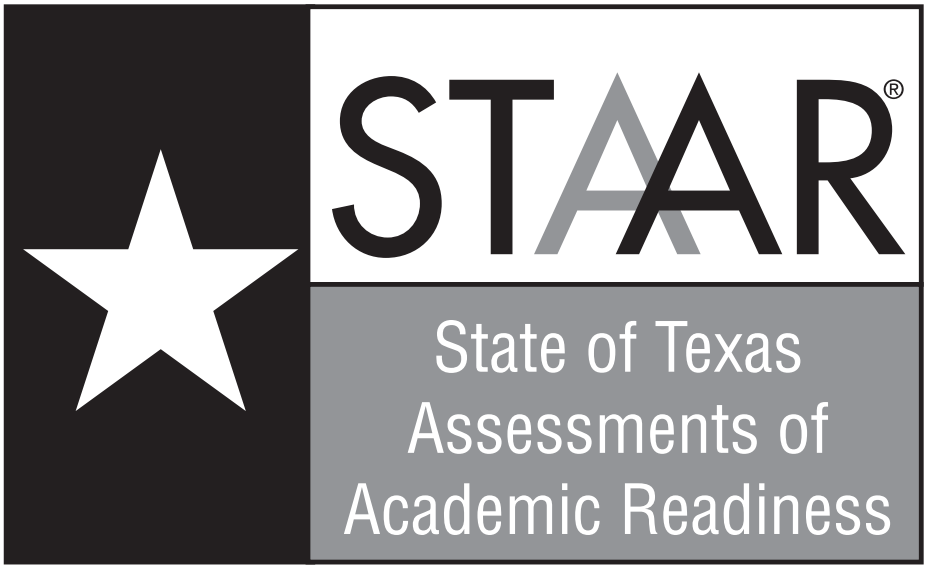


GRADE 5

Science

Administered April 2015

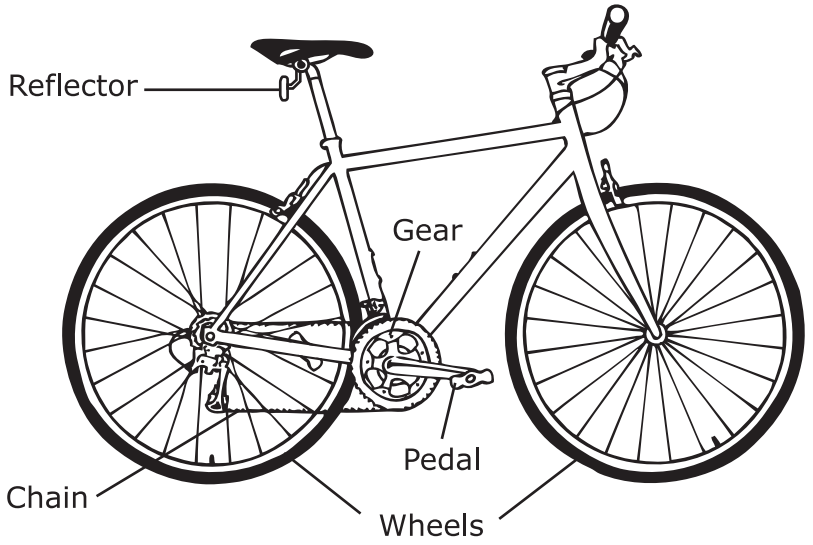
RELEASED

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 Many people ride a bicycle for fun and exercise. Some people ride a bicycle to work because it saves money and benefits the environment by reducing the use of fossil fuels.



Which of these is **not** an example of the bicycle using mechanical energy?

A The pedals, gears, and chain help turn the wheels.

B The wheels turn when the bicycle moves.

C The front wheel guides the bicycle as it moves.

D The reflector allows the bicycle to be seen at night.

GO ON

2 A teacher gives a student four clear sealed containers. Each container holds a different substance. The student records some observations about the substance in each container.

Student Observations

Container	Observations
1	The substance takes the shape of the container and is clear. Small particles float on top of the substance.
2	The substance is hard and cube-shaped. The surface of the substance is shiny.
3	The substance is not visible, and the container appears empty.
4	The substance is cold and made of crystals.

Based on these observations, which container most likely holds only gas?

F Container 1

G Container 2

H Container 3

J Container 4

GO ON

3 A farmer keeps bees to pollinate crops. The farmer makes several observations about the bees.

- Bees make return trips to drink sugar water from a bowl placed 40 meters from their hive.
- Bees have dark eyes and black-and-yellow stripes.
- Bees produce honey from the nectar they collect.
- Bees will sting when threatened or disturbed.

Which of these observations describes a learned behavior?

A Bees make return trips to drink sugar water from a bowl placed 40 meters from their hive.

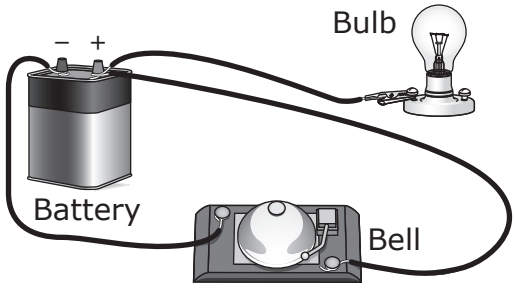
B Bees have dark eyes and black-and-yellow stripes.

C Bees produce honey from the nectar they collect.

D Bees will sting when threatened or disturbed.

GO ON

4 A group of students built the circuit shown below.



The lightbulb does not glow. Which statement explains this observation?

