4th Grade Science

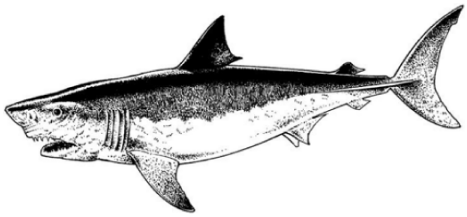
NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

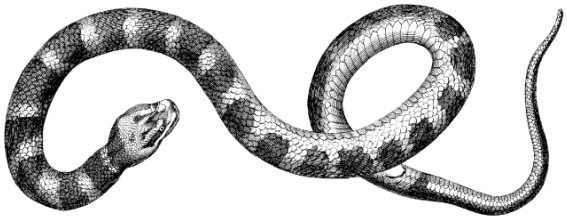
Directions

In this section, you will have 25 minutes to answer 16 questions. Mark your answers in your booklet. Circle the correct answer for each question or write your answers on the lines. Please think carefully about your answers. When you are writing your answers, be sure that your handwriting is clear.

Do not go past the STOP sign at the end of the sections. If you finish before time is called, you should go over your work again.

1. Which animal lives in water when very young and then lives on land as an adult?

A. 
Shark

B. 
Snake

C. 
Frog

D. 
Penguin

2. Which tool is used to measure how much rain falls during a storm?

A. 

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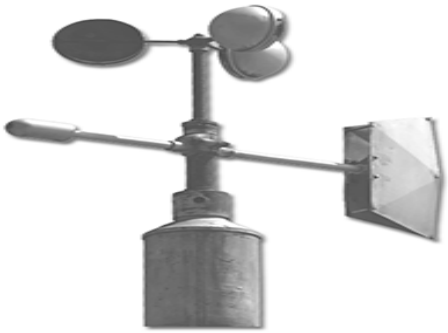
B. 
© Karen Harrison/iStockphoto #2898026

C. 

© Solymosi Tamas/iStockphoto #4139567

D. 
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Questions 3 – 4 refer to a bird called a warbler shown below.

Scientists study warblers by placing small metal bands on the birds' legs. A number is stamped on the band. This number lets scientists know when and where the birds are banded.

3. A scientist studying warblers captures six of them in a net. Two of the birds have bands on their legs.

What could the scientist learn from the information on the bands?

A. How much food the birds eat

B. Where the birds travel

C. Which birds are related

D. What kinds of nests the birds build

4. There are many kinds of warblers throughout the world. One kind of warbler with black-and-white feathers is often seen on tree trunks. Another kind with golden-colored feathers is often seen in fields.

Which statement best explains how the color of these warblers helps them survive?

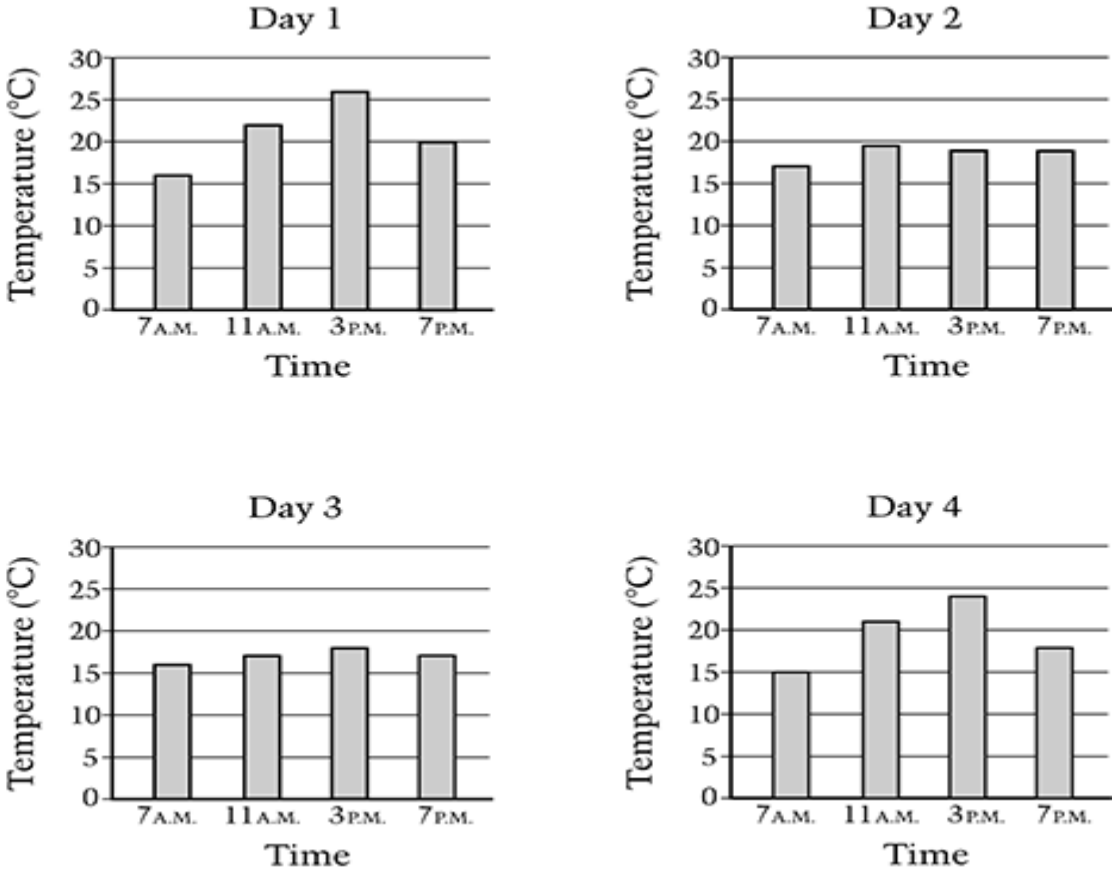
A. The color of the feathers helps the birds locate nests.

