Administered May 2016**

**RELEASED**



# SCIENCE

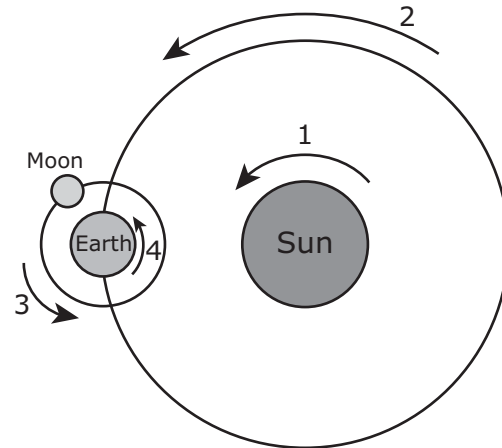
## DIRECTIONS

Read each question carefully. For a multiple-choice question, determine the best answer to the question from the four answer choices provided. For a griddable question, determine the best answer to the question. Then fill in the answer on your answer document.

- 1 Two wires carrying electricity can create a spark if they come too close together. This spark can start a fire. Wires carrying electricity are usually covered with plastic to keep them from starting a fire. Why does the plastic keep the electricity from starting a fire?
- A Plastic is a good insulator.
  - B Plastic can melt when heated.
  - C Plastic is softer than wire.
  - D Plastic conducts electricity.

2 A student draws a model showing the movements of Earth, the moon, and the sun.

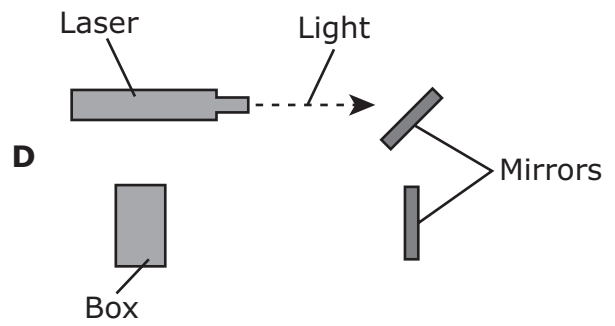
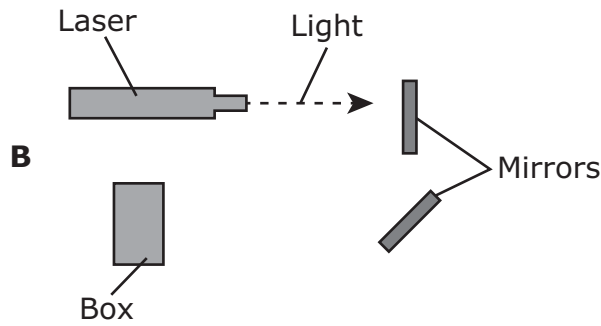
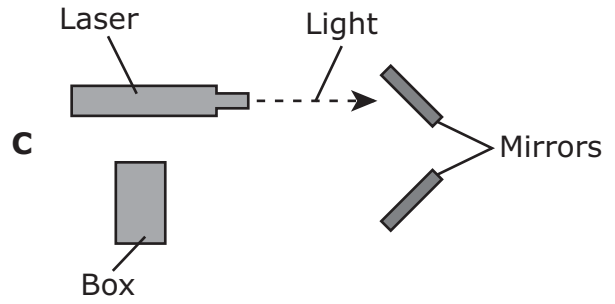
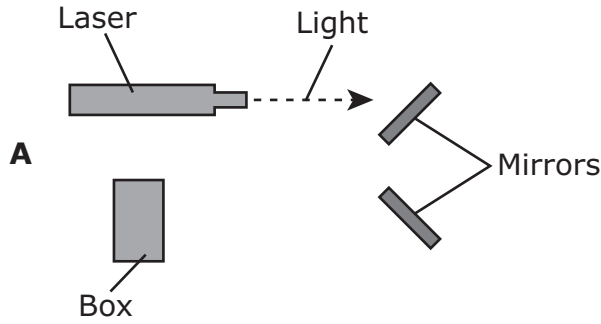
Movements of Earth, the Moon, and the Sun



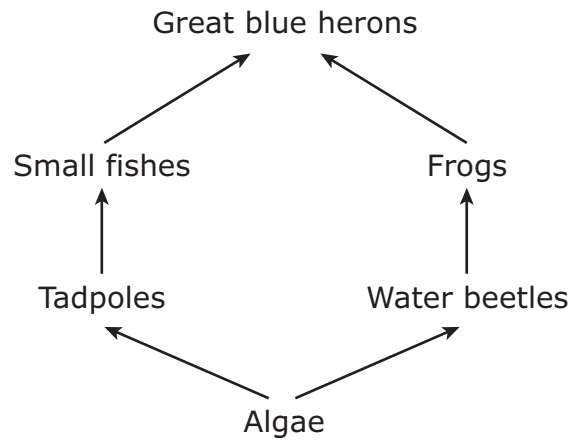
Which arrow shows the movement that causes day and night on Earth?

- F** Arrow 1, because it shows the rotation of the sun
- G** Arrow 2, because it shows the orbit of Earth around the sun
- H** Arrow 3, because it shows the orbit of the moon around Earth
- J** Arrow 4, because it shows the rotation of Earth

3 Lasers produce a beam of light that can be focused on a small area. A teacher uses two mirrors to shine a beam of light from a laser onto a box. Which diagram shows how the teacher should position the two mirrors?



4 A partial food web of a pond ecosystem is shown below.



Which type of organism is missing from this food web?

- F** Decomposers
- G** Producers
- H** Predators
- J** Consumers

5 Which list best describes a landslide?

**A**

- Can occur after heavy rain
- Can take less than 1 minute to occur
- Causes lava to flow
- Increases the temperature of nearby land
- Causes ocean waves to increase in size

**C**

- Causes nearby air to move fast
- Increases the temperature of the air
- Causes rivers to flow faster
- Produces cracks in the ground
- Usually caused by volcanoes on the ocean floor

**B**

- Causes large amounts of soil to move at once
- Usually happens rapidly
- Can be caused by earthquakes or volcanoes
- Can change the direction of creeks and streams

**D**

- Can cause tornadoes to form
- Removes soil from hillsides
- Occurs near volcanic eruptions
- Changes the shape of rivers



- 6 For a science assignment a student was asked to observe some organisms and then make a table to classify the organisms' traits as inherited or learned. The student's table is shown below.