F The battery is not charged.

G The lightbulb is not part of a complete circuit.

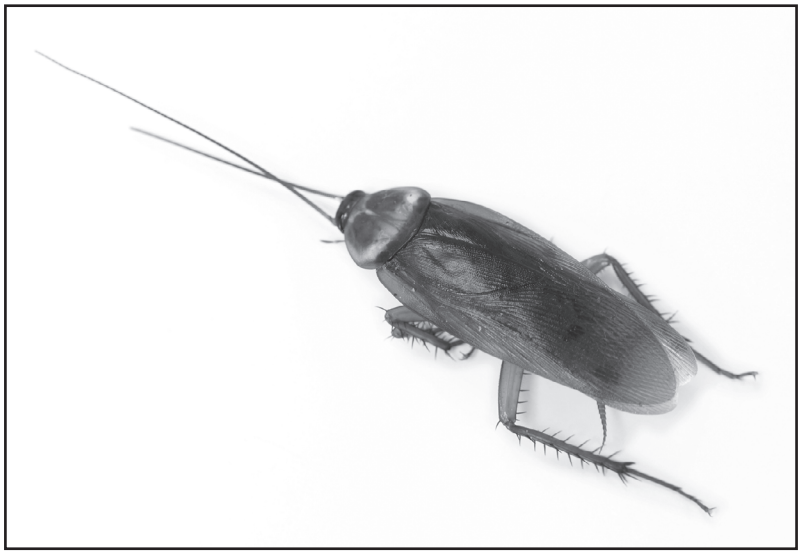
H The circuit does not have a switch.

J The bell uses most of the energy from the battery.

GO ON

5 The whiskers of a river otter and the antennae of a cockroach are shown below.

© photobypixie777/Fotolia



© R_R/Fotolia

How do structures such as whiskers and antennae benefit organisms?

A They help the organisms detect their surroundings.

B They help the organisms eat food quickly.

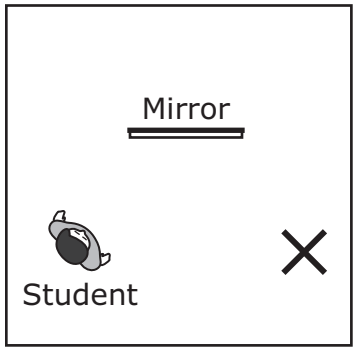
C They help the organisms fight predators.

D None of these

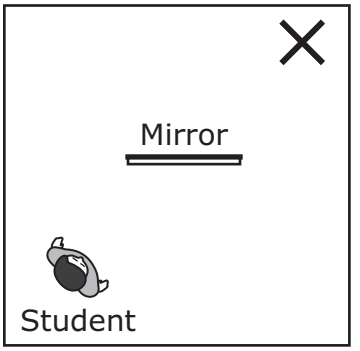
GO ON

6 A student looks into a mirror and sees an image of an object. Which diagram shows an X where the object is most likely located?

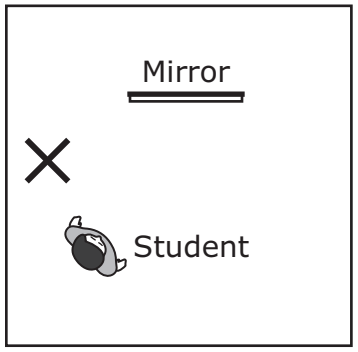
F



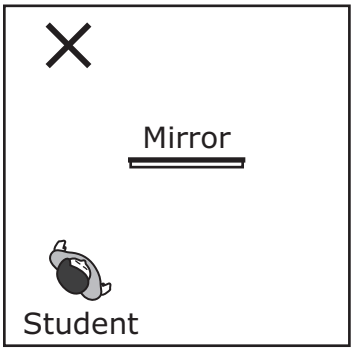
H



G



J



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7 An energy company wants to build a hydroelectric power plant. Which of these characteristics of an area is most important to the development of a hydroelectric power plant?

A The area has a cool, rainy climate.

B The area is located in a valley with very little wind and frequent heavy fog.

C The area has a river that flows rapidly from nearby mountains through a valley.

D The area has no geysers or hot springs.

GO ON

8 Some students investigate the properties of four objects using a hand lens, a magnet, and a beaker containing water. Their observations are recorded in the table.

Observed Properties

Object	Mass (g)	Observations
Cork	2	• Light brown • Has small holes • Floats in water
Marble	2	• Blue • Shiny • Sinks in water
Wood cube	2	• Light brown • Not attracted by a magnet • Floats in water
Rubber stopper	2	• Black • Sinks in water • Not attracted by a magnet

Which statement identifies a property that could be used to classify these objects into two different groups?

F Density can be used to separate objects that sink in water from objects that do not.

G Magnetism can be used to separate objects that are attracted by a magnet from objects that are not.

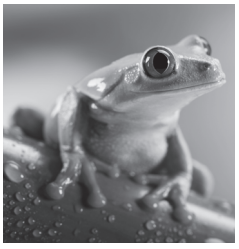
H Solubility can be used to separate objects that dissolve in water from objects that do not.

J Physical state can be used to separate objects that are solids from objects that are not.

GO ON

9 An African savanna is a grassland with shrubs and a few small trees. It has warm temperatures all year long, a dry winter season, and a rainy summer season. Which group of animals is most likely supported by an African savanna?