B. The color of the feathers helps to control the amount of body heat the birds lose.

C. The color of the feathers blends into the birds' surroundings and helps the birds avoid predators.

D. The color of the feathers attracts the kinds of insects the birds like to eat.

5. Grace's class measured the temperature outside four times a day for four days in a row. Their results are shown below.



Based on these data, choose two days that were most likely cloudy.

1. Day 1
2. Day 2
3. Day 3
4. Day 4

Explain why you chose these two days and why you did not choose the other days. Use the data in the graphs and your science knowledge about weather in your answer.

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6. A thermometer shows that the outside air temperature is colder than the temperature at which water turns to ice. However, ice on the sidewalk melts.

What probably caused this?

A. The air heating the sidewalk

B. The sidewalk reflecting sunlight into the air

C. The wind causing the ice on the sidewalk to melt

D. The sunlight making the sidewalk warmer than the air

7. Two students investigated the growth of pea plants.

Each student had three pots. All of the pots contained the same type and amount of soil. They planted pea seeds in each pot.

The students set up their investigations as shown in the table below.

	Volume of Water Added to Pots	Temperature of the Environment	Amount of Sunlight Pots Received
Michael	The same for each pot	Different for each pot	The same for each pot
Carmen	The same for each pot	The same for each pot	Different for each pot

Which student had the best setup to find out how the amount of sunlight affects the growth of pea plants?

1. Michael

2. Carmen

Explain why you chose this student's setup.

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What do you think you could learn about plant growth from the setup that you did not choose?

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8. Burning coal, oil, and gasoline for energy releases gases into the atmosphere that can be harmful to the environment. What are two ways that people can reduce the amount of these gases released into the atmosphere?

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2.

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9. Jane sees the Moon in the sky one clear night. It looks like the following picture.

What will the Moon look like three nights later if there are no clouds in the sky?

A. 

B. 

C. 

D 

10. A student poured the same amount of water into two identical cups. He put one cup in a refrigerator and left one cup out in a warm room. Neither cup was touched.

The diagram below shows how much water was left in the cups two days later.

A B

Which cup was in the refrigerator? Fill in only one oval.

- □ Cup A
- □ Cup B

Explain your answer.

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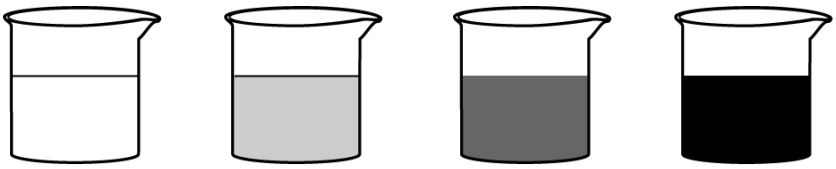
11. Janet has four identical containers. In each container there are 200 grams of a different colored sand, as shown below. All the sand is at the same temperature and has the same grain size.



White Pink Brown Black

Janet leaves the containers out in the full sun for three hours. Then she measures the temperature of the sand in each container. Her results are shown below.

White	Pink	Brown	Black
22°C	28°C	41°C	45°C

Explain why the temperature of the sand in each container is different.

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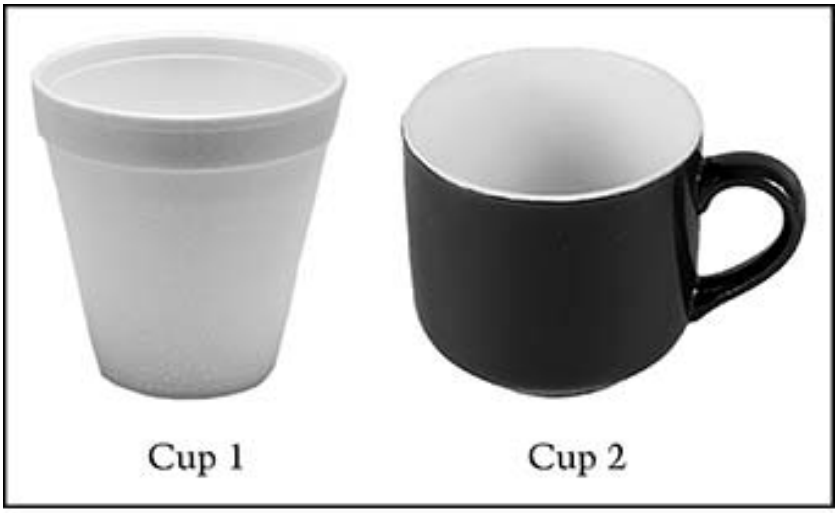
12. A student wants to know whether two cups hold the same volume of water. The two cups have different weights (masses).



