Name _____

Minnesota Comprehensive Assessments-Series III

Science Item Sampler
Grade 8

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DEPARTMENT OF EDUCATION

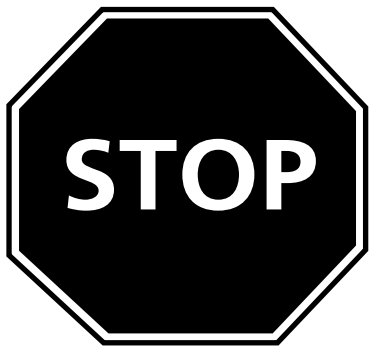
24 Point

Directions for Science Test

- For each question, choose the answer or answers you think are best.
- You must answer each question in your test book.
- You can use scratch paper or write in your test book to help you answer the questions.
- When you finish a segment, review your answers. Then raise your hand for a sticker to seal the segment. Once you seal it, you cannot go back.

On this test, do your own best work to show what you know and can do.

- Do not accept help finding answers to test questions.
- Do not give answers to other students.
- Do not tell others what is on the test.
- There may be consequences if you do not follow directions or if you behave dishonestly.



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Segment 1

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1

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Lake Superior

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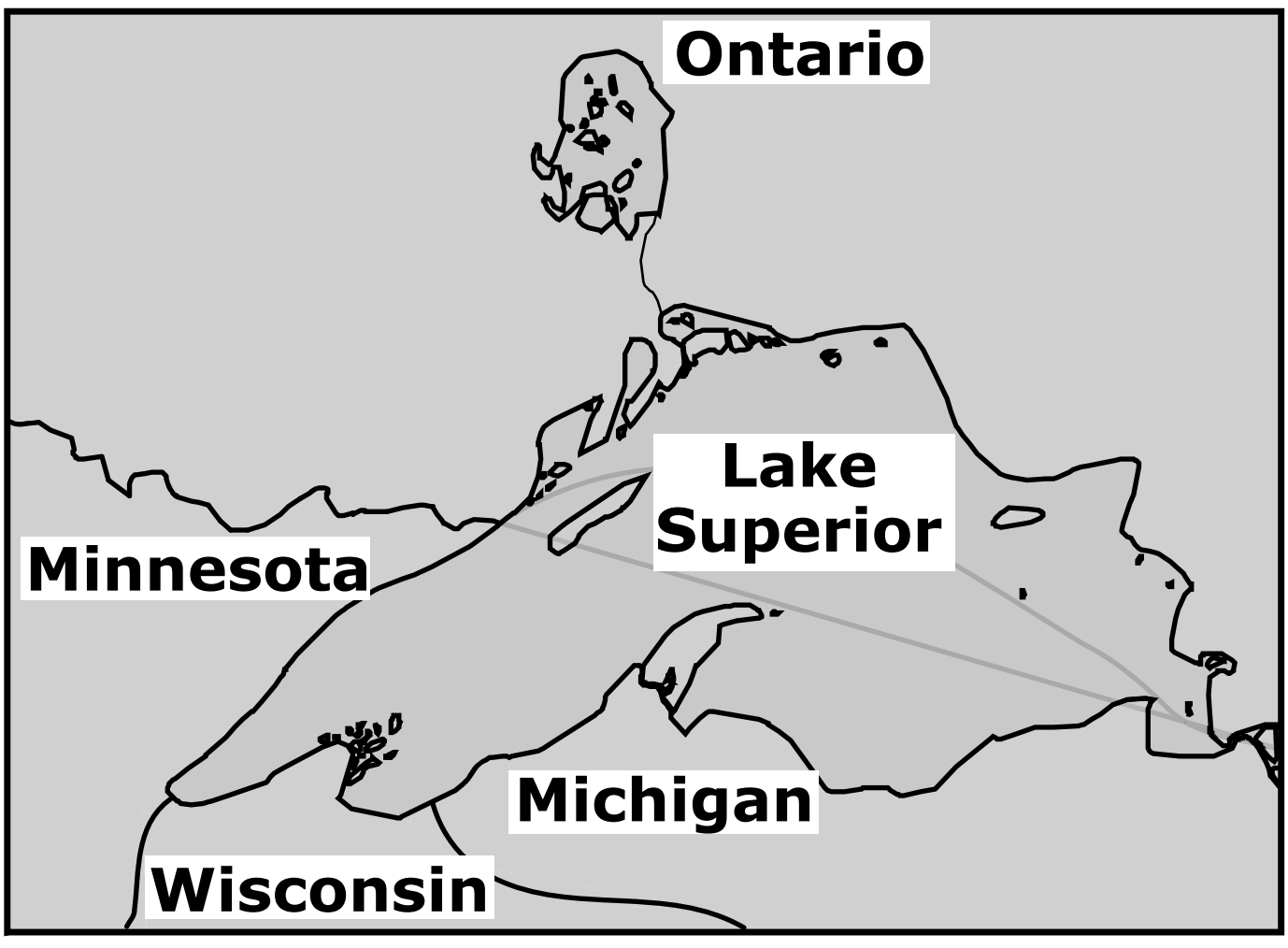
1 About 10,000 years ago, the last glaciers melted around the Lake Superior area and filled the lake with water. For the past few hundred years, agricultural and manufacturing developments have caused pollution in the lake.



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1. Which observation suggests that Minnesota was covered by glaciers in the past?

1

A. Rocks have fossils.

B. Rocks show wind erosion.

C. Rocks show chemical weathering.

D. Rocks have scrapes and striations.

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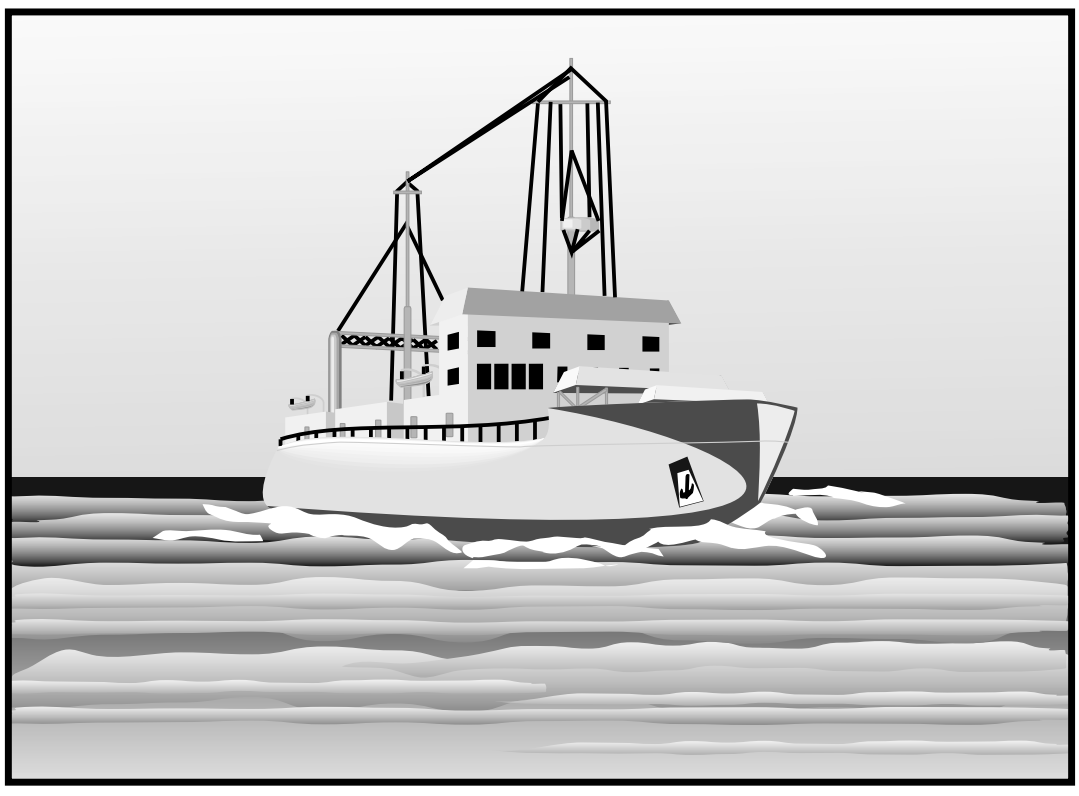
1 To learn more about the pollution in Lake Superior, scientists travel in a boat to collect samples from different areas of the lake. Before going out on the lake, the scientists must study the local weather in order to safely travel on the lake.



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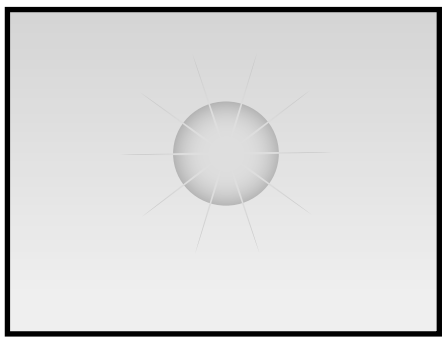
1

2. Based on the air pressure data, which 2 weather predictions will most likely be accurate?

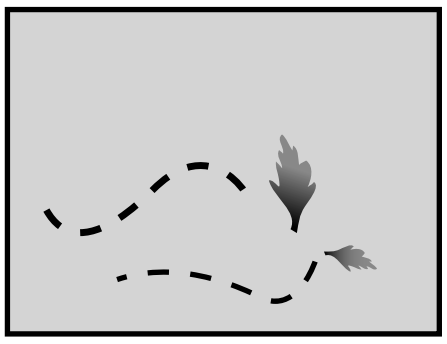
Circle the 2 weather predictions you want to select.