A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B


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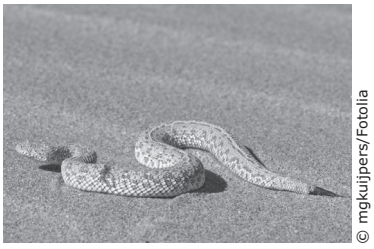
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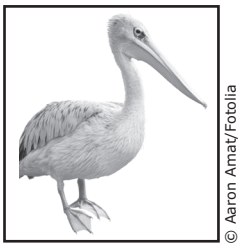
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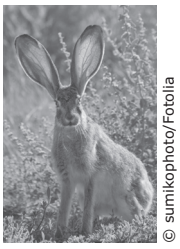
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C


© Dave/Fotolia


© Konrad Reszka/Fotolia


© sandpiper/Fotolia


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D


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GO ON

10 Some characteristics of objects in the solar system are listed below.

Characteristics of Some Objects in the Solar System

- The core temperature is 15 million degrees Celsius.
- Meteor craters can be found on the surface.
- The source of light is the sun.
- Water covers most of the surface.
- Rocks and dust can be found on the surface.

Which of the listed characteristics describe both Earth and the moon?

F
- The core temperature is 15 million degrees Celsius.
- Meteor craters can be found on the surface.
- Water covers most of the surface.
- Rocks and dust can be found on the surface.

G
- Meteor craters can be found on the surface.
- The source of light is the sun.
- Rocks and dust can be found on the surface.

H
- The core temperature is 15 million degrees Celsius.
- Water covers most of the surface.
- Rocks and dust can be found on the surface.

J
- Meteor craters can be found on the surface.
- The source of light is the sun.
- Water covers most of the surface.
- Rocks and dust can be found on the surface.

GO ON

11 The table below lists ways that four organisms obtain energy.

Methods for Obtaining Energy

Organism	Method
Oak tree	Produces food through photosynthesis
Mushroom	Absorbs nutrients from decomposing plants and animals
Cottontail rabbit	Eats grasses, twigs, and bark
Mountain lion	Preys on deer, wild hogs, and rodents

Which organism obtains energy without depending on another organism?

A Oak tree

B Mushroom

C Cottontail rabbit

D Mountain lion

---

12 A student observed liquid wax dripping down the side of a burning candle. After putting out the candle's flame, the student left the room. Several hours later the student observed that there was no longer any liquid on the side of the candle. Which statement explains what most likely happened to the liquid wax?

F The heat given off by the flame caused the candle wax to evaporate.

G The liquid wax changed back into a solid as it cooled.

H The liquid wax condensed and was absorbed by the candle.

J None of the above

GO ON

13 Which statement best describes the relationship between humans and plants in the carbon dioxide–oxygen cycle?

A Humans depend on oxygen released into the air by plants, and plants depend on carbon dioxide that humans release into the air.

B Plants produce carbon dioxide as a product of photosynthesis and release it into the air to provide energy for humans.

C Plants depend primarily on energy supplied by oxygen for photosynthesis, a process which releases carbon dioxide needed by humans.

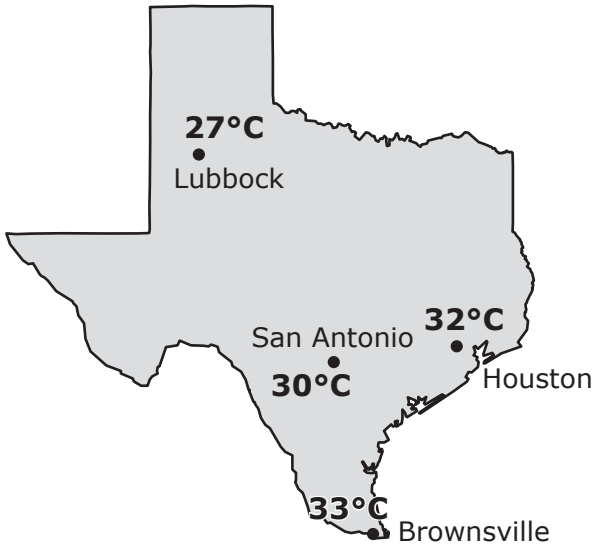
D Humans and plants use gases in the air and the energy of sunlight to produce their own food.

GO ON

14 A student studies two Texas maps that showed some high temperatures for two days in October 2012.

High Temperatures
on October 5, 2012

High Temperatures
on October 12, 2012



Source: *The Old Farmer's Almanac*

How many degrees Celsius did the high temperature increase in the city that had the greatest change in high temperature?

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

GO ON

15 A student adds 10 grams of four different powdered solids into four different beakers. The student then adds 100 mL of water to each beaker, stirs the mixtures, and allows them to sit for half an hour before recording observations. Which question is the student most likely trying to answer with this investigation?

A At what water temperature do the substances dissolve?

B How much water is needed to cause a substance to change state?

C What causes a substance to sink when put in water?

D Which substances dissolve in water?

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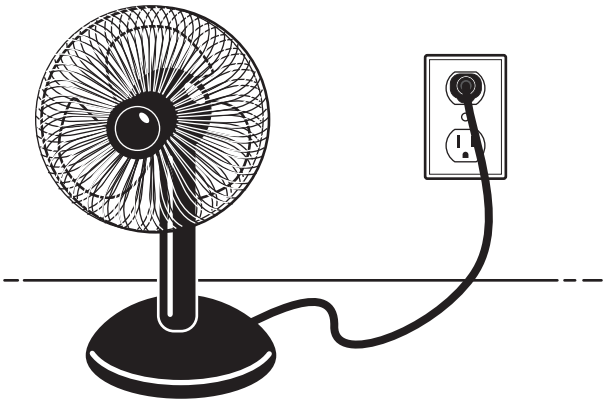
16 Many types of fans are used in homes. One type of electric fan is shown below.