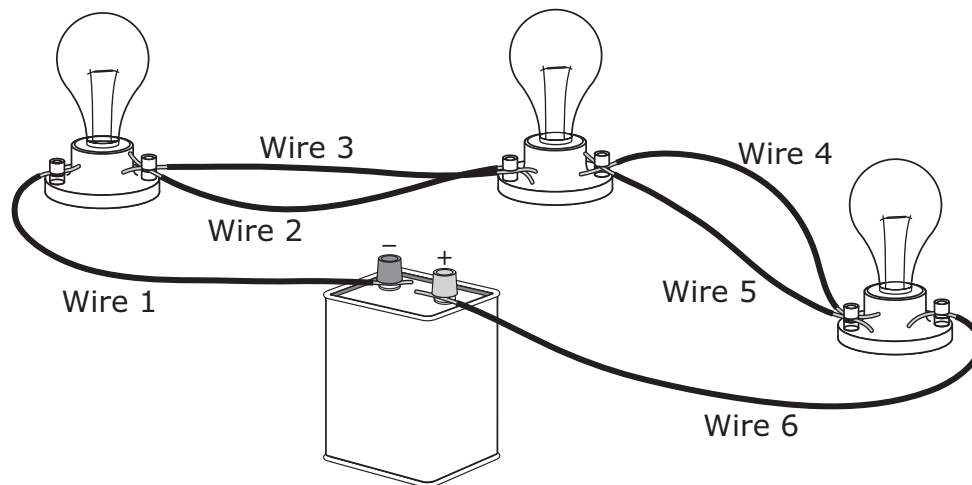
Observations of Some Organisms

Trait	Inherited or Learned?
Colt able to walk right after birth	
Student texting a message	
Spider spinning a web	
Brown fur on a bear	
Child using a fork to eat	
Woman driving a car	
Green leaves on a tree	
Lion jumping through a hoop	

How many of these observations describe learned behaviors and how many describe inherited traits?

- F 1 learned behavior, 7 inherited traits
- G 2 learned behaviors, 6 inherited traits
- H 3 learned behaviors, 5 inherited traits
- J 4 learned behaviors, 4 inherited traits

7 All the lightbulbs in this circuit are lit.



Which change would cause all the bulbs to go out?

- A Removing Wire 1
- B Removing Wires 2 and 4
- C Removing Wires 2 and 5
- D Removing Wires 3 and 4

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8 Erosion is one of the processes involved in the formation of sedimentary rock. Which of these best describes the process of erosion?

- F Rocks are broken into smaller pieces that remain in the same location.
- G Pressure compacts layers of sediment and turns them into rock.
- H Pieces of rock or soil are carried from one place to another.
- J Sediment grains fall to the bottom of a lake to form sedimentary layers.

- 9 A student conducts an investigation using caramel candy, paper plates, and a stopwatch. The student places a piece of the caramel candy on each of three plates. The student puts the plates in different locations around the school. The student will record the time it takes for each piece of caramel candy to change state and other observations in the table below.

Data from Candy Investigation

Location of Candy	Time It Takes Candy to Change State (minutes)	Observations
In the shade under a tree		
On a table in the sunlight		
In a classroom		

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

- A In which location does the caramel candy change state the fastest?
- B What causes the caramel candy to keep its shape?
- C Why does the caramel candy change state?
- D At what temperature does the caramel candy melt?

**10** A student observing birds in a park records some ways that birds interact with living and nonliving parts of their environment. All the following observations are ways that a bird interacts with nonliving parts of its environment **except** —

- F** reacting to morning sunlight by singing
- G** drinking and taking a bath in a puddle of water
- H** responding to cold temperatures by fluffing its feathers
- J** feeding insects to its chicks

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**11** A student made a list of activities that involve energy.

- |  |
|--|
| <ol style="list-style-type: none"><li>1. Sharks chasing a school of fish</li><li>2. A toaster heating bread</li><li>3. A cell phone charging</li><li>4. A tree limb falling to the ground</li><li>5. Tomato plants absorbing sunlight</li><li>6. A canoe floating down a river</li></ol> |
|--|

Which activities on the list are examples of the use of mechanical energy?

- A** Activities 1, 4, and 6
- B** Activities 2, 4, and 5
- C** Activities 1 and 2
- D** Activities 3, 5, and 6

- 12** A student combined powdered paint with water to make a small amount of a blue liquid paint mixture. The student left the paint mixture in an open container. Several days later the student found the container and observed that changes had occurred. What most likely happened to the mixture?
- F** The container was empty after the mixture evaporated into the air.
  - G** The paint evaporated, leaving only clear water in the container.
  - H** The water evaporated, leaving only a dry blue solid in the container.
  - J** The liquid paint mixture was lighter in color after some water evaporated.

**13** The shells of sea turtles are flatter than the shells of land turtles.



Sea turtle



Land turtle

Sea turtles are also different from land turtles because sea turtles cannot pull their head or limbs into their shell to protect themselves from predators. Instead, the head, shell shape, and flippers of sea turtles help them escape from predators mainly by allowing them to —

- A** dig deep holes for their eggs
- B** swim and dive easily
- C** blend into their surroundings
- D** hold their breath for several minutes