Time of Day	Air Pressure (millibars)
6 a.m.	978
Noon	1,010
6 p.m.	1,010
Midnight	1,010

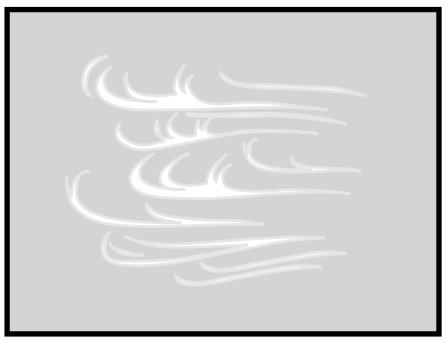
Weather Predictions



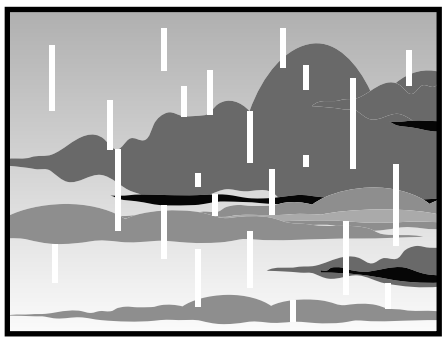
Fair weather



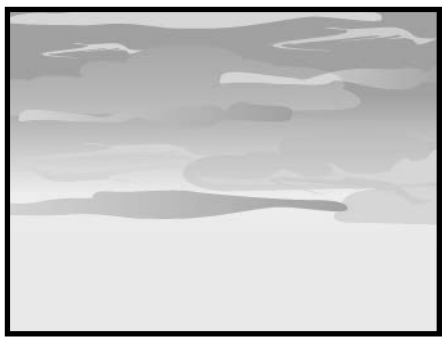
Strong winds



Cirrus clouds



Heavy rain



Stratus clouds

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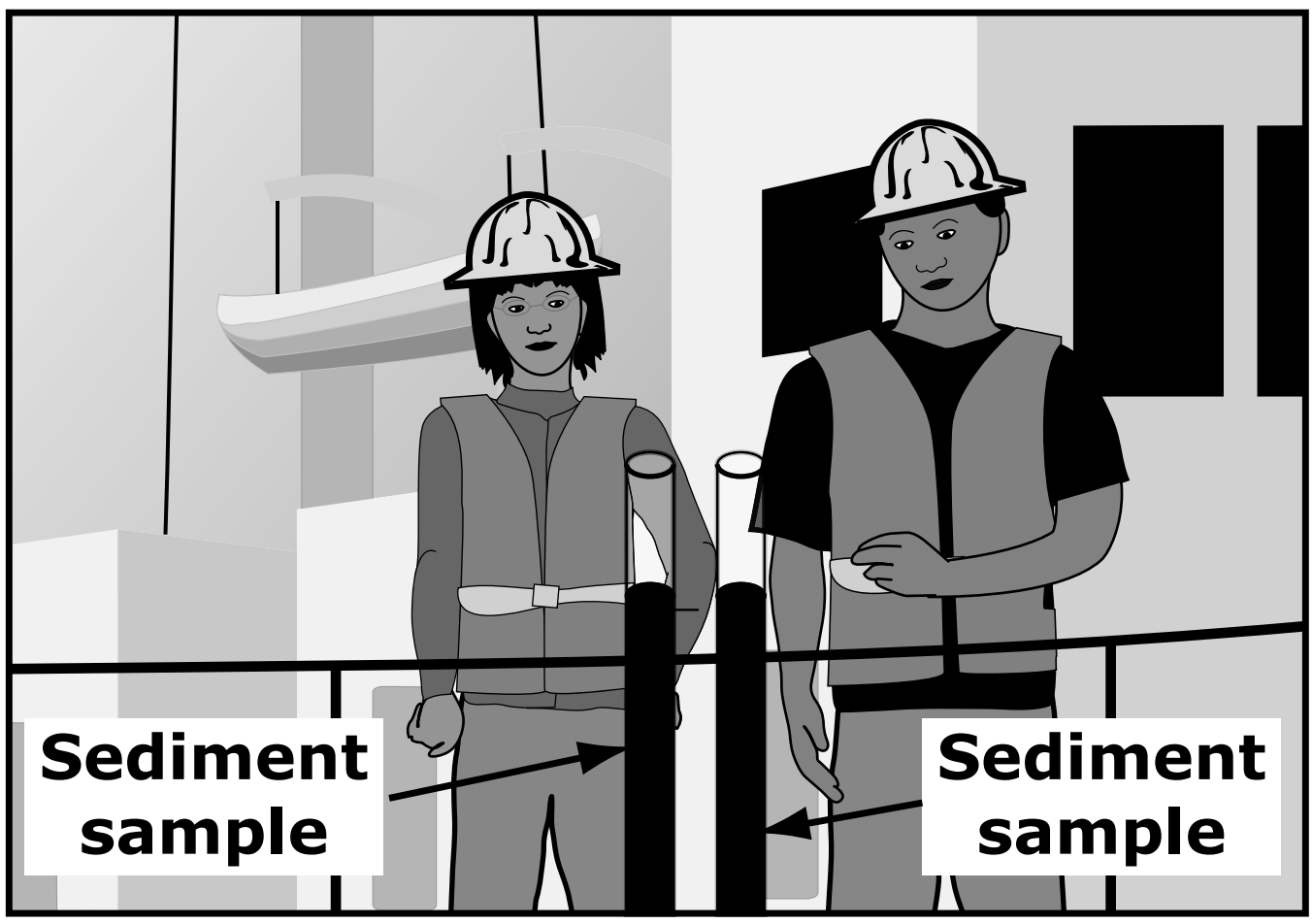
1 The scientists on the boat discover many pollutants in the lake sediment.



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Pollutants Found in Lake Superior Sediments
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Pesticides
Zinc

Go on to the next page.

1

3. Based on the data collected, which testable question are the scientists trying to answer?

A. What is the source of the pollution?

B. Which pollutants are found in the lake?

C. Which pollutants have been in the water the longest?

D. What effect does the pollution have on the lake ecosystem?

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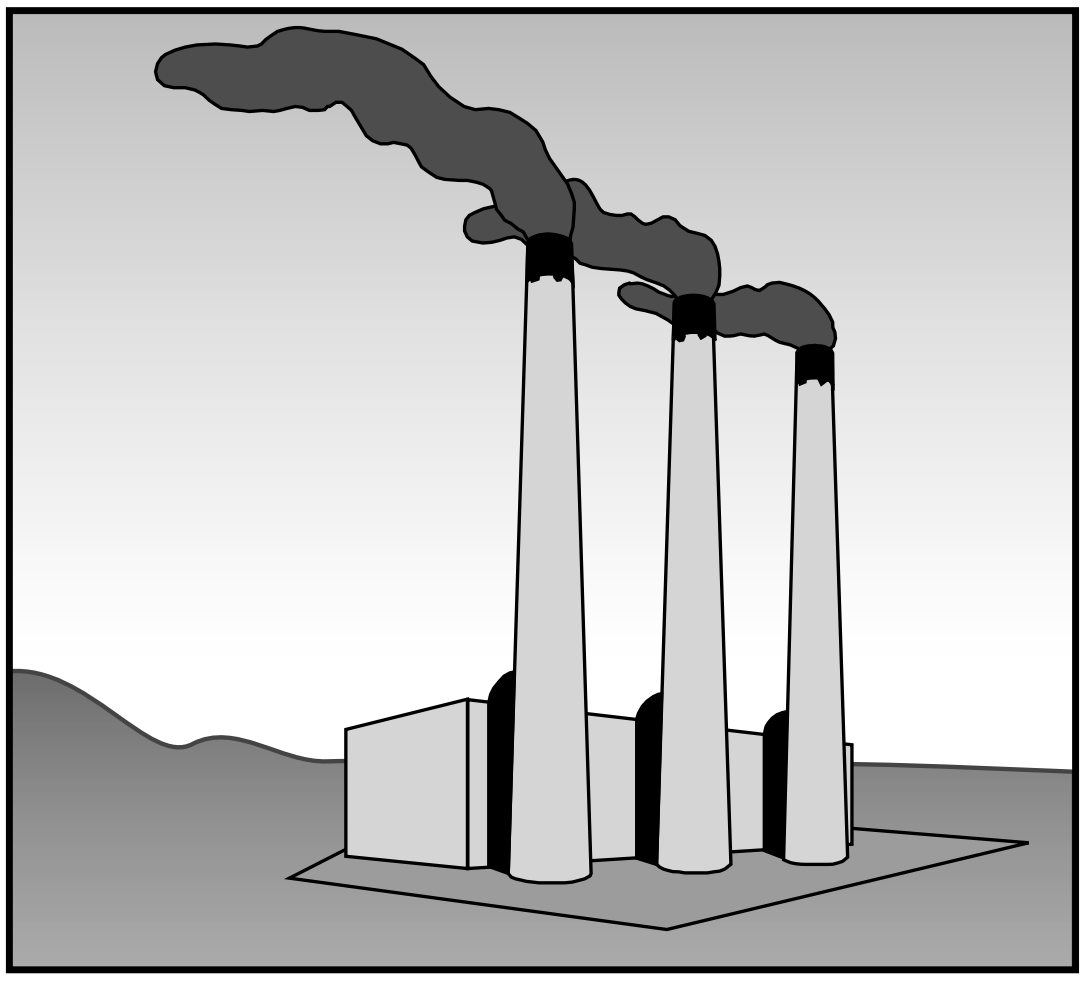
1 Mercury is 1 pollutant found in Lake Superior. The largest source of mercury pollution comes from burning coal in power plants. Data shows that air currents can carry pollutants from power plants that are hundreds of miles away.