In addition to mechanical energy, which of these is produced as electric current passes through the circuit of this fan?

F Heat

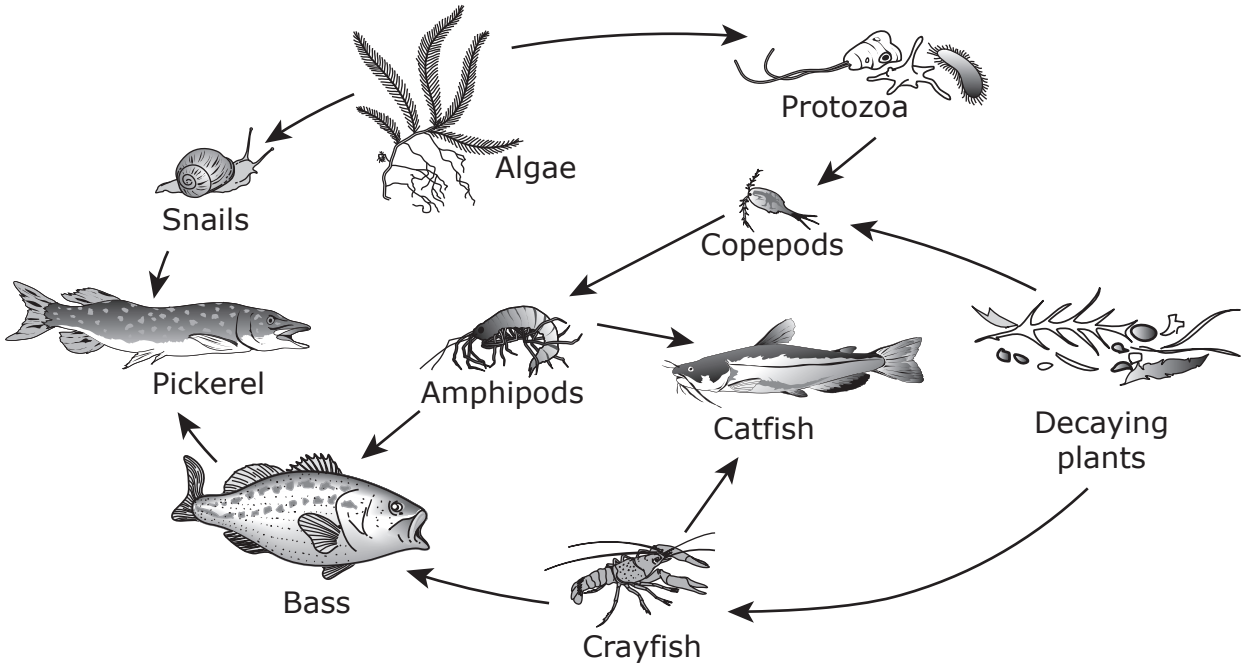
G Mass

H Light

J Water vapor

GO ON

17 A freshwater ecosystem has various food webs. One of these food webs is shown below.



Which organisms transfer the most energy within the food web?

A Bass, because they are predators in this web

B Copepods, because they support two chains in this web

C Crayfish, because they are at the bottom of this web

D Algae, because they are the producers in this web

GO ON

18 A student draws diagrams of her house and the location of the sun in the sky. Which diagram below does **not** correctly represent the location of the sun at the time indicated?

F

12:05 P.M.

H

8:45 A.M.

G

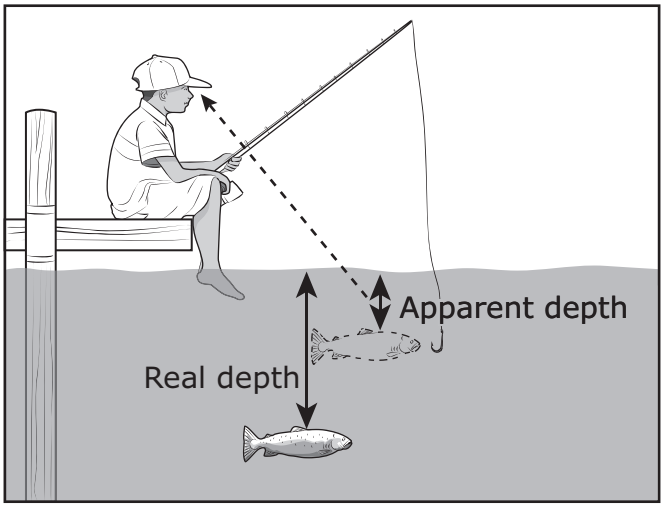
10:15 A.M.

J

7:00 P.M.

GO ON

19 The diagram below shows a fish being viewed from above the water.



The fish appears to be closer to the surface than it really is. What causes this difference?

A Light is reflected.

B Light is refracted.

C Light is focused.

D Light is blocked.

---

20 Fossil fuels formed over long periods of time after particles in water settled to the sea floor and formed marine mud. What kinds of particles needed to be present in the marine mud in order for fossil fuels to form?