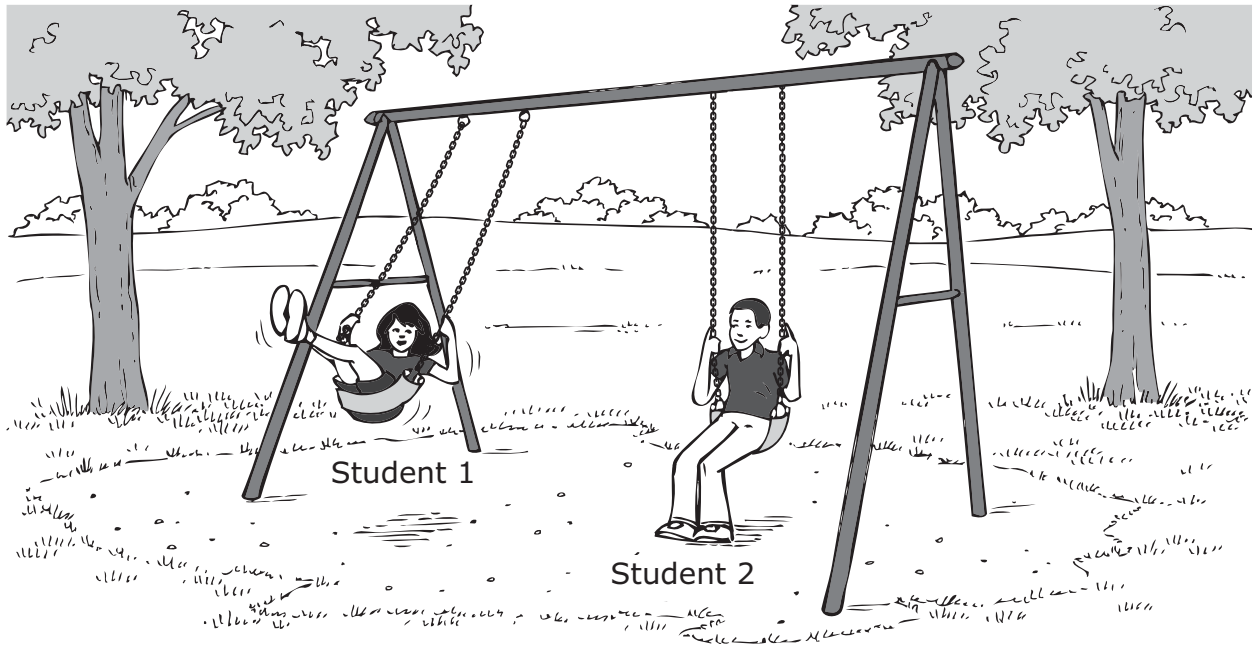
- 14** Citizens in a community were surveyed about the type of energy resource they would like for a new power plant. The results of the survey are shown in the table.

Energy Resource	Number of Citizens
Wind turbines placed along the coast	257
Coal mined in another state	51
Solar panels in fields outside the city	112
Wind turbines placed on hills outside the city	116
Natural gas from natural gas wells in the state	314

How many citizens chose alternative energy resources?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

- 15** Two students are playing on a swing set. Student 1 is leaning back and extending her legs as she moves upward. Student 2 is sitting on the swing with his feet on the ground.



Which statement describes how position and work are related in this picture?

- A** Both students are doing work even if only one student is changing position.
- B** Student 1 is changing position because work is being done on the swing.
- C** Work done by Earth's gravity prevents Student 2 from changing position.
- D** Work is being done on both students by the swings because one swing is changing position.



**16** Tropical climates have warm temperatures and abundant sunlight all year. What must be available for plants in these climates to make their own food throughout the year?

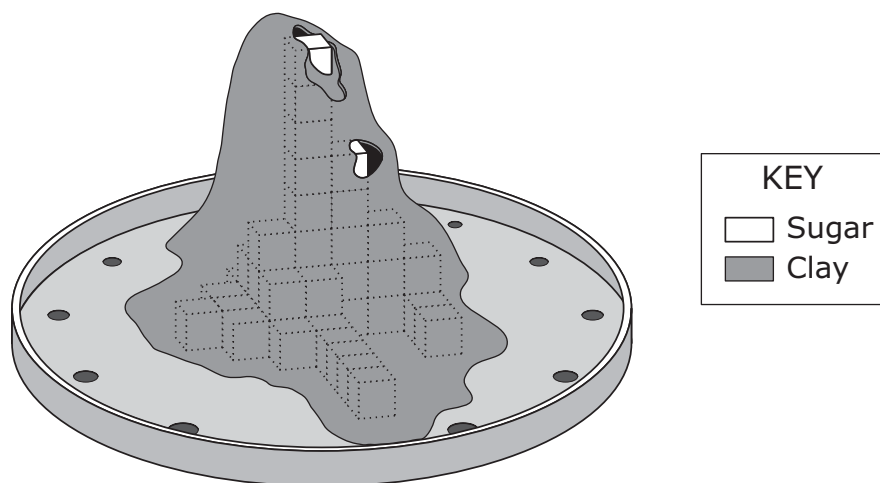
**F** Bacteria

**G** Birds

**H** Shade

**J** Water

- 17** Students constructed this model of a hill by covering sugar cubes with clay. The students placed the model in a large pan and poured hot water over it every day for a week.



What does the model best represent?

- A** A method for removing fossil fuels from hills
- B** The formation of caves in hills
- C** The formation of plains
- D** A method for separating minerals

**18** A student puts four objects in a bucket filled with water. The objects are listed below.

- Plastic ball
- Glass marble
- Metal paper clip
- Wood block

Which two objects are most likely less dense than the water?

- F** Wood block and metal paper clip
- G** Plastic ball and glass marble
- H** Metal paper clip and glass marble
- J** Wood block and plastic ball

- 19** Some students are investigating the life cycle of the spotted salamander. They learn that these salamanders must live close to water and lay their eggs in water. After 20–60 days the eggs hatch as larvae that must stay in the water until they mature into adult salamanders. The students infer that the life cycle of the spotted salamander is similar to the life cycle of the frog because both animals —
- A** have long tails and strong jumping legs as adults
  - B** live near water and produce larvae with wings
  - C** lay eggs in water, which hatch into larvae that live in water
  - D** produce offspring that hatch from eggs and look like adults
- 

- 20** Which of these is a renewable resource?
- F** Gasoline that contains some alcohol
  - G** Wind produced by the uneven heating of Earth’s surface
  - H** Natural gas pumped from deep underground
  - J** None of these

- 21** In parts of the East Texas Piney Woods ecosystem, there are forests with many tall pine trees. These thick forests have few other types of tall trees besides pine trees. The other plants growing in the ecosystem are usually small shrubs, grasses, and other short trees. A student wants to know what type of birds live in the Piney Woods region. The student reads the table shown below about four different birds.