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4. Show how these factors would most likely change if people began to use less energy. 1

Each change is labeled A, B, C, D, E, or F. Write the letter of the correct change into each box. You may use each letter 1 time. Three of the labels will be used.

Changes When Less Energy is Used

Amount of Coal Burned	Amount of Mercury Released	Condition of the Lake

A. increases

B. decreases

C. increases

D. decreases

E. improves

F. declines

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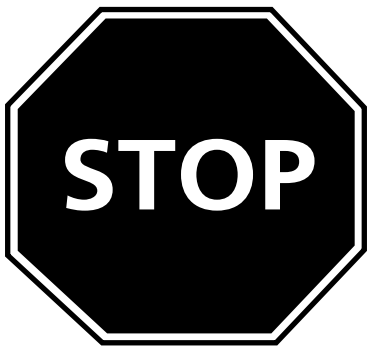

Segment 2

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Pea Plant Experiment

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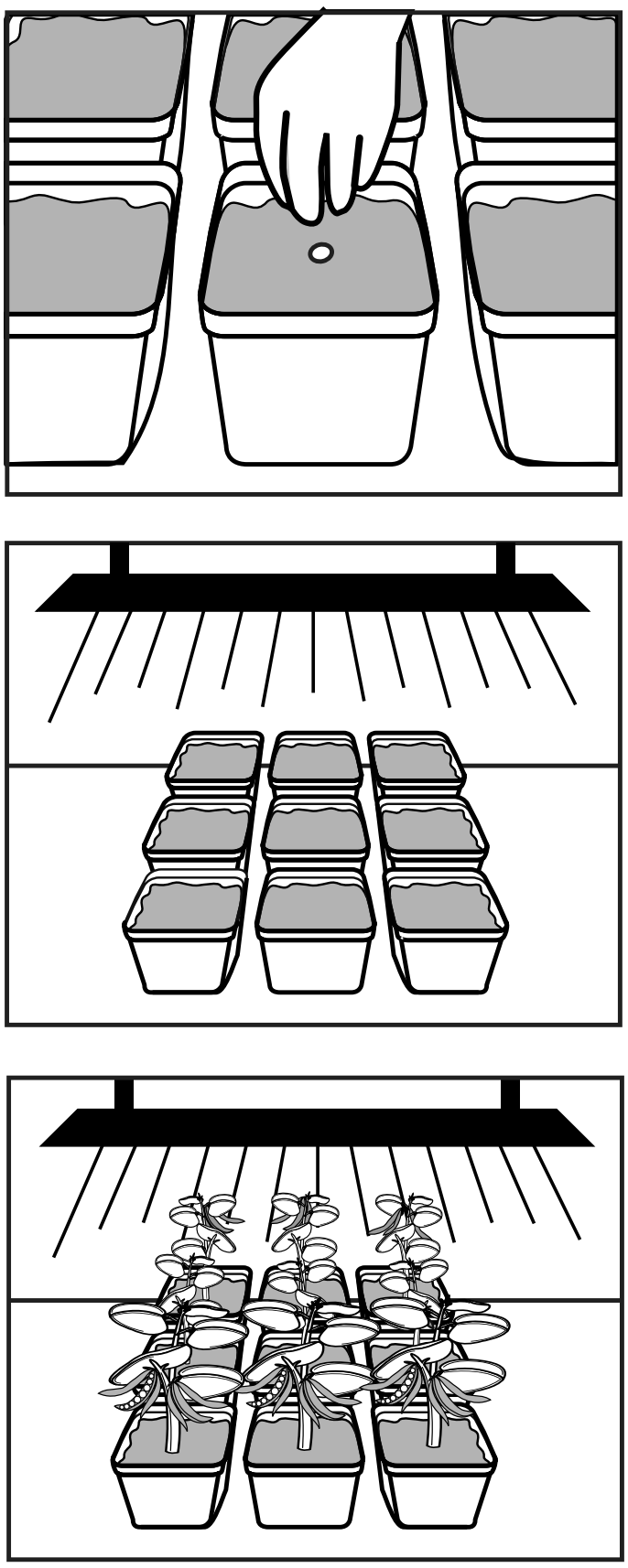
A student plants pea seeds in containers. Each container has the same type of soil and receives the same amounts of water and light. The pea seeds grow into mature plants.



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5. What 2 substances do plants take in to make sugars during photosynthesis?

A. Soil and light

B. Water and oxygen

C. Soil and carbon dioxide

D. Water and carbon dioxide

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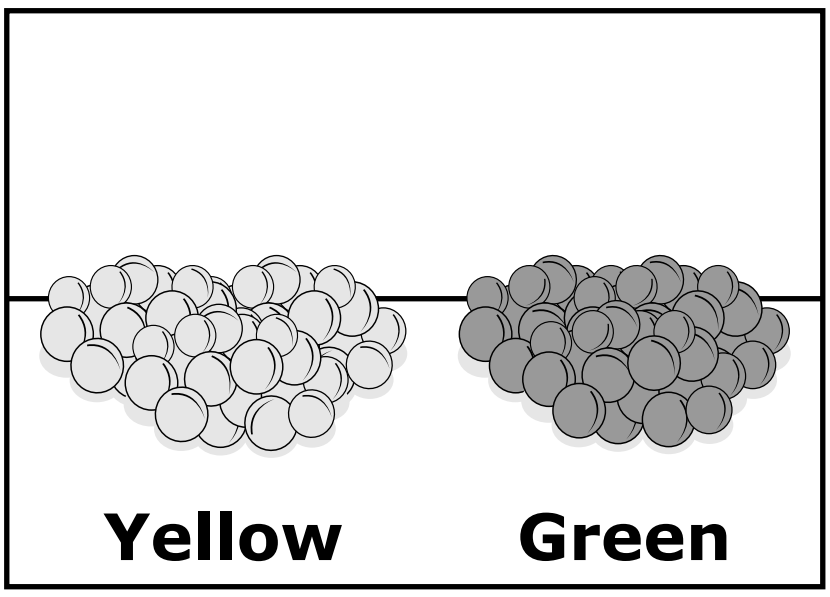
The student collects the seeds from the mature pea plants. Some of the seeds are green and some are yellow. The student records the data about seed color in a table.



Number of Pea Seeds	
Green	245
Yellow	255

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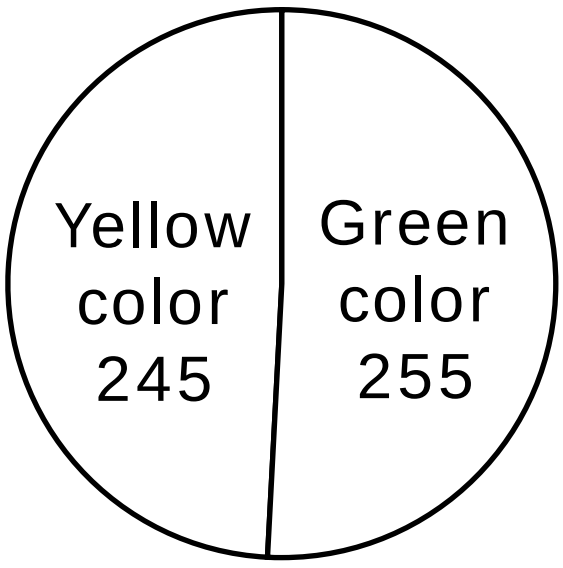
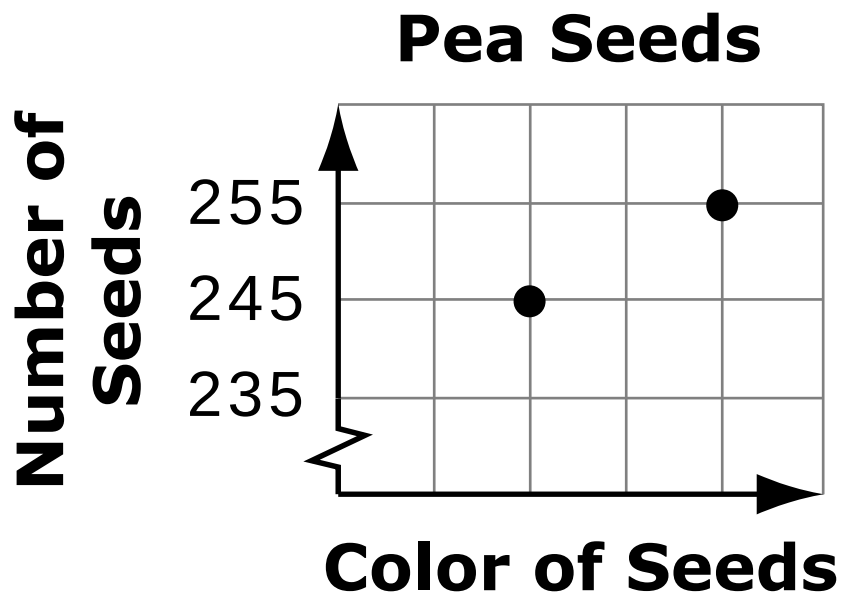
6. Which graph best shows the information from the table?