The student completely fills Cup 1 with water. The student wants to measure if Cup 2 holds the same volume of water.

What should the student do next to complete the measurements?

a. Completely fill Cup 2 with water and then look at the cups side by side

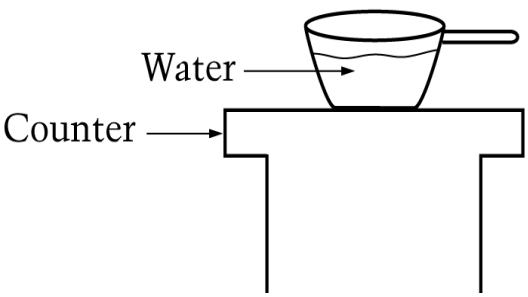
b. Pour half of the water from Cup 1 into Cup 2, weigh each cup and then compare their weights

c. Pour all of the water from Cup 1 into Cup 2 to see if the water completely fills Cup 2 without spilling over

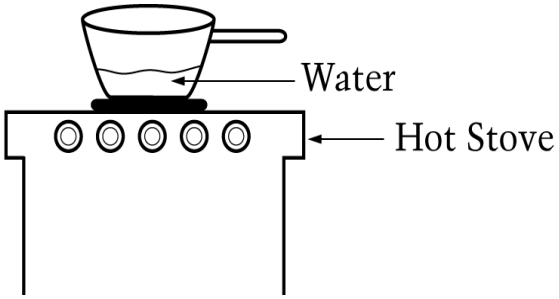
d. Completely fill Cup 2 with water, weigh each filled cup, and then compare the weights

13. Anita puts the same amount of water in two pots of the same size and type. She places one pot of water on the counter and one pot of water on a hot stove.

After ten minutes, Anita observes that there is less water in the pot on the hot stove than in the pot on the counter, as shown below.



Pot of Water on Counter



Pot of Water on Hot Stove

Why is there less water in the pot on the hot stove?

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Where did the water go?

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14. Which animal develops inside its mother before it is born alive?

a. Butterfly

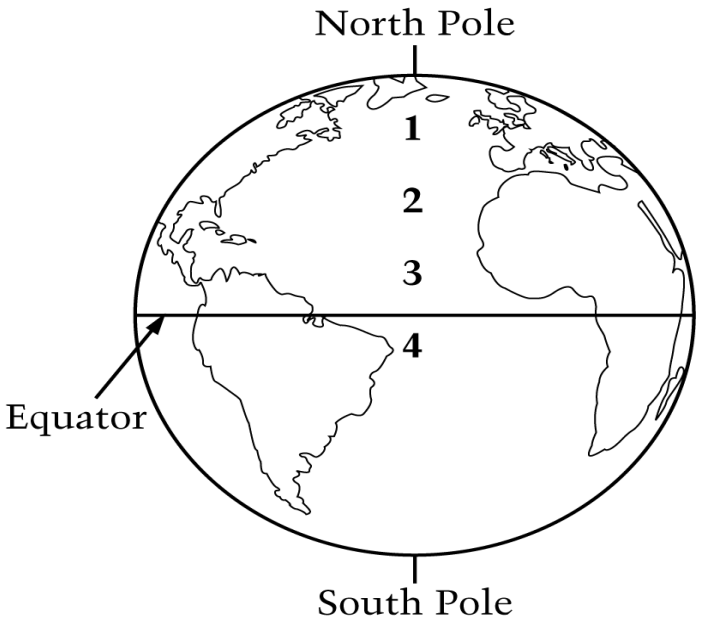
b. Cat

c. Duck

d. Frog

15. The diagram below shows four places on Earth. Places 1, 2, 3, and 4 are all at sea level.

PLACES ON EARTH



Which place has the coldest winters?