F Mostly sand and a few small bits of wood

G Mostly decaying organisms

H Mostly lava and a few sedimentary rocks

J Mostly metal minerals

GO ON

21 The table below lists the preferred diet of several types of birds.

Preferred Diets of Birds

Type of Bird	Preferred Diet
American goldfinch	Seeds from grasses and wildflowers
Eastern bluebird	A large variety of insects
Lesser goldfinch	Seeds from sunflower plants
Purple martin	Winged insects
Yellow warbler	Caterpillars, moths, mosquitoes, and beetles

Based on this information, which two types of birds do **not** compete for food resources?

A Purple martin and yellow warbler

B Eastern bluebird and purple martin

C Lesser goldfinch and eastern bluebird

D American goldfinch and lesser goldfinch

GO ON

22 The photograph below shows a canyon in northern Arizona.

Canyon walls

Which of these describes how this canyon was most likely formed?

F Floods eroded the sandstone away from the canyon walls.

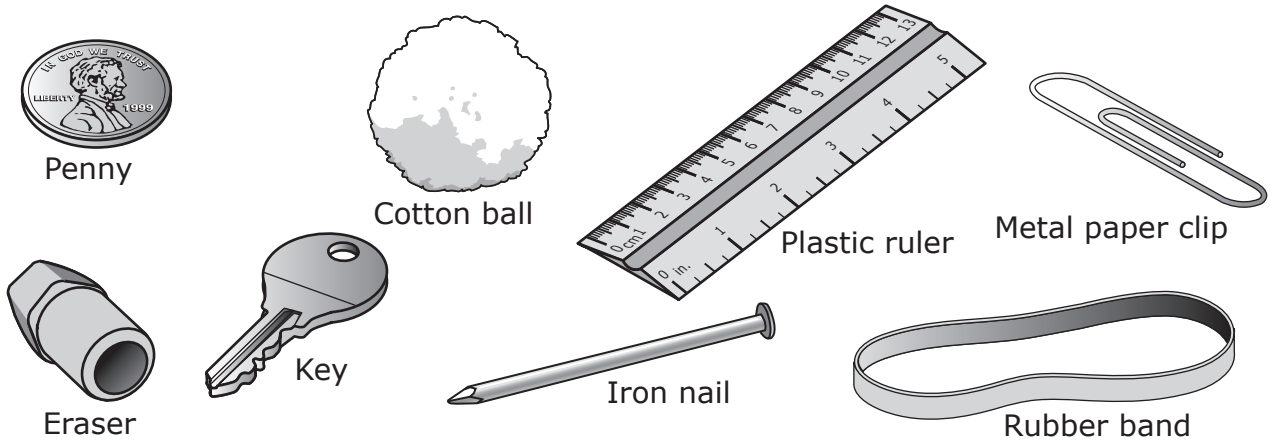
G Glaciers eroded the canyon rock as they melted and moved.

H Ice wedged into cracks in the rock and weathered the canyon walls.

J Wind blew large rocks that smashed against the canyon walls.

GO ON

23 A student classifies the objects shown based on their physical properties.



Which property **cannot** be used to classify these objects into more than one group?

A Magnetism

B Mass

C Electrical conductivity

D Solubility in water

GO ON

24 Some students examined two samples of pond water with a hand lens over three days. Each day they compared what they saw with pictures of samples their teacher had labeled. Their observations are listed below.

- On Day 1 the students identified mosquito eggs and mosquito larvae in one water sample and dragonfly nymphs in the other water sample.
- On Day 2 the students saw that the mosquito larvae had curled up and stopped moving.
- On Day 3 the students saw that a dragonfly with wings had developed from one of the nymphs.

Based on their observations, the students concluded that mosquitoes undergo complete metamorphosis while dragonflies undergo incomplete metamorphosis. Which of these explains why the students' conclusion is correct?

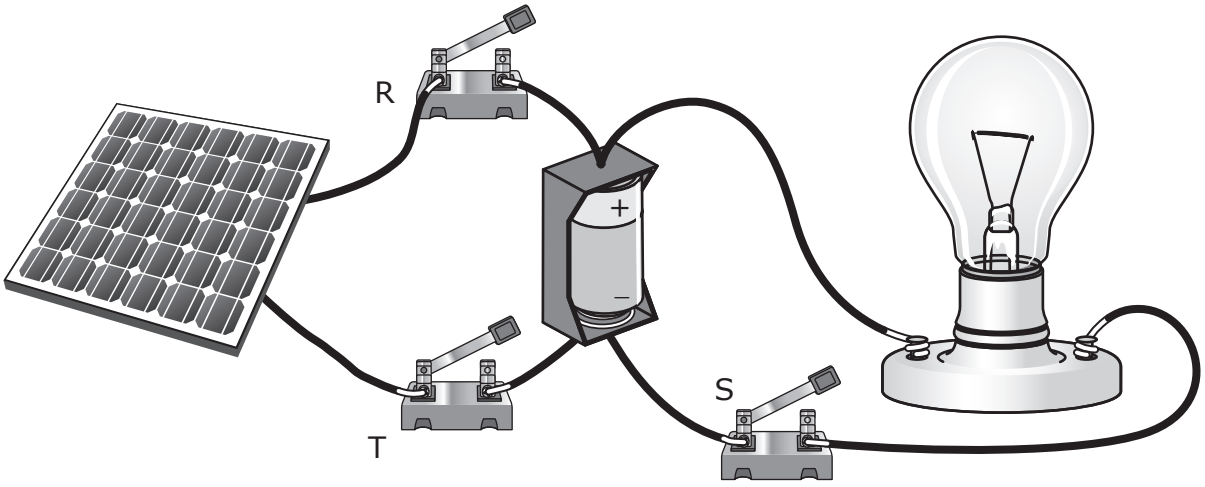
F The mosquito life cycle includes larvae that become pupae, while the dragonfly life cycle includes adults that develop directly from nymphs.