A.



B.



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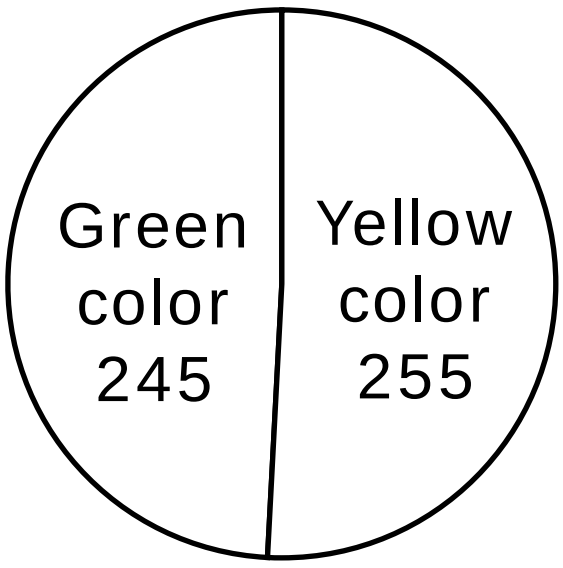
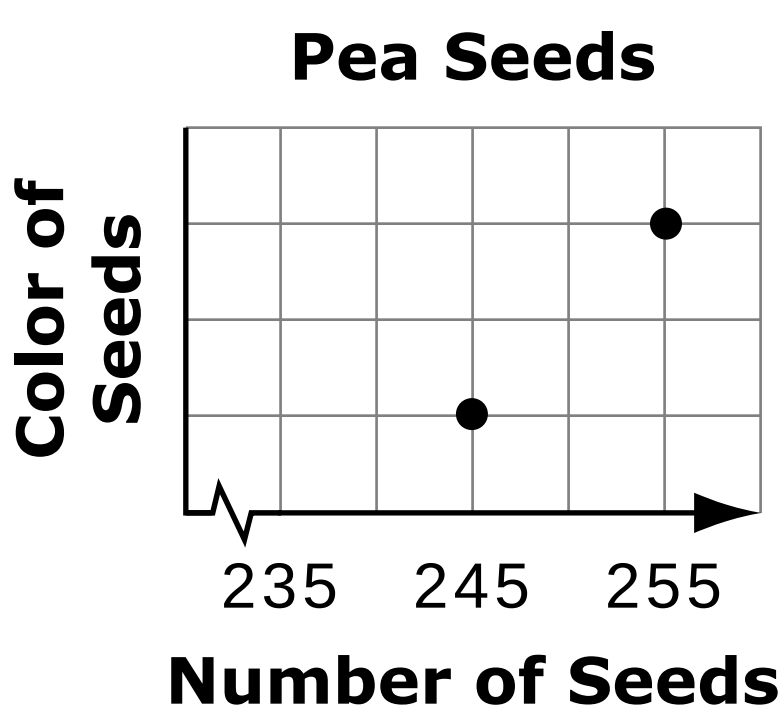
C.



D.



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7. Reproduction is important for a species to survive. Select one factor that might affect a species. Then select the most likely outcome of that factor.

Each factor is labeled A, B, or C, and each outcome is labeled D, E, or F. Write the letter of the correct factor and the outcome into each empty box. Use one letter for the factor and one letter for the outcome.

2

Factor		Outcome	

A.	large amount of genetic diversity	**D.**	decreased chance of species survival
B.	small number of organisms	**E.**	increased chance of species survival
C.	negative change in environment	**F.**	no chance of species survival

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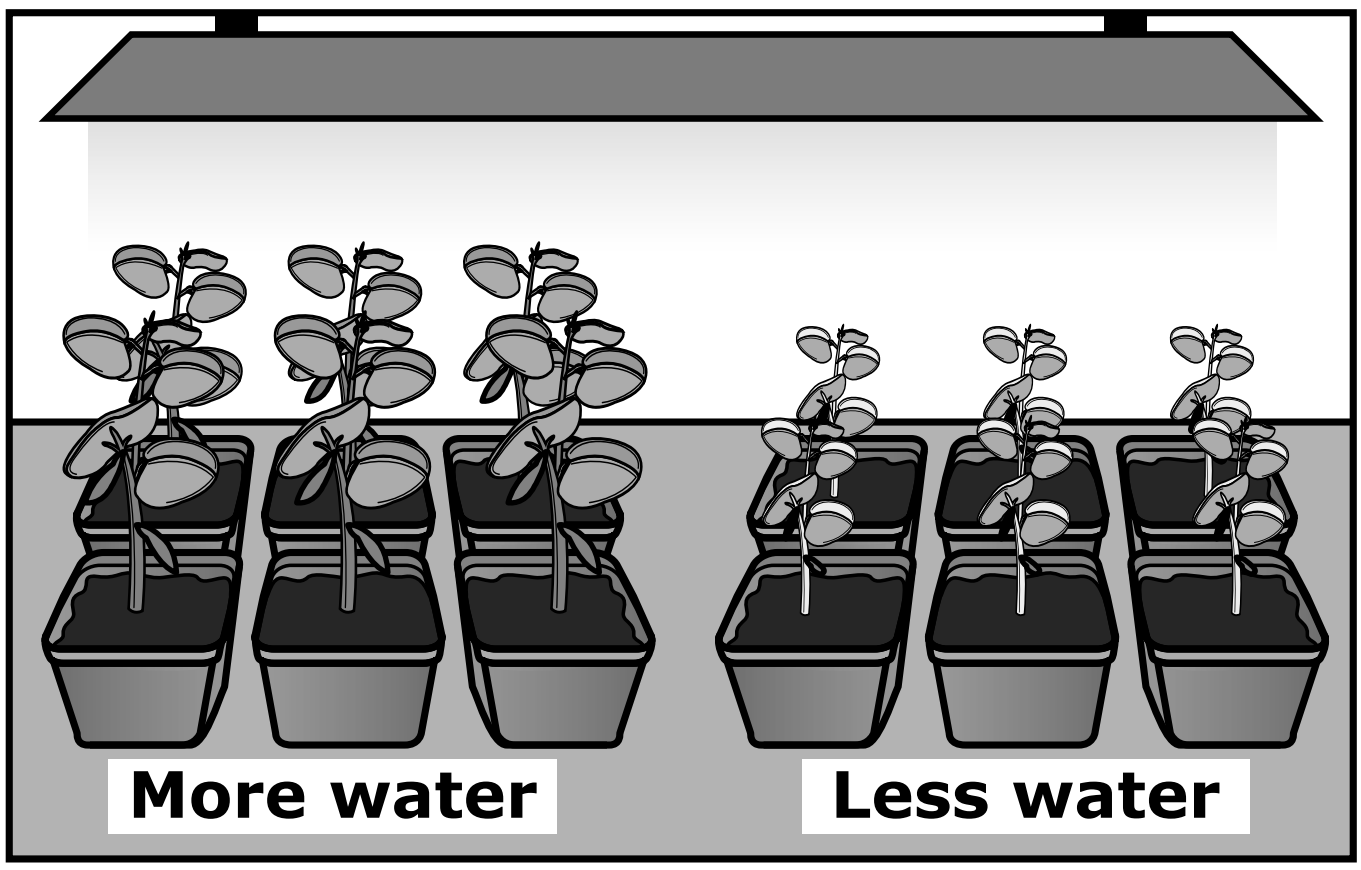
The student uses yellow pea seeds for a different experiment. The student divides these seeds into 2 groups. One group of yellow pea seeds receives half as much water as the other group. After 1 month, the group of plants that received less water is shorter than the other group of plants.