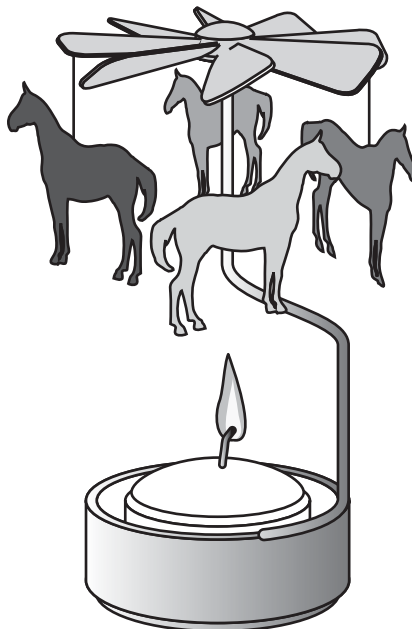
Some Characteristics of Four Texas Bird Species

Bird	Characteristics
Burrowing owl	<ul style="list-style-type: none"><li>• Builds its nests in holes underground in open areas with no trees</li><li>• Eats insects, scorpions, and small animals</li></ul>
Roseate spoonbill	<ul style="list-style-type: none"><li>• Builds its nests in thick plants growing above bodies of water</li><li>• Eats small fish and shrimp</li></ul>
Red-cockaded woodpecker	<ul style="list-style-type: none"><li>• Builds its nests in holes dug in old, live trees</li><li>• Often found nesting in family groups in many trees growing near one another</li><li>• Eats sap from trees and insects found under tree bark</li></ul>
Golden-cheeked warbler	<ul style="list-style-type: none"><li>• Builds its nests in oak and juniper trees in canyons</li><li>• Nests are made of juniper bark and spiderwebs</li><li>• Eats insects and spiders found on the leaves of oaks and other trees</li></ul>

Based on the table, which bird is most likely to live in Texas's Piney Woods region?

- A** Burrowing owl
- B** Roseate spoonbill
- C** Red-cockaded woodpecker
- D** Golden-cheeked warbler

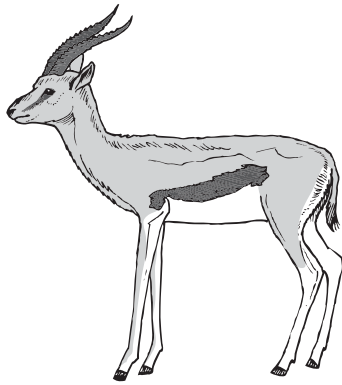
- 22** An old-fashioned metal toy is shown below. When the candle is lit, the carousel of horses begins to turn.



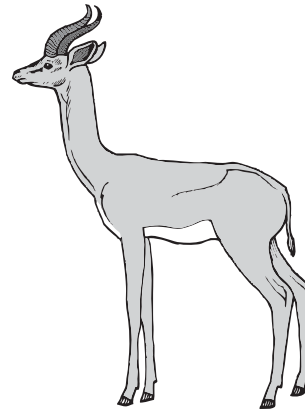
Which of these correctly describes the energy that makes the carousel turn?

- F** Heat from the candle produces currents of warm air.
- G** Heat from the candle produces electrical energy.
- H** Light from the candle produces mechanical energy.
- J** Light from the candle produces wind currents.

- 23** Many types of grazing animals live in Africa. The pictures show two of these animals that have about the same mass and height at the shoulder.



Thomson's gazelle

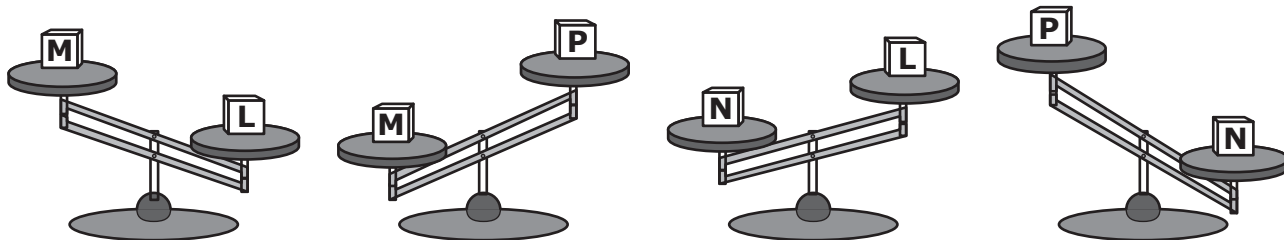


Gerenuk

Based on observations of the pictures of these animals, which statement describes an advantage that only one of these animals has in obtaining food?

- A** The Thomson's gazelle has a body shape that allows it to run faster when chasing prey.
- B** The Thomson's gazelle has horns that can be used to move tree branches out of the way to reach food.
- C** The gerenuk has a sharp, pointed nose for detecting the scent of predators.
- D** The gerenuk has a long neck that allows it to reach high to eat from trees.

- 24** A student was asked to compare the masses of four blocks that were all the same size but made of different materials. The student used a balance to compare the masses of two blocks at a time. The student repeated this process three more times with different pairs of blocks and recorded observations.

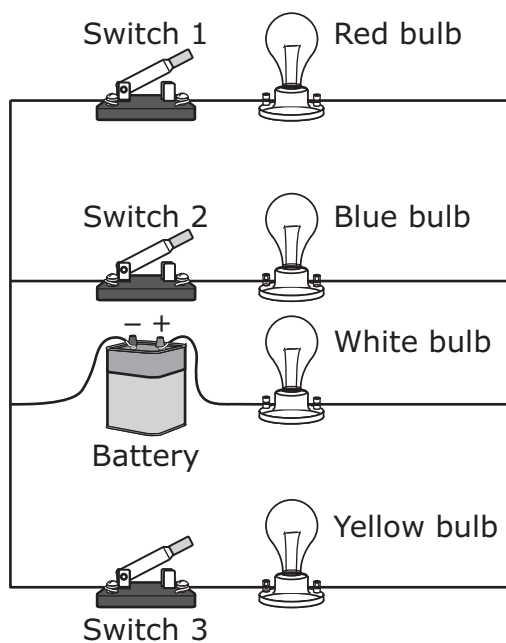


Which list shows the blocks in order from least to greatest mass?