G The mosquito life cycle includes larvae with wings, while the dragonfly life cycle includes nymphs.

H The mosquito life cycle includes eggs that hatch in water, while the dragonfly life cycle includes nymphs that develop in water.

J The mosquito life cycle includes nymphs that hatch from eggs, while the dragonfly life cycle includes adults that develop directly from larvae.

25 A simplified diagram of a system using solar energy is shown.



To recharge the battery for later use without lighting the bulb, which of the following switches should be closed?

A Switch S only

B Switches R and S only

C Switches R and T only

D Switches R, S, and T

GO ON

26 Resources can be classified as renewable or nonrenewable. Which of these resources is classified in the same category as coal?

F Wood

G Wind

H Corn oil

J Petroleum

---

27 A student observes the following activities while walking in a park.

- A fire ant digging a tunnel in sandy soil
- A blue jay drinking water from a puddle
- A bee collecting pollen from a tree
- A hawk circling in the air over a tree

Which of these living organisms was interacting with another living organism in the environment?

A Fire ant

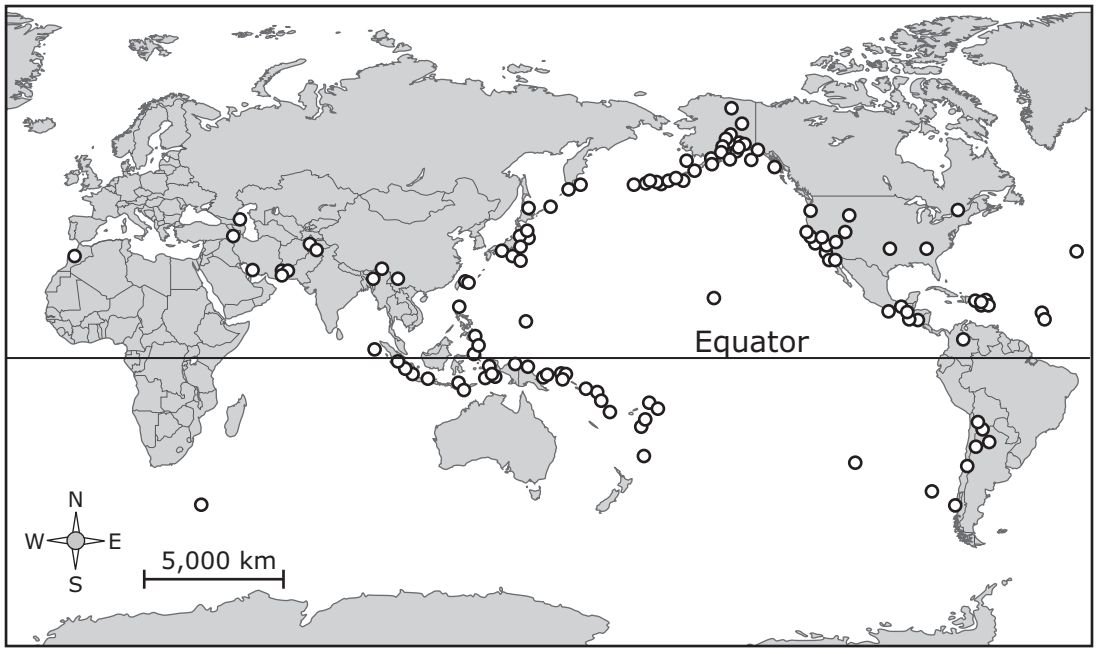
B Blue jay

C Bee

D Hawk

GO ON

28 A scientist was studying a type of event that occurred on Earth in various places within a 30-day period. The circles indicate where the events happened.



The events being studied involved rapid changes to Earth's surface at the locations shown on the map. What type of event do the circles on the map most likely represent?

F Landslides, because they are all located along ocean coastlines

G Volcanoes, because they occur only near the equator

H Earthquakes, because they occur on land and on the ocean floor

J Floods, because heavy rains can make riverbeds deeper and create deltas

GO ON

29 A science class tested three properties of different materials. The results are shown in the table below.

Material	Conducts electricity?	Conducts heat?	Is flexible?
Wood	No	No	No
Plastic	No	No	Yes
Copper	Yes	Yes	Yes
Steel	Yes	Yes	No

Based on the table, which material would be best to use to insulate electrical wires?

A Wood

B Plastic

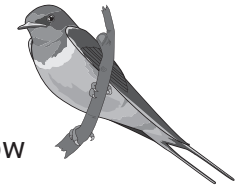
C Copper

D Steel

GO ON

30 The nesting habits of four types of birds are described in the table below.

Nesting Habits

Type of Bird	Nest Description
 Baltimore oriole	The nest hangs from thin branches in tall trees.
 Barn swallow	The nest is attached under the roof of a house or barn.
 Downy woodpecker	The nest is dug into rotting or decaying trees.
 Belted kingfisher	The nest is built in tunnels or burrows.

If all the dead branches and dying trees in a wooded area are removed, which bird's nesting habit would be most affected?