2

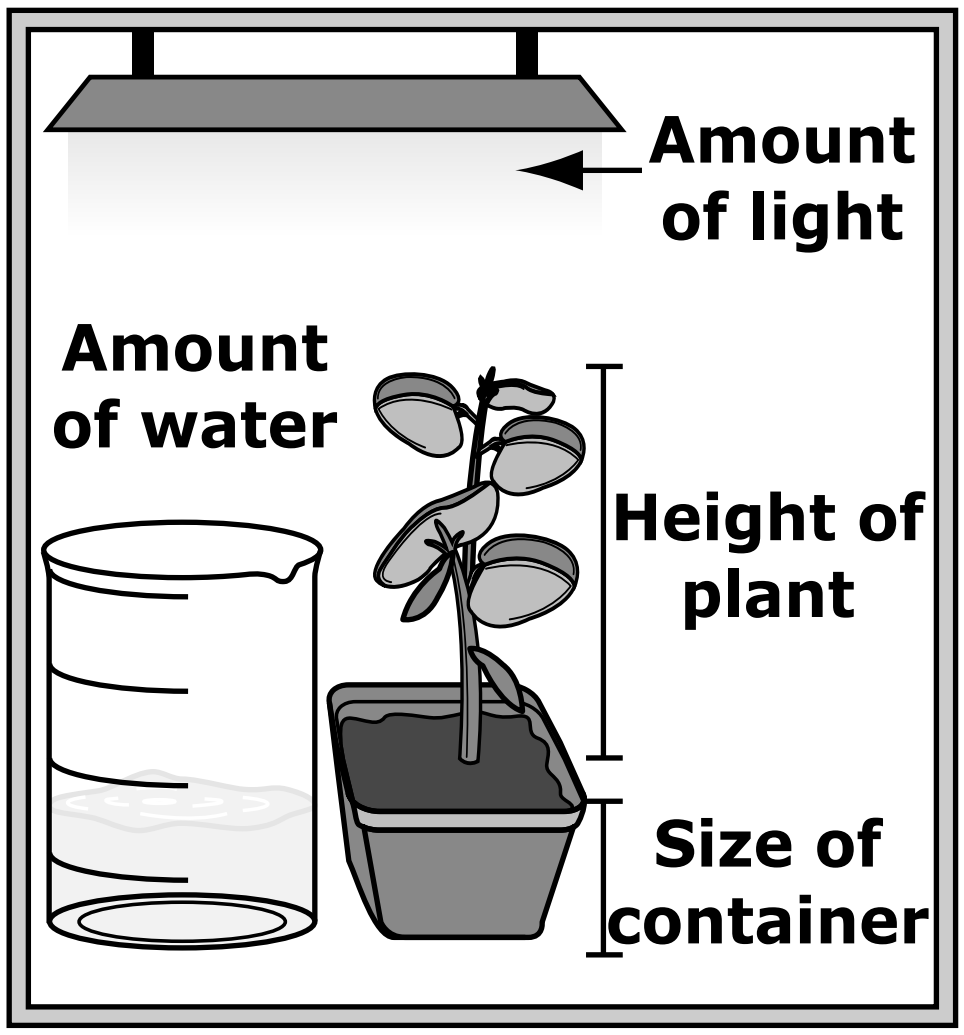


8. Several types of variables are found in this experiment. Identify each of the 4 variables shown as changed, measured, or kept the same.

Each variable is labeled A, B, C, or D. Write the letter of the correct variable or variables in each empty box. Use each letter 1 time.

Variable(s) Changed	
Variable(s) Measured	
Variable(s) Kept the Same	

Pea Plant Experiment



A.	B.	C.	D.
Amount of water	Amount of light	Height of plant	Size of container

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Satellites

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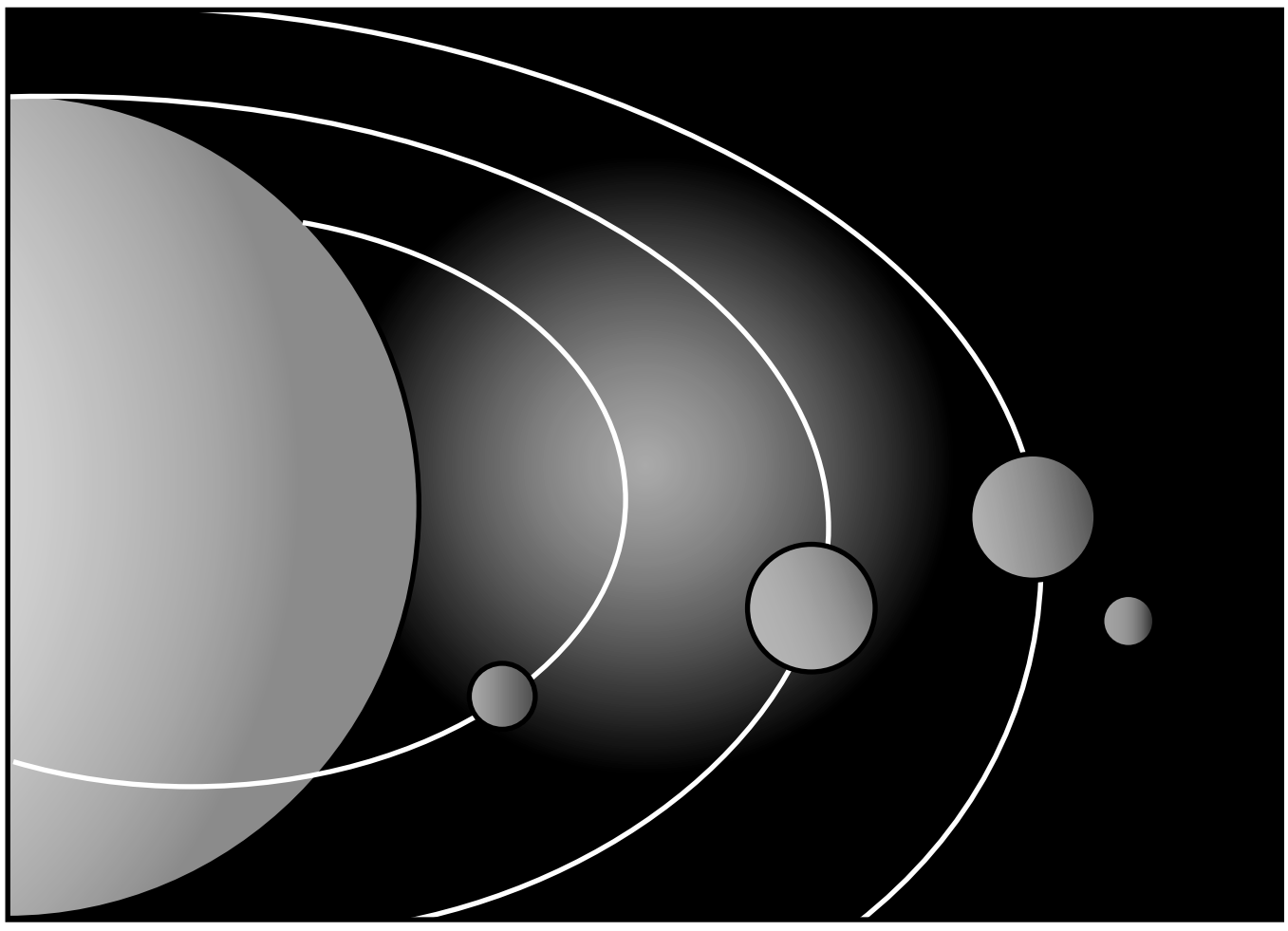
Satellites are natural or artificial objects that orbit a planet or star. The Moon and Earth are both natural satellites. For thousands of years, humans have used natural satellites and stars to determine the time of day and predict the change of the seasons.



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9. Satellites move in regular, predictable patterns. Identify which 2 properties keep satellites moving in regular, predictable patterns.

Circle 2 properties you want to select.