- F** Blocks N, M, L, P
- G** Blocks P, M, L, N
- H** Blocks N, L, M, P
- J** Blocks P, L, M, N



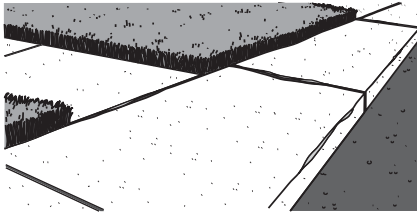
25 Students constructed a circuit using different-colored lightbulbs.



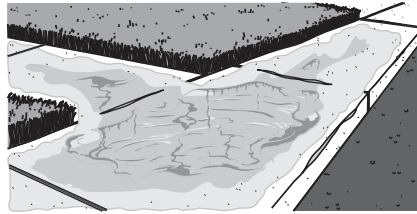
What will happen if Switch 3 is closed and the other switches are left open?

- A Only the white bulb will operate.
- B None of the bulbs will operate.
- C Only the white and yellow bulbs will operate.
- D Only the red and blue bulbs will operate.

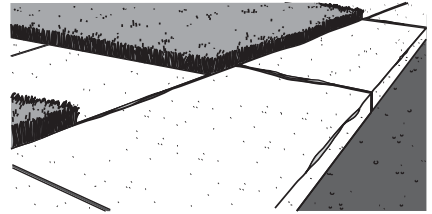
26 The pictures show a sidewalk at three different times on the same day. The changes were caused by the weather.



Dry sidewalk  
6:00 A.M.



Wet sidewalk  
7:00 A.M.



Dry sidewalk  
Noon

Which table best describes the changes that most likely occurred between 6:00 A.M. and noon?

**F**

6:00 A.M.– 7:00 A.M.	7:00 A.M.– Noon
Precipitation and runoff	Condensation and evaporation

**G**

6:00 A.M.– 7:00 A.M.	7:00 A.M.– Noon
Condensation and precipitation	Runoff

**H**

6:00 A.M.– 7:00 A.M.	7:00 A.M.– Noon
Precipitation	Condensation and runoff

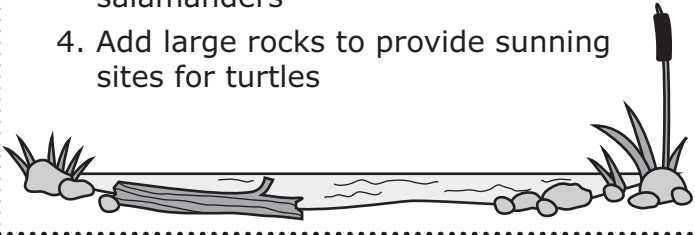
**J**

6:00 A.M.– 7:00 A.M.	7:00 A.M.– Noon
Precipitation and runoff	Evaporation

- 27** A farmer is reading a nature guide to learn how to make changes to a pond so that it will attract and support wildlife. The guide gives the suggestions listed below.

**Help Your Pond Support Wildlife**

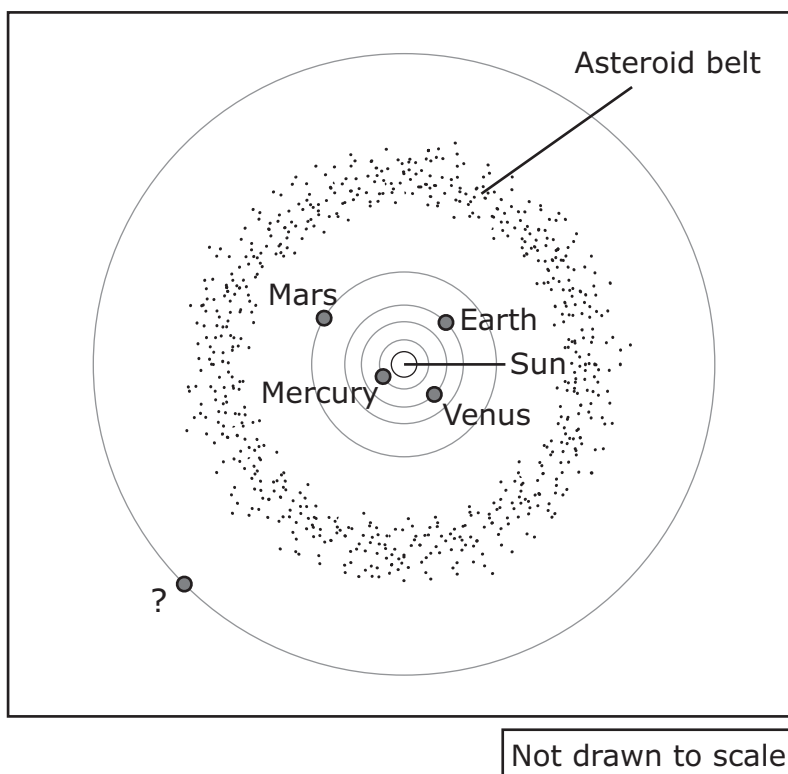
1. Reduce soil erosion by keeping livestock away from the banks of the pond
2. Allow plants to grow along the shoreline to provide cover, nests, and food for wildlife
3. Float logs near the edge of the water to provide habitats for salamanders
4. Add large rocks to provide sunning sites for turtles

A simple line drawing of a pond. In the center, a log floats horizontally. The banks are lined with several rocks of varying sizes. On the left bank, there is a small tuft of grass. On the right bank, there is a taller plant with long, thin leaves and a single dark stem.

Which suggestion involves interactions between two groups of living organisms?