F Baltimore oriole

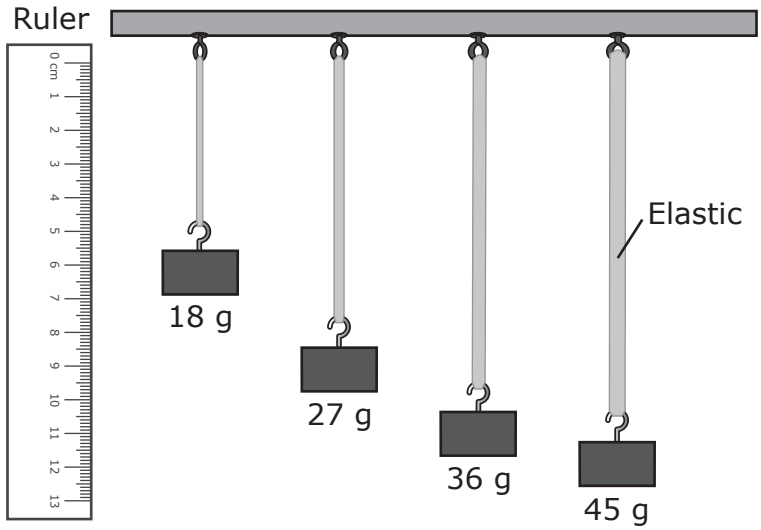
G Barn swallow

H Downy woodpecker

J Belted kingfisher

GO ON

31 A student designs an experiment to test the effect of the width of a piece of elastic on the elastic's ability to stretch. The student selects four pieces of elastic with different widths but the same length. The student then attaches blocks with different masses to the pieces of elastic. The results of the student's experiment are shown below.



What should the student do to improve this experiment?

A Use blocks of equal mass on the four pieces of elastic

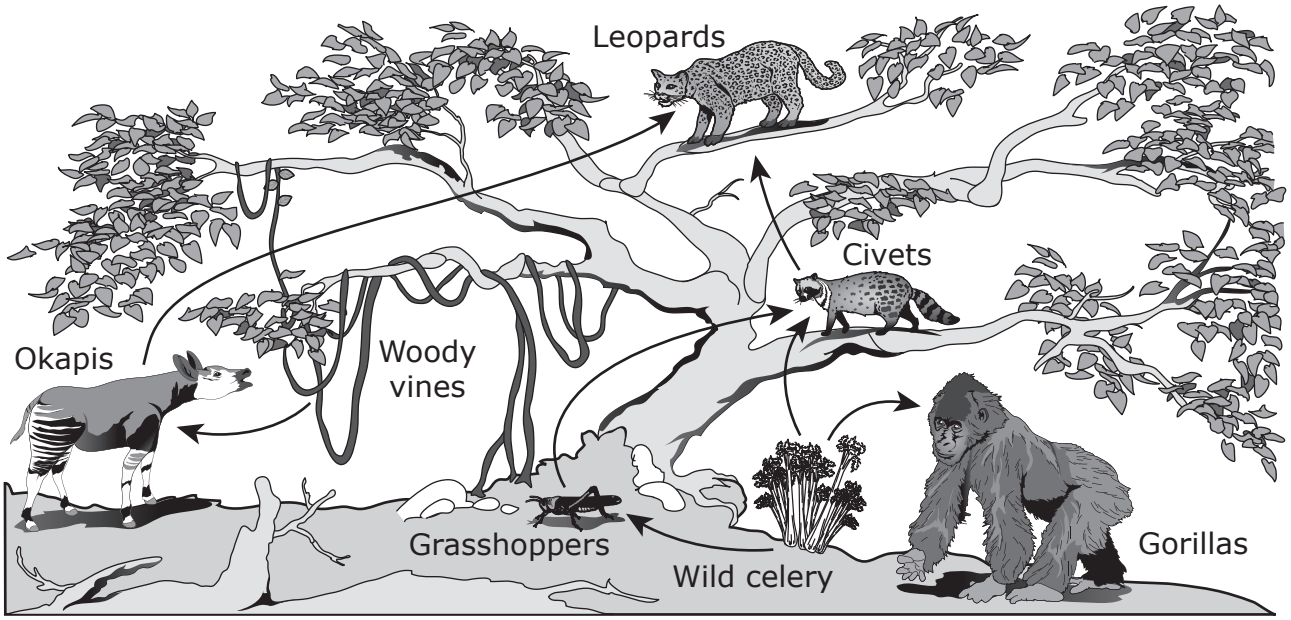
B Use blocks with enough mass to cause the four pieces of elastic to break

C Use more than four pieces of elastic and four blocks

D Use four pieces of elastic with different lengths but the same width

GO ON

32 A food web for some organisms in an African rain forest is shown below.



Which organisms in this food web eat only consumers?

F Okapis

G Civets

H Leopards

J Gorillas

GO ON

33 A student is looking for evidence that Earth is always rotating on its axis. Which of the following would provide the best evidence?