Properties

Density

Friction

Gravity

Inertia

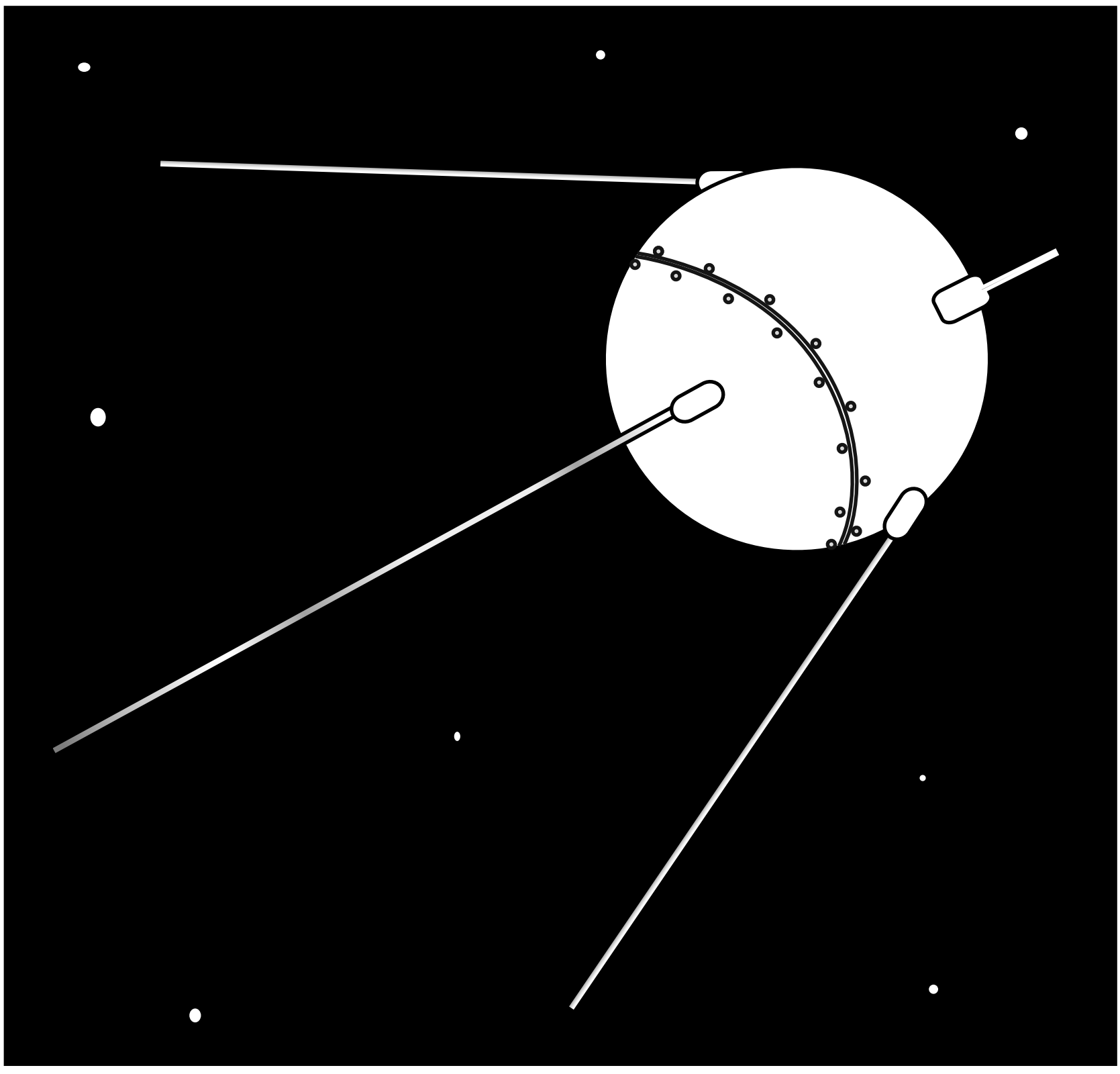
Magnetism

Speed

2

The first artificial satellite, Sputnik, was launched in 1957. Since then, many other countries, including the United States, have launched artificial satellites. These satellites are powered by an energy source such as batteries or the Sun.

Sputnik



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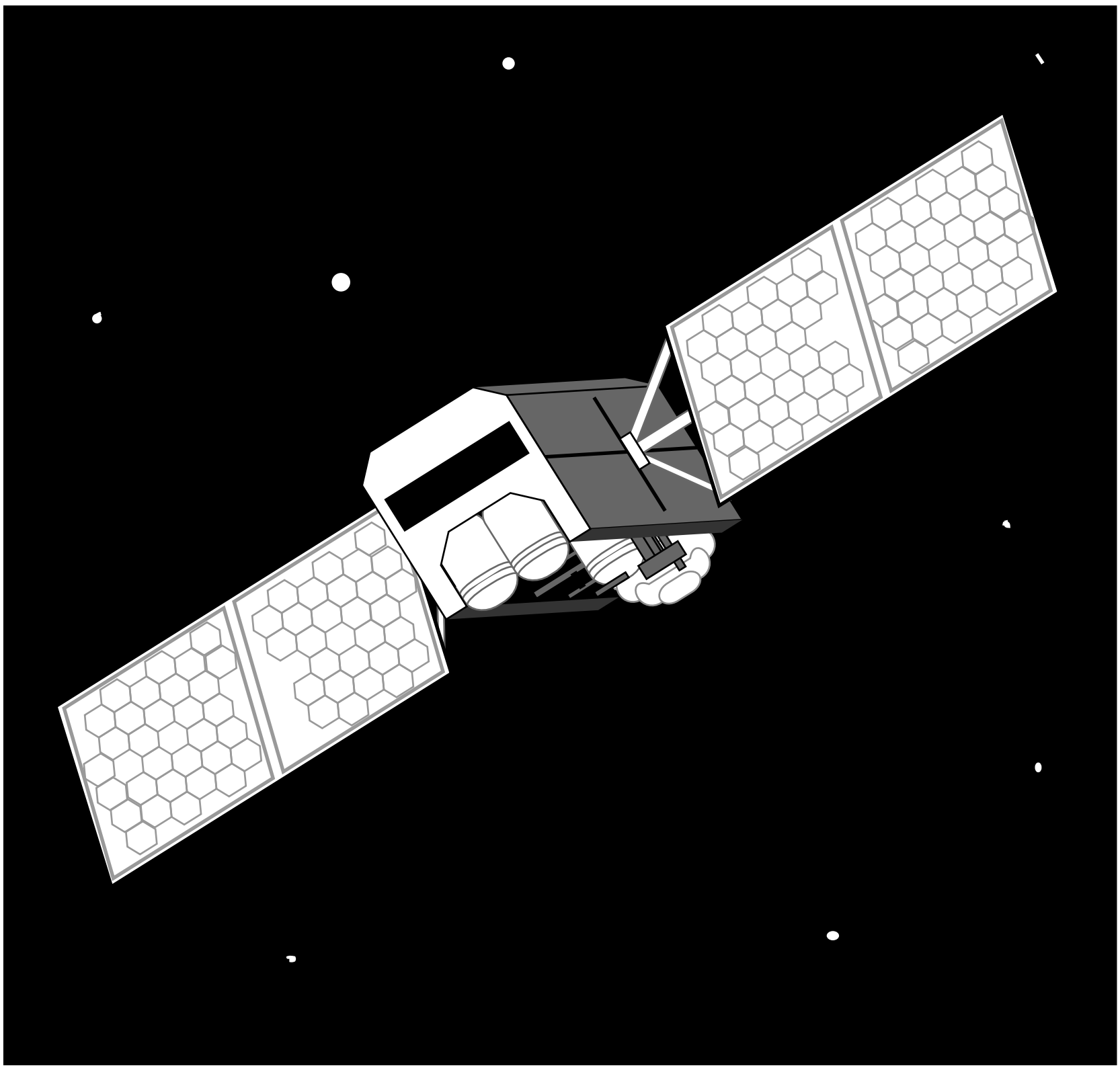
Modern Artificial Satellite



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10. Scientists use rockets to launch satellites from Earth. Identify which energy types are involved in launching a rocket.

Each energy type is labeled A, B, C, or D. Write the letter of the correct energy type in each empty box. Three of the energy types will be used.

2

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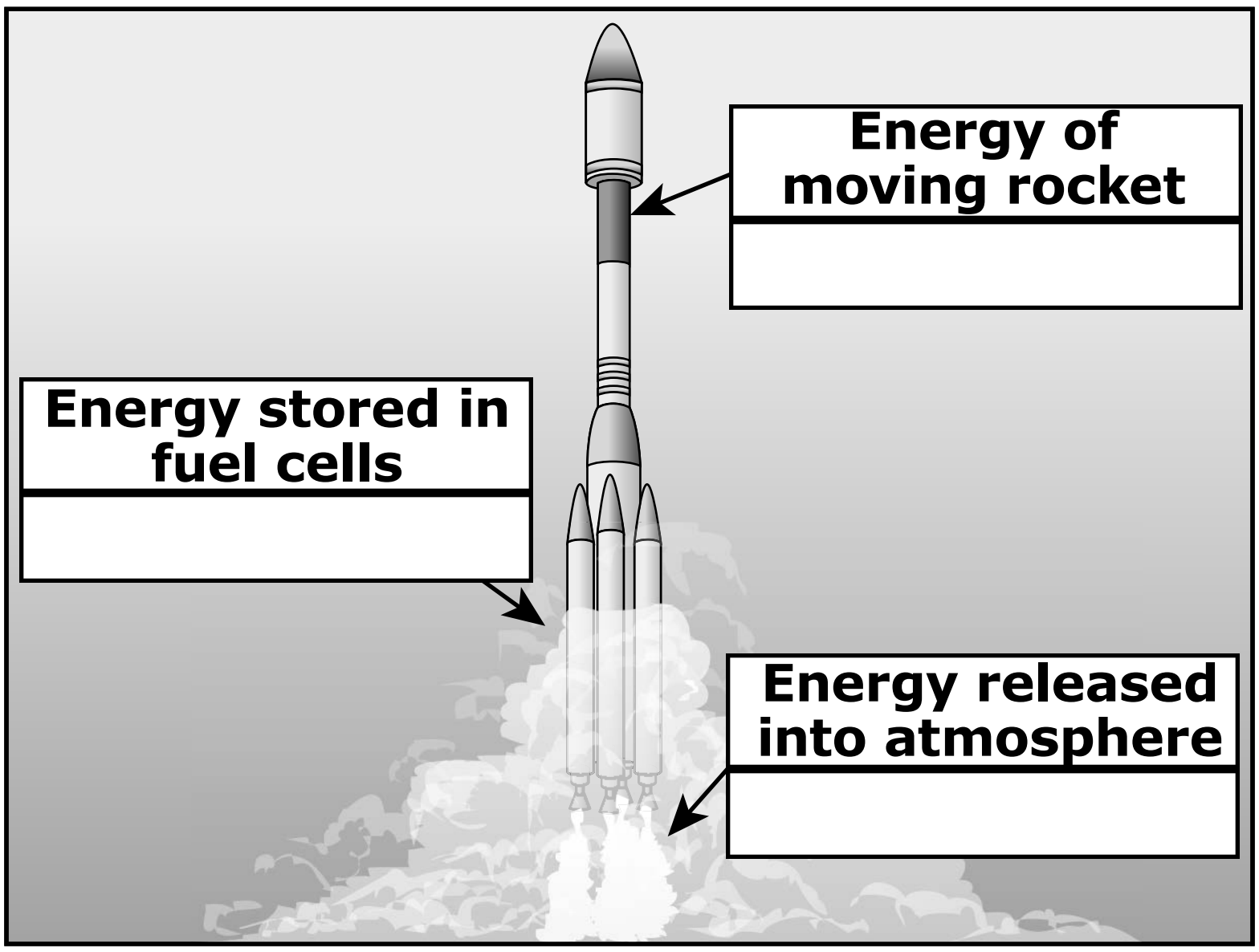
Launching a Rocket



Energy Types

A. chemical

B. electrical

C. heat

D. mechanical

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Scientific research also uses artificial satellites. Scientists use images from satellites to observe changes in the sizes of glaciers.