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

**28** Asteroids are large bodies of rock that are too small to be planets. An asteroid belt has many asteroids. The diagram shows the asteroid belt located between Mars and the first outer planet.



Which outer planet is closest to this asteroid belt?

- F** Uranus
- G** Neptune
- H** Saturn
- J** Jupiter

29 The table lists some properties of four different samples of matter.

Sample	State of Matter at Room Temperature	Color	Attracted to Magnet?	Conducts Electricity?
1	Solid	Clear	No	No
2	Solid	Silver	Yes	Yes
3	Liquid	Clear	No	Yes
4	Liquid	White	No	Yes

Which two samples could be glass and saltwater?

- A Samples 1 and 2
- B Samples 3 and 4
- C Samples 1 and 3
- D Samples 2 and 3

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30 Some traits of living organisms are inherited, while some behaviors must be learned. Which statement related to inherited traits or learned behaviors is **not** correct?

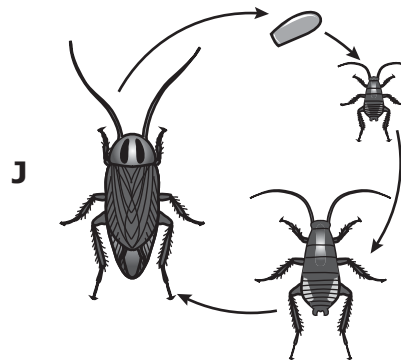
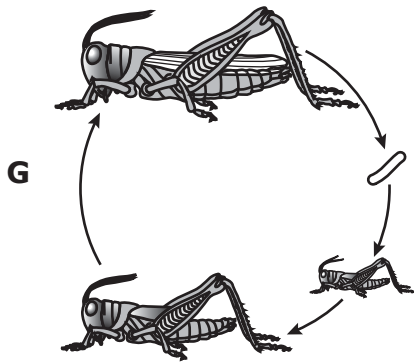
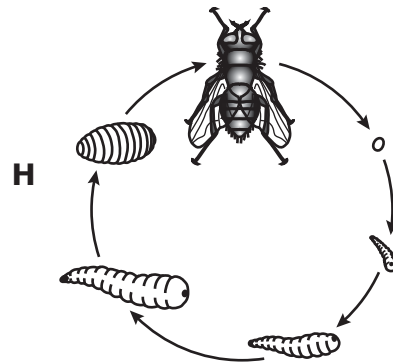
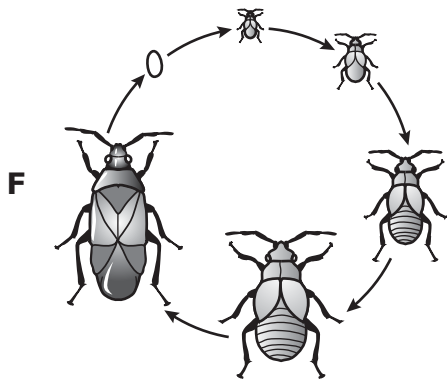
- F The ability of a figure skater to spin on ice is related to both inherited traits and learned behaviors.
- G The ability of lions to use camouflage to hide in grassy fields is an inherited trait only.
- H The number and type of legs a cricket has is an inherited trait only.
- J The behavior of a dog guiding a blind person on a walk through a neighborhood is an inherited trait only.

**31** Most alternative energy resources produce more energy at certain times. Which combination can produce a steady flow of energy from only alternative resources 24 hours a day year-round?

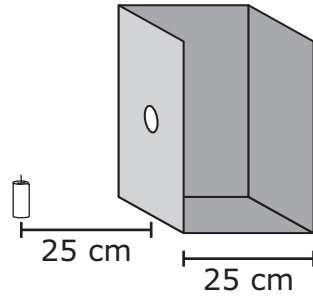
- A** Geothermal and natural gas
- B** Hydroelectric and geothermal
- C** Solar and petroleum
- D** Wind and coal

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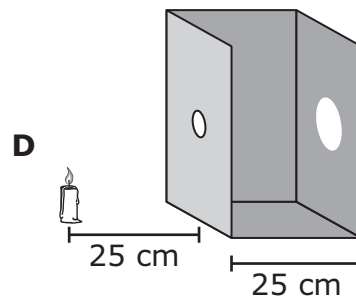
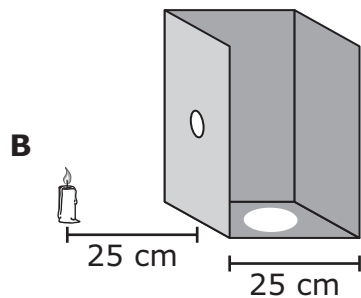
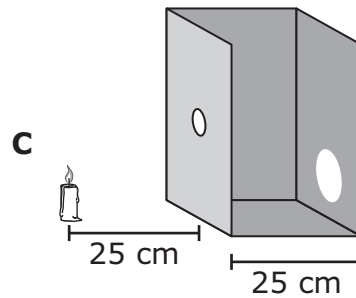
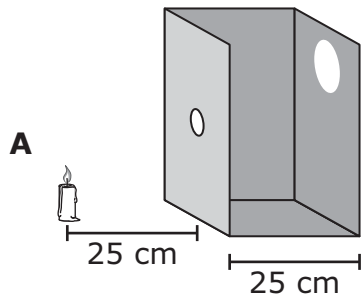
**32** The diagrams below represent the life cycles of four different insects. Which of these insects goes through a complete metamorphosis?



**33** A teacher takes the top and a side off a box. She cuts a hole in another side and puts a candle outside the box, as shown below.