A. 1

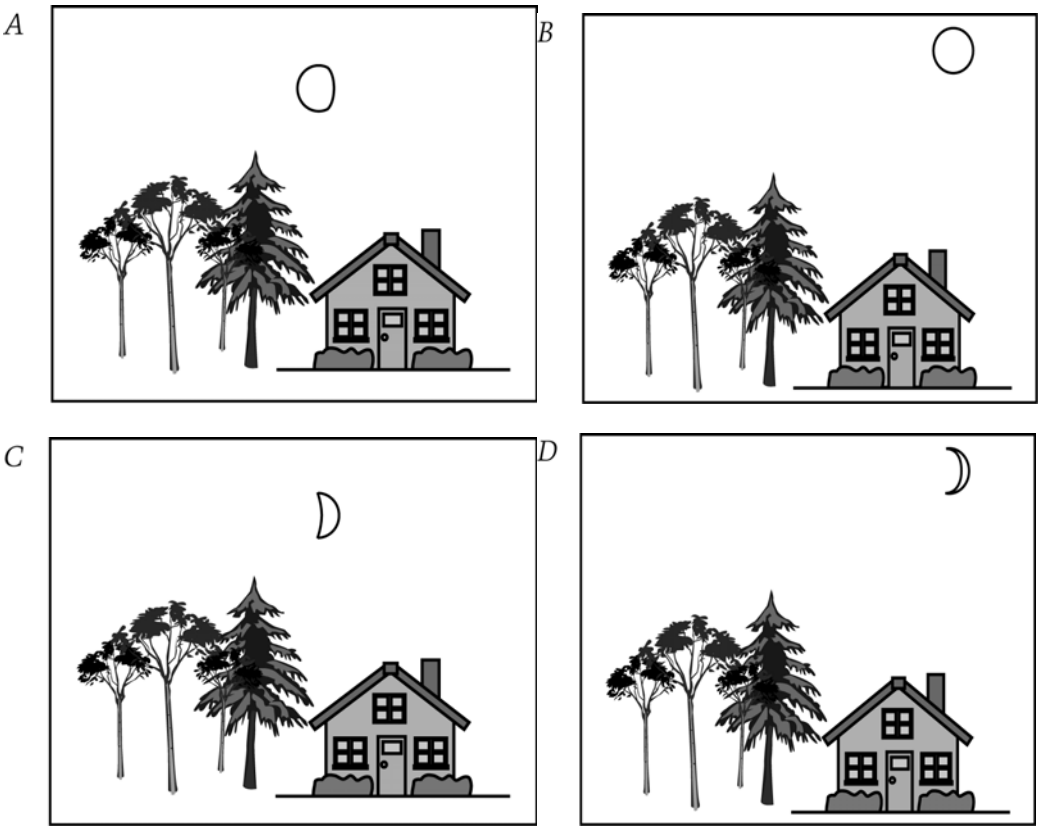
B. 2

C. 3

D. 4

16. Jane sees the Moon in the sky one night.

Look at the four diagrams below.



Jane stands in the same spot to observe the Moon two hours later. Which diagram shows what she will most likely see?

A. A B. B C. C D. D

Directions

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17. Which material is the best conductor of electricity?

A. Wood

B. Metal

C. Stone

D. Plastic

18. Roger poured water over a pile of sand. Some of the sand washed away. This process is similar to which of the following?

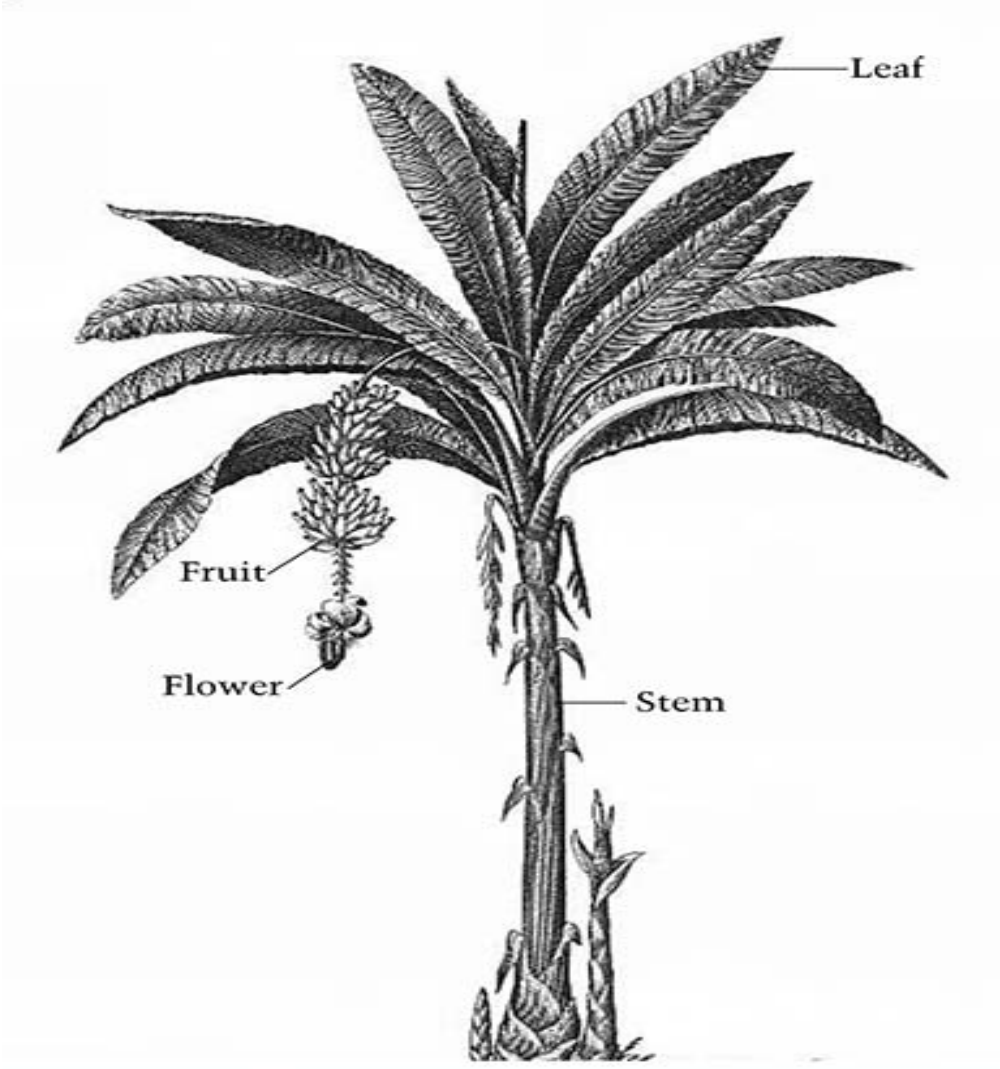
A. The eruption of a volcano

B. The erosion of the walls of a canyon

C. The uplifting of mountain ranges

D. The forming of dunes or mounds in a desert

19. Look at the banana plant shown below.



What part of this plant helps it get the most light?