Satellite Image of Glacier, 1960

= Glacier

= Land

= Water

Go on to the next page.

Satellite Image of Glacier, 1980

= Glacier

= Land

= Water

Go on to the next page.

Satellite Image of Glacier, 2000

2

= Glacier

= Land

= Water

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11. The glacier in the satellite image appears white and the land appears brown. Which statement explains why objects appear to be different colors?

A. Objects reflect all wavelengths of light.

B. Objects refract all wavelengths of light.

C. Objects reflect some wavelengths of light and absorb others.

D. Objects refract some wavelengths of light and absorb others.

Go on to the next page.

12. As the glacier melts, the volume of water in the lake near the glacier increases. Every 3 square kilometers of ice that melts adds 1,000,000 liters of water to the lake.

Glacier Size Over Time

Year	1960	1980	2000
Area (km^2)	9	6	3

Assume the glacier melts at the same rate through 2020. Graph the volume of water in the lake from 1980 to 2020.

You can use the calculator to help you answer this question.

Write a "+" above each bar where the top of the bar should be.

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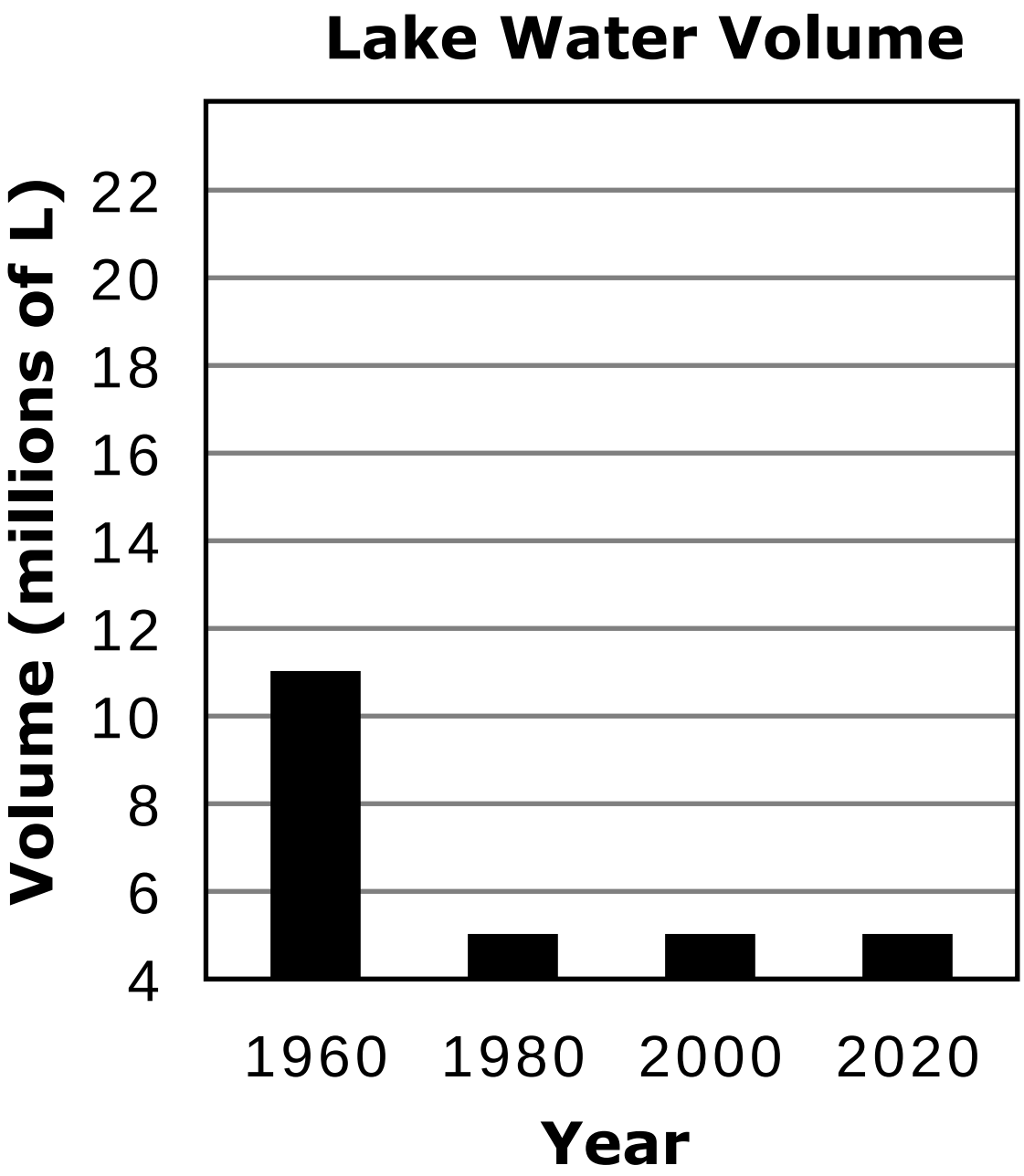

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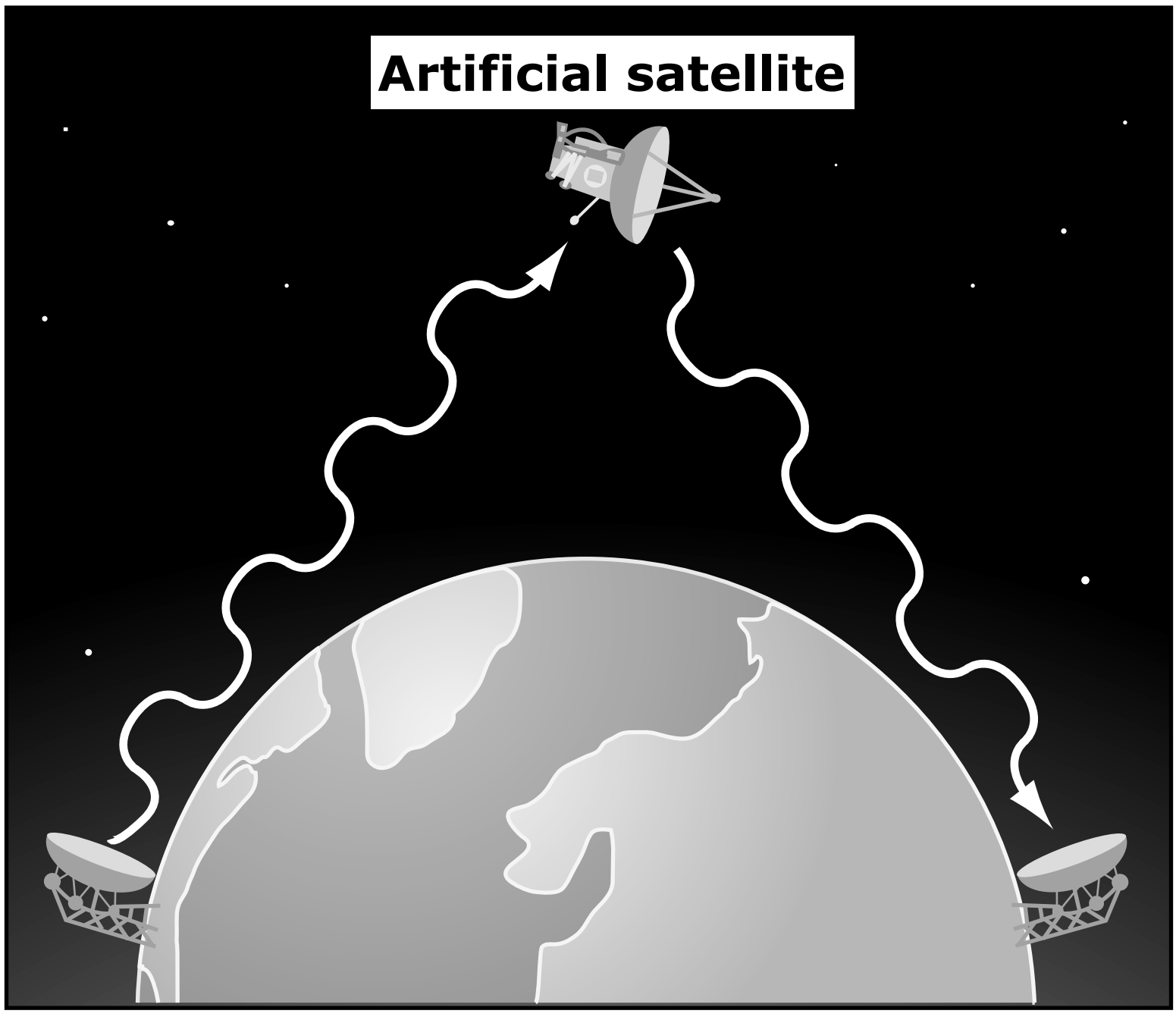
Communication is a common use of artificial satellites. They receive and send electromagnetic waves to transmit radio, telephone, and television signals.