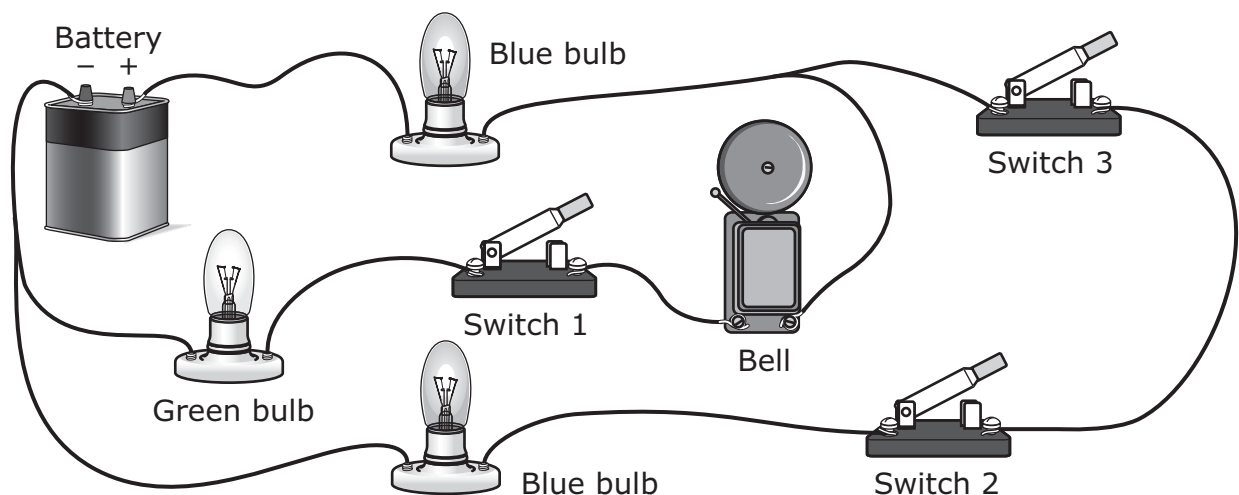
When the teacher lights the candle in a dark room, some of the candlelight shines through the hole. Which diagram best shows how the light appears on the opposite wall of the box?



- 34** What would most likely happen to the carbon dioxide–oxygen cycle if Earth’s large forests were all cut down?
- F** There would be more carbon dioxide in the atmosphere because fewer plants would be using it to produce their own food.
  - G** The remaining plants would stop producing carbon dioxide, and animals would use less oxygen.
  - H** The remaining plants would produce more oxygen, and animals would produce less carbon dioxide.
  - J** There would be more oxygen in the atmosphere because fewer plants would be using it to produce their own food.



35 This circuit has three lightbulbs and a bell.



Which procedure will result in only the blue lightbulbs operating?

- A Close Switches 1 and 2 and leave Switch 3 open
- B Close Switch 3 and leave Switches 1 and 2 open
- C Close Switches 2 and 3 and leave Switch 1 open
- D Close Switch 2 and leave Switches 1 and 3 open

- 36** A teacher asks six students to design and build solar ovens that could be used to boil water. After the ovens are complete, the students record the maximum temperatures that can be reached inside their ovens in 1 hour.

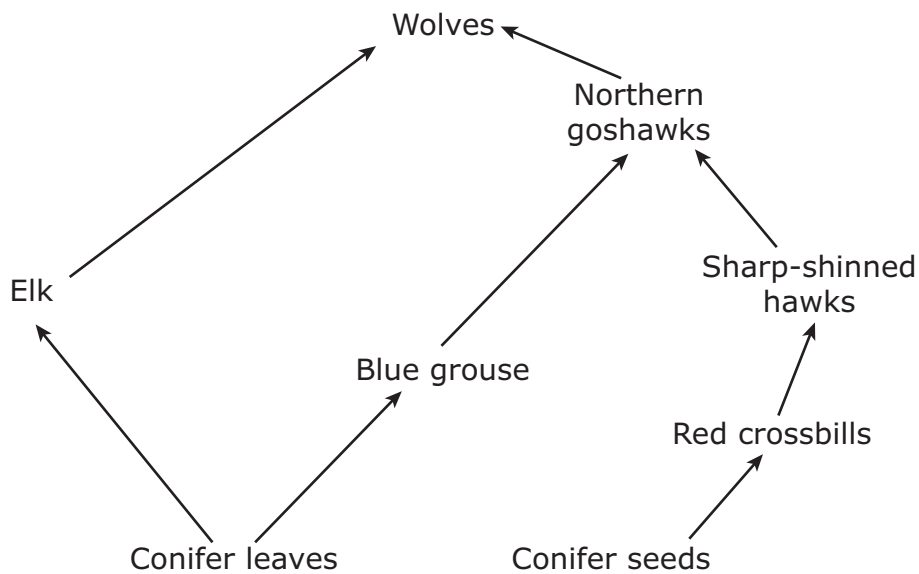
Solar-Oven Data

Oven	Maximum Temperature Reached (°C)
1	79
2	130
3	65
4	101
5	88
6	86

Which list identifies all the ovens that must be redesigned in order to reach temperatures that will boil water in 1 hour?

- F** Ovens 1, 3, 4, 5, and 6
- G** Ovens 1, 3, 5, and 6
- H** Ovens 1, 3, and 6 only
- J** Ovens 1 and 3 only

37 A partial forest food web is shown.



In this food web, energy is transferred directly between —

- A conifer seeds and red crossbills
- B conifer leaves and northern goshawks
- C blue grouse and wolves
- D elk and sharp-shinned hawks

**38** This photograph shows a beach on a partly sunny day.

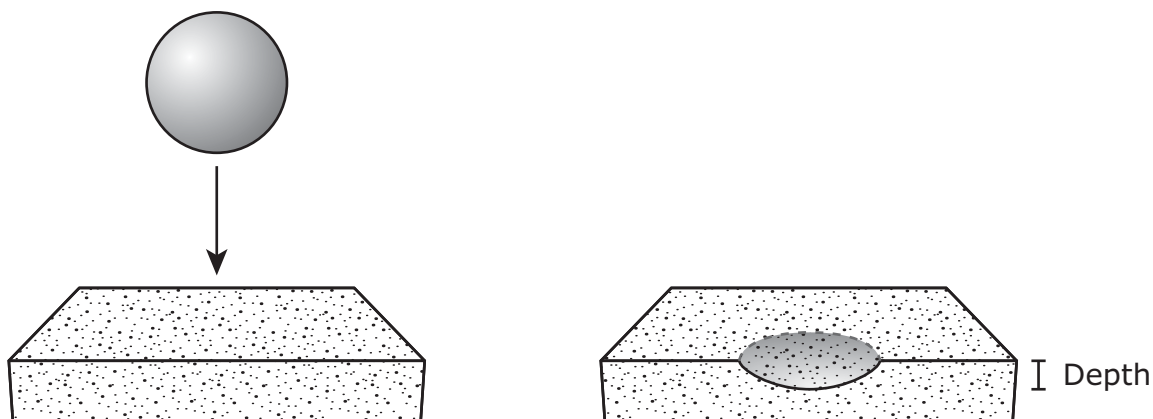


© Paul Hakimata/Dreamstime.com

Which of the following is an interaction between the sun and the ocean that results in clouds forming near the beach?