A. Green fruit

B. A peeling, thick stem

C. Wide, long leaves

D. Brightly colored flowers

20. When people buy groceries, they may have their groceries packed in plastic bags, paper bags, or cloth bags they bring with them.

Which type of grocery bag is best to use to help protect the environment?

1. Plastic
2. Paper
3. Cloth

Explain why your choice helps protect the environment.

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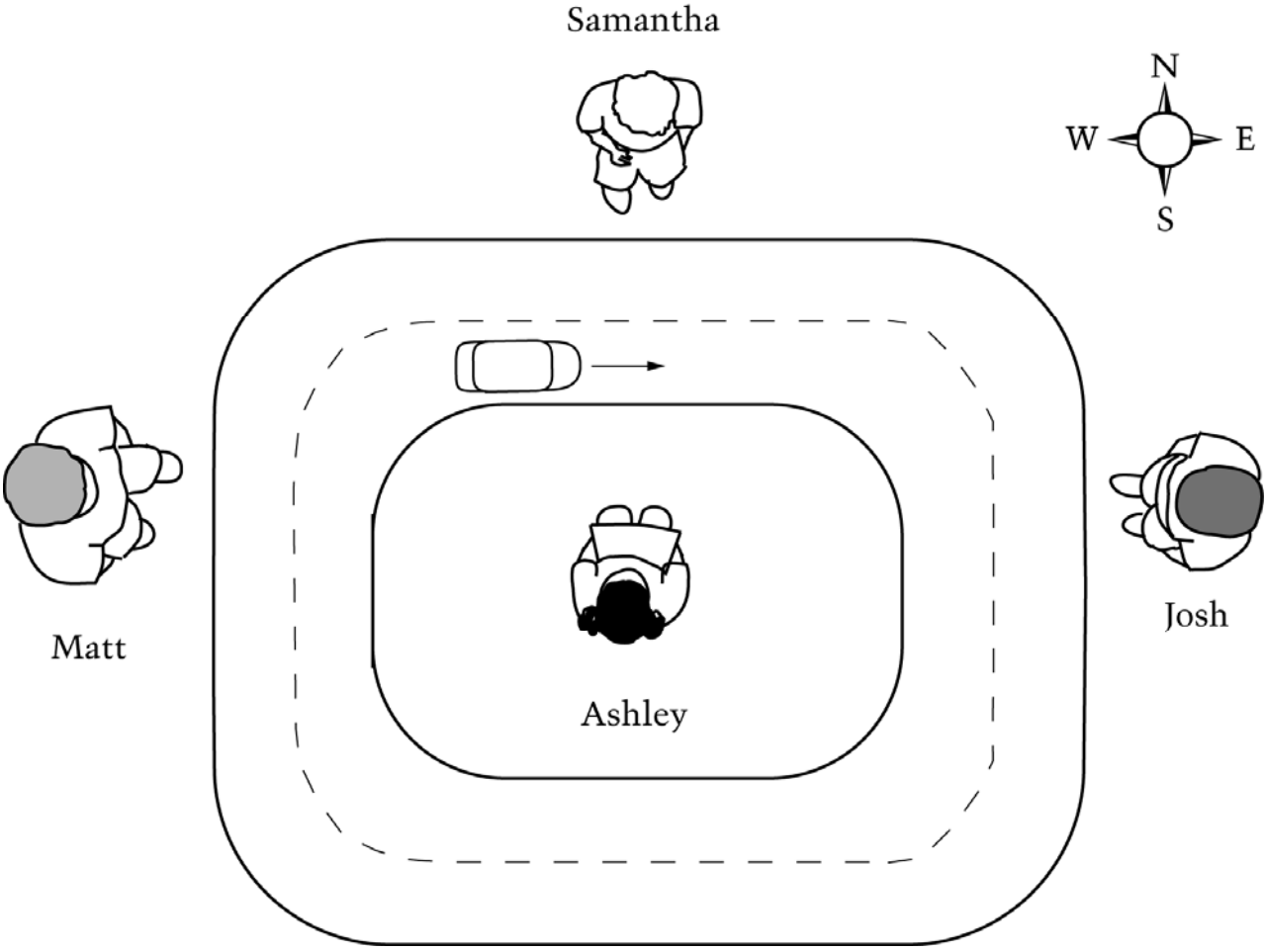
21. Which statement explains why light from the Sun can warm up water in a glass?

A. Light travels very fast.
B. Light travels in straight lines.
C. Water reflects light energy.
D. Water absorbs light energy.