A The different amount of rain that falls each day

B The appearance of shadows changing throughout the day

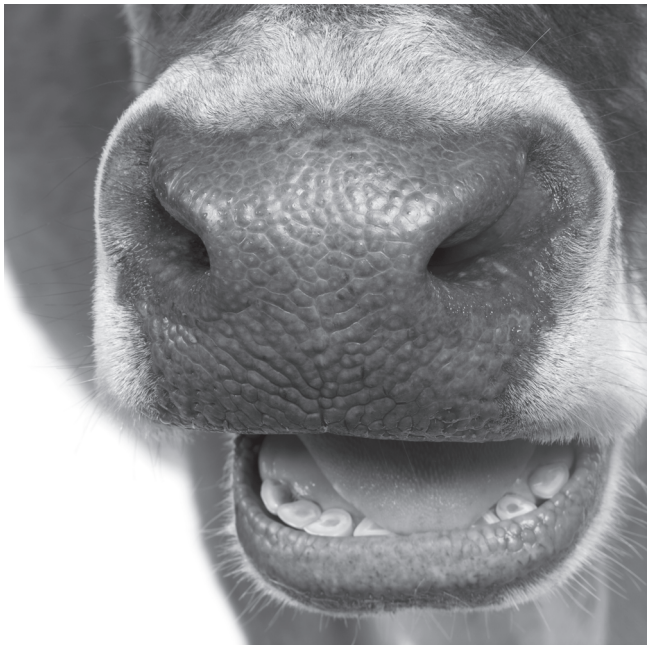
C The presence of other planets in the night sky

D The different phases of the moon in a month

GO ON

34 Some animals, such as lions, have pointed teeth, while other animals, such as cattle, have flat teeth.

© mariswanepoel/Fotolia



© Eric Isselée/Fotolia

The difference in the shape of these animals' teeth is most closely related to —

F the type of organisms the animals consume

G the sounds the animals make

H the habitat the animals live in

J the type of predators the animals have

GO ON

35 Cracks in the seafloor called hydrothermal vents send streams of hot water into the ocean. The water from a vent is 387°C. How many degrees above the boiling point of water is this temperature?

A 175°C

B 287°C

C 387°C

D 487°C

---

36 In 1859, Henry Bursill published a book of hand shadows. The picture below shows one of these hand shadows.

Which property of light makes it possible to produce hand shadows?

F Light can be refracted.

G Light is a form of energy.

H Light travels in straight lines.

J Light can be separated into different colors.

GO ON

37 Some species of rain forest frogs reproduce in the moist leaf litter on the forest floor. These frogs do not need a nearby body of water to complete their life cycle. Which stage of the typical frog life cycle is most likely missing from their life cycle?

A Egg

B Tadpole

C Froglet

D Adult frog

---

38 A group of fifth-grade students was researching alternative energy resources in the school library. Each student made a list of resources. Which list contains only alternative energy resources?

F

Alternative Energy Resources

- Wind
- Solar
- Oil
- Geothermal

H

Alternative Energy Resources

- Hydroelectric
- Coal
- Gas
- Wind

G

Alternative Energy Resources

- Biofuel
- Coal
- Geothermal
- Solar

J

Alternative Energy Resources

- Solar
- Biofuel
- Wind
- Geothermal

GO ON

39 When a bat searches for prey at night, it makes sounds as it flies, and it uses the sounds' echoes to find its prey. When the bat flies and listens to echoes to locate prey, it is using —

A thermal energy and light energy

B sound energy and thermal energy

C mechanical energy and sound energy

D light energy and mechanical energy

GO ON

40 A wide U-shaped valley is shown in the photograph below.

This valley was most likely formed by —

F flash flooding

G a glacier

H a hurricane

J melting snow

GO ON

41 A group of students made the observations listed below about the size, shape, and appearance of their hands.

1. Two students have scars on their hands.
2. Five students have pointer fingers that are longer than their ring fingers.
3. Nine students have ring fingers that are longer than their pointer fingers.
4. Six students have rings on their fingers.
5. Seven students have pointer fingers and ring fingers that are the same length.

Which of the students' observations describe inherited traits?

A Observations 2 and 5 only

B Observations 1, 3, and 4 only

C Observations 2, 3, and 5 only

D All the observations

---

42 Some people add sugar to their hot tea. Which property of the sugar remains the same when the sugar is in the tea solution?

F The taste of the sugar

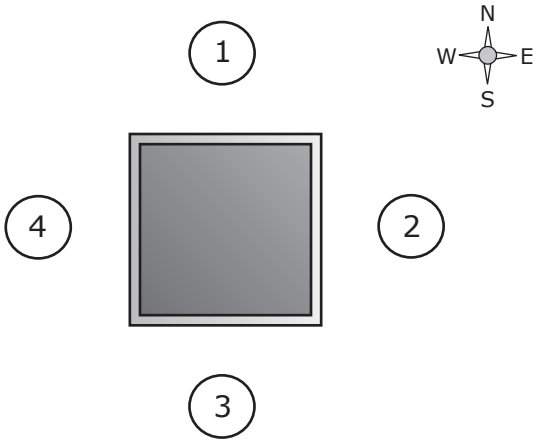
G The size of the sugar crystals

H The color of the sugar

J The texture of the sugar

GO ON

43 Four students stand facing a box. The diagram below shows an overhead view of the box. The numbered circles represent the positions of the students.



What do the students need to do to slide the box to the northeast?

A Students 1 and 2 push, and Students 3 and 4 pull.

B Students 1 and 4 push, and Students 2 and 3 pull.

C Students 2 and 3 push, and Students 1 and 4 pull.

D Students 3 and 4 push, and Students 1 and 2 pull.

GO ON

44 Some students make a model to show one of the first steps in the formation of sedimentary rock. The students pour 2 centimeters of light-colored sand into a clear plastic box. Then they add 1 centimeter of gravel. Finally they pour 2 centimeters of dark-colored sand on top of the gravel. Which characteristic of sedimentary rock does this model best show?

F Sedimentary rock is made of layers.

G Sedimentary rock is cemented bits of rock.

H Sedimentary rock is often limestone.

J Sedimentary rock is common in Texas.

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

STAAR
GRADE 5
Science
April 2015

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