- F** Energy from the sun causes precipitation over the ocean.
- G** Energy from the sun causes water to evaporate from the ocean.
- H** Light from the sun reflects off the surface of the ocean.
- J** Light from the sun decreases the amount of water vapor in the air over the ocean.

- 39 Students drop the same heavy ball onto identical blocks of soft clay from different heights. For each height they measure the depth of the dent the ball makes in the clay.

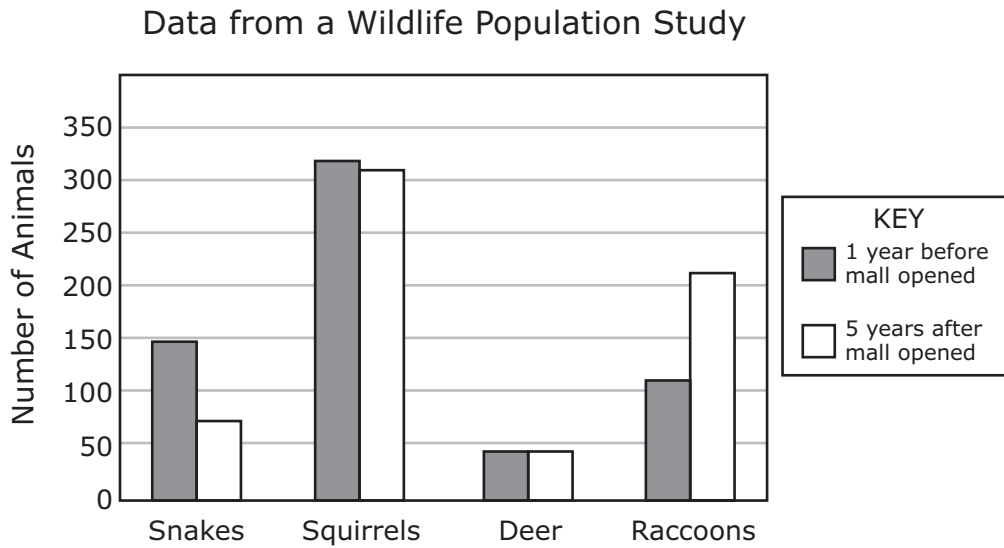


Why is the depth of the dent different in each trial?

- A The size of the ball changes.
  - B The material of the ball changes.
  - C The mass of the ball when it hits the clay changes.
  - D The force of the ball when it hits the clay changes.
- 
- 40 Which of these is **not** soluble in water?

- F Oil
- G Salt
- H Honey
- J Sugar

- 41** Data for four animal populations in a wooded area were collected before and after a shopping mall was constructed near the area. The graph shows changes in the populations.



Which animal's food sources most likely increased after the mall opened?

- A** Snakes, squirrels, and raccoons
- B** Squirrels only
- C** Snakes, squirrels, and deer
- D** Raccoons only

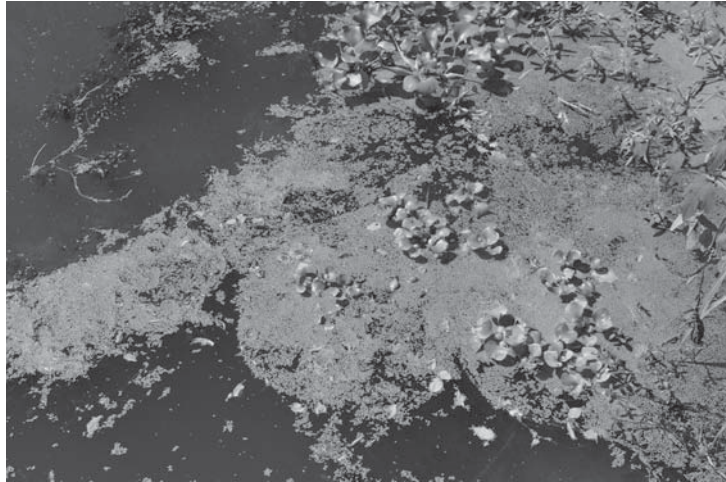
**42** Some scientists measured and recorded local rainfall amounts and water levels at several local lakes over the summer. They compared their measurements with data from the past 30 years. The scientists concluded that the area was drier this summer than in previous years. They plan to continue recording these measurements each summer for the next decade. What characteristic of the area are the scientists studying?

- F** Climate, because they are making more than one type of measurement
  - G** Climate, because they are comparing rainfall amounts over a long period of time
  - H** Weather, because they are tracking changes only to their local environment
  - J** Weather, because they expect rainfall amounts and water levels to continue to decrease
- 

**43** A student uses a set of headphones to listen to music. Which of these objects uses the same source of energy as the headphones?

- A** A flute using wind energy
- B** A piano using mechanical energy
- C** A keyboard using electrical energy
- D** A teapot using thermal energy

**44** This photograph shows plants growing on the surface of a pond.



How do plants like these form fossil fuels?

- F** The dead plants sink to the bottom of the pond and get buried by sediment for millions of years.
- G** The dead plants get buried for millions of years and form fossils that attract carbon.
- H** The dead plants sink to the bottom of the pond and are consumed by decomposers.
- J** The dead plants produce carbon that is consumed by fish, which form fossils.



**STAAR  
GRADE 5  
Science  
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