The following question refers to the diagram below.
The diagram below shows the top of a toy car as it travels on a curved track. Four students, Matt, Samantha, Josh, and Ashley stand in the positions shown and watch the toy car move.



22. When the toy car is in the position shown in the diagram, which student sees the car as moving away from him or her?
    A. Ashley
    B. Josh
    C. Matt
    D. Samantha

23. When the toy car is in the position shown in the diagram, what can all four students correctly conclude about the direction in which the car is moving?
    A. The car is moving left to right.
    B. The car is moving right to left.
    C. The car is moving east to west.
    D. The car is moving west to east.

24. A bird-watcher wants to see many birds in a one-hour period. She decides to investigate which type of food will attract more birds in her backyard.

She has a choice of two types of bird food.

1. Sunflower seeds

2. Thistle seeds

Describe a fair test the bird-watcher could conduct to help her decide which food will attract more birds.

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What information should the bird-watcher collect from her test to help decide which type of food attracts more birds?

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25. Jaime and Manuel visit the zoo. They see two male tigers who are brothers. Jaime points out that the fur of one of the tigers has stripes that are a darker brown than the other tiger's stripes.

Manuel says the tigers cannot be brothers.

How can Jaime explain to Manuel that tigers with different-colored stripes can be brothers? In your answer, use a specific example of what you have observed about similarities and differences between people who are related.

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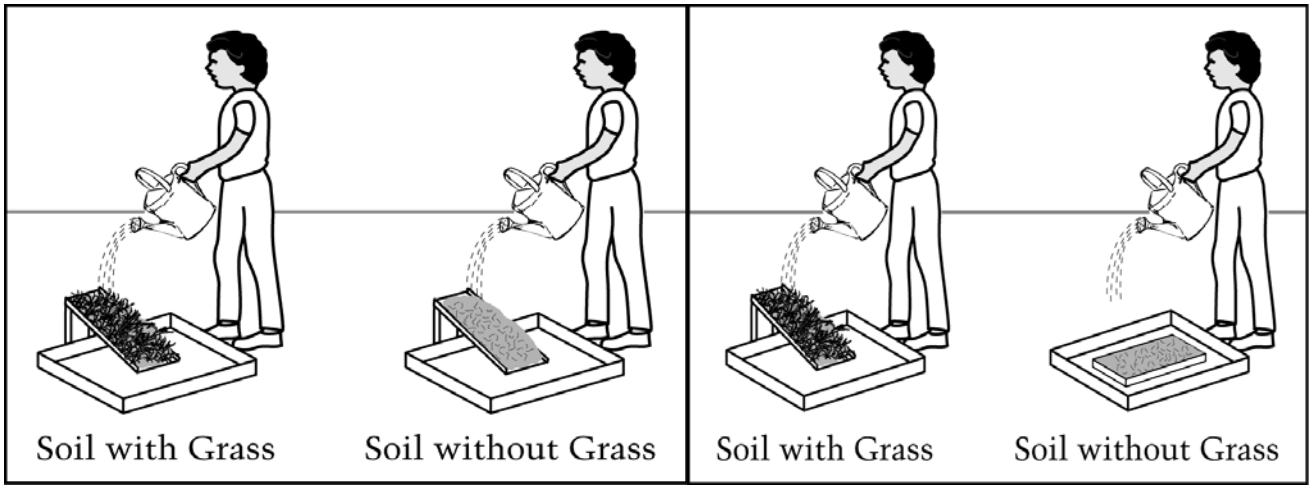
The following question refers to the following information.
Rafael lives near a road at the bottom of a hill. His parents are concerned that soil will wash off the hill and rocks will fall onto the road.

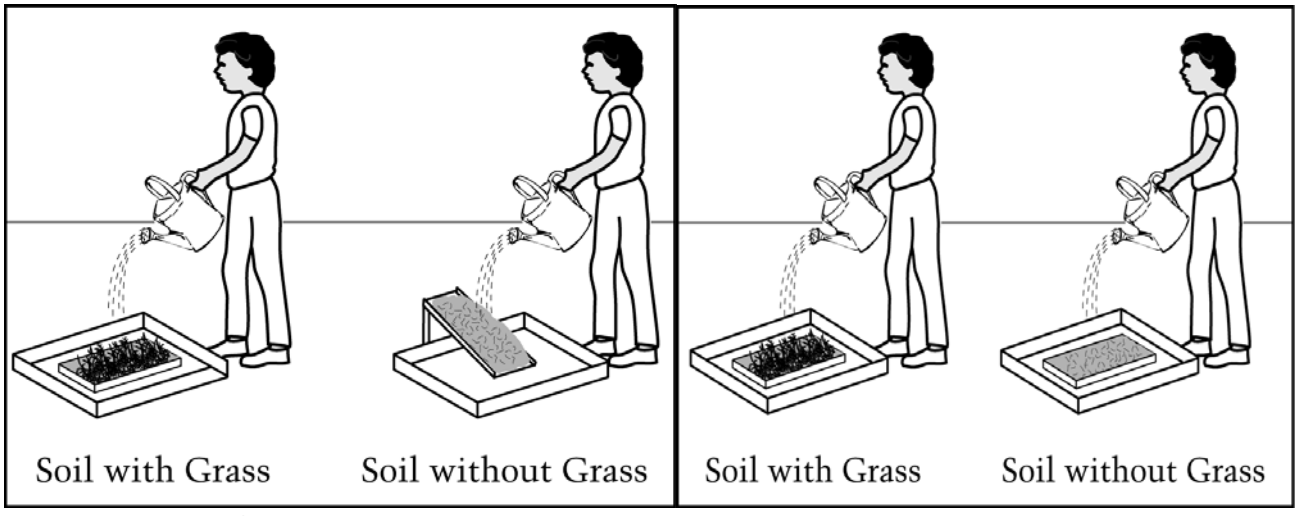
Rafael conducts an investigation to find out if grass growing on a hillside will help stop soil erosion.

He collects two samples of the same size and type of soil. One sample of soil has grass growing on it and the other does not. He places each sample of soil in a small tray.

26. For his investigation, Rafael pours the same amount of water onto both samples of soil. He uses a large tray to collect water that may flow through the soil.
Which practice shows the best way for Rafael to set up this investigation?



A B



C D

27. Rafael predicts that the water he pours on the soil without grass will carry away more soil than the water he pours on the soil with grass.
Do you agree with Rafael's prediction?

1. Yes
2. No

Explain why you agree or disagree.

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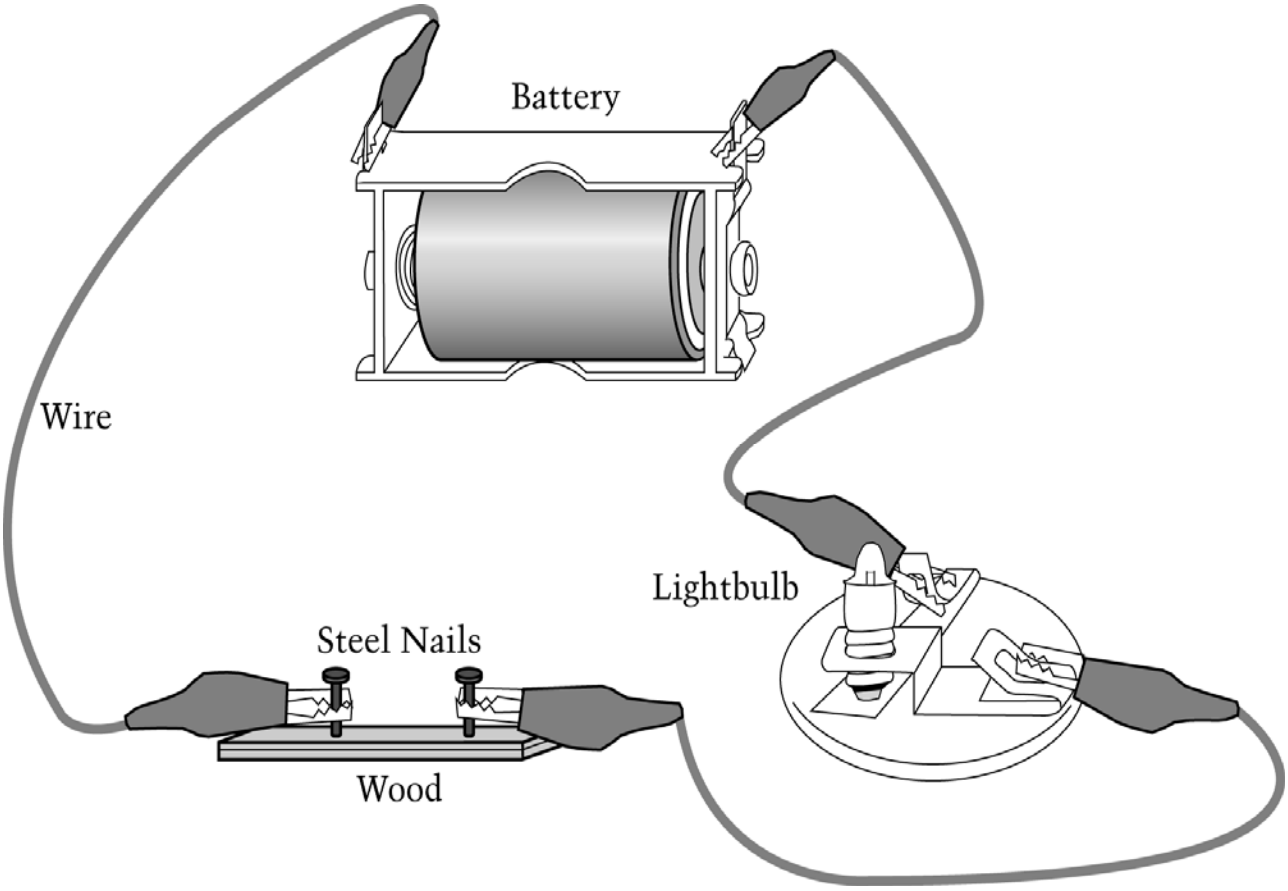
28. After pouring the water onto both pieces of soil, Rafael makes an observation. The water collected in the tray under the soil with grass looks clearer than the water collected in the tray under the soil without grass.
What conclusion can Rafael make from his observation?

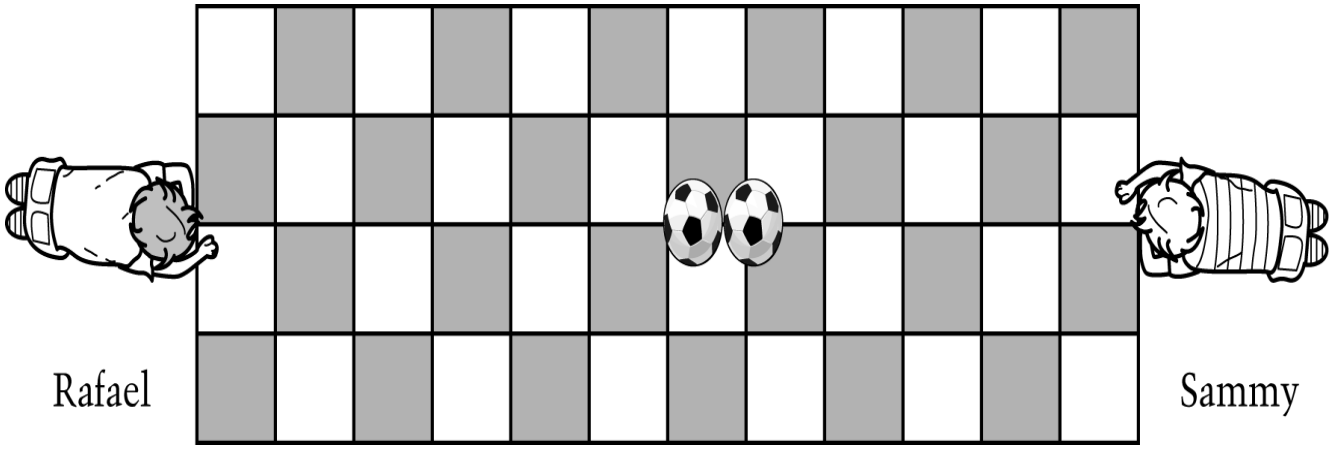
A. The grass helped to hold the soil in place.
B. The grass helped to move the water through the soil.
C. The soil without grass was sticky, so more water stayed in the soil.
D. The soil without grass was loose, so more water stayed in the soil.



29. A student tried to connect an electrical circuit as shown above. The lightbulb did not light up. What can the student do to make the lightbulb light up?

A. Connect a second battery to the first battery.
B. Replace the wires with thicker wires.
C. Replace the steel nails with aluminum nails.
D. Connect the steel nails with a short piece of wire.

30. Rafael and Sammy were playing with soccer balls on a flat tile floor. Each boy rolled a soccer ball at the same time, and the balls hit, as shown below.



Which boy rolled his ball faster?

_____

_____

How do you know?

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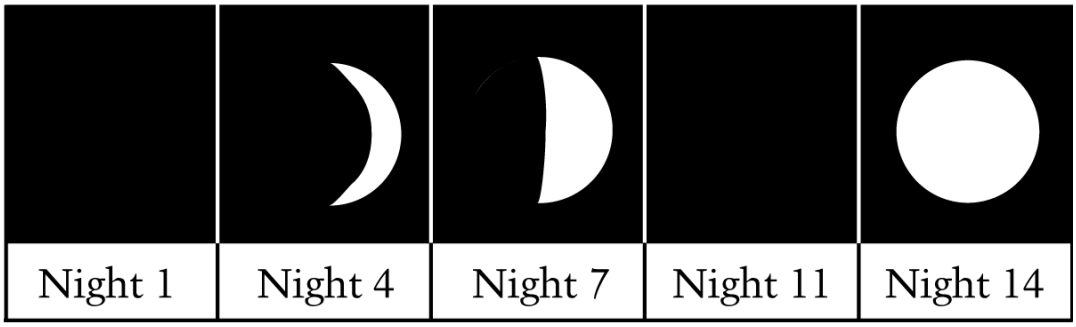
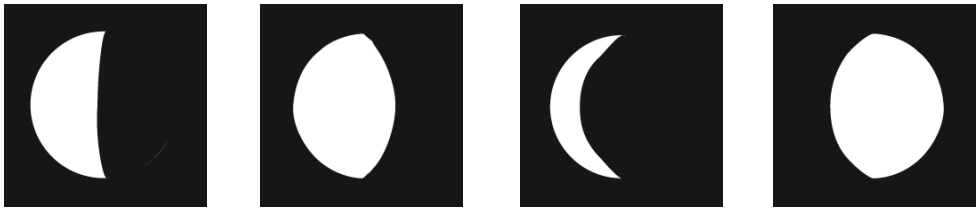
31. Jennifer drew what the Moon looked like just after sunset every third or fourth night. Her drawings for the nights she observed the Moon are shown below.



On Night 11 the clouds were so thick that Jennifer could not see the Moon.

Based on the drawings for the other nights, what would Jennifer have seen on Night 11 if the sky were clear?



A. B. C. D.

32. Which is an example of melting?

A. Flowing water making a rock smooth
B. A carrot becoming soft when cooked
C. Sugar mixed into tea making the tea sweet
D. Butter changing into liquid in a warm pan