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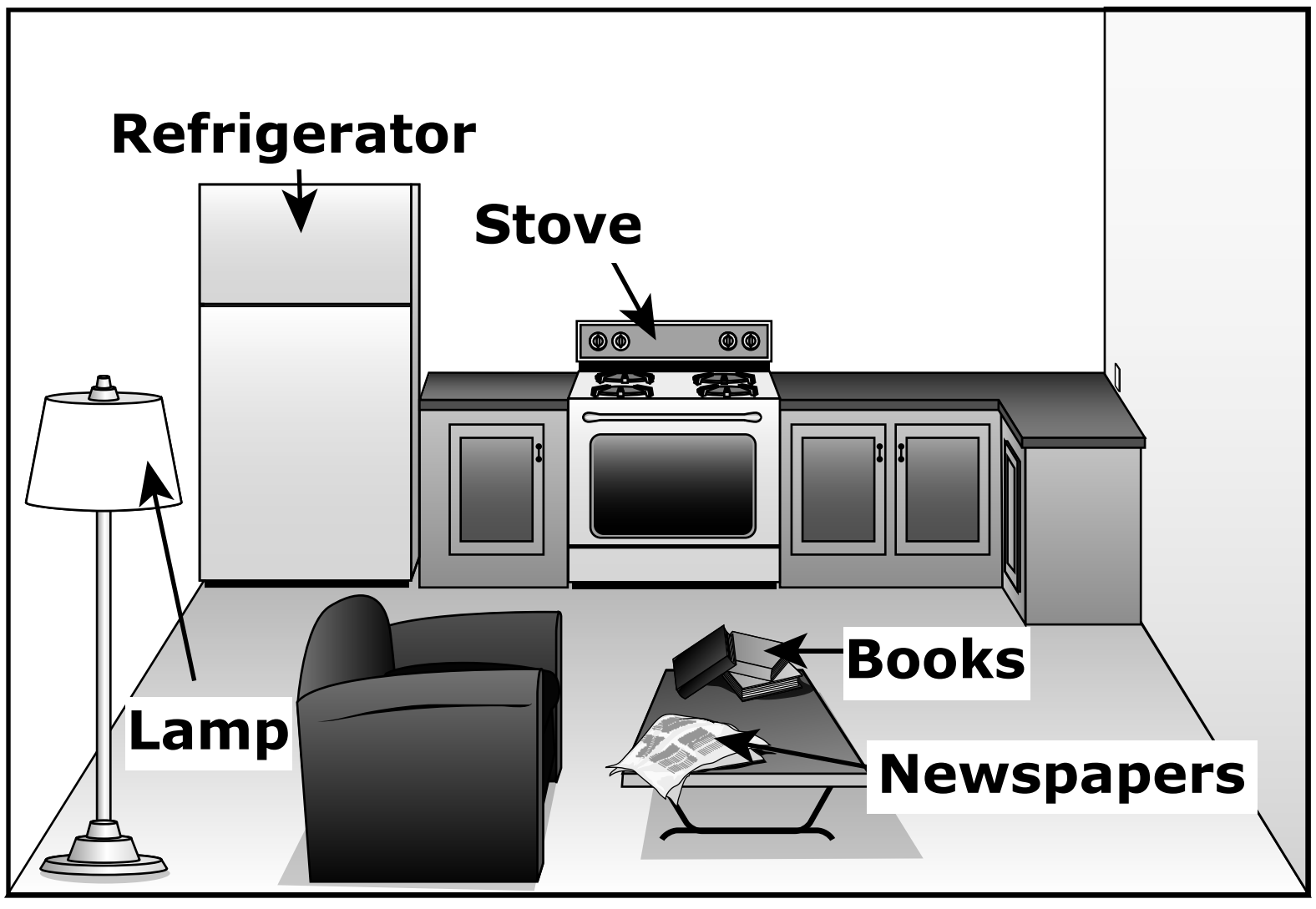
13. Internet services use satellite signals. People can use the Internet in homes to replace some older technologies. Identify which items people can replace by using the Internet.

Circle the names of the items you want to select.

Items



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14. Which statement describes why sound waves cannot travel beyond Earth's atmosphere to the satellites?

A. Sound waves need light to move.

B. Sound waves cannot travel in air.

C. Sound waves need particles to move.

D. Sound waves cannot travel fast enough.

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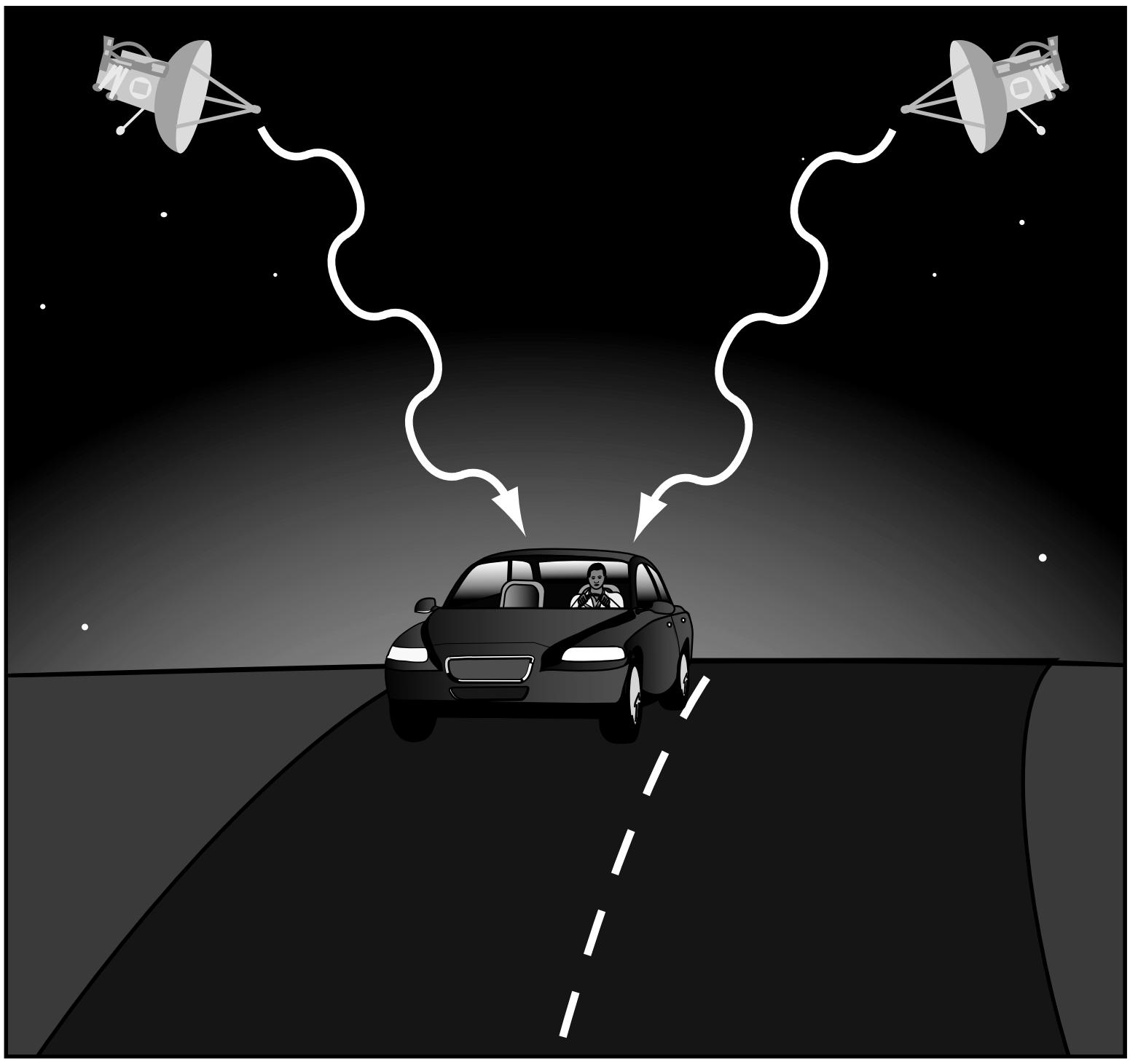
The global positioning system, known as GPS, uses artificial satellites. People can use a GPS device to get directions to a location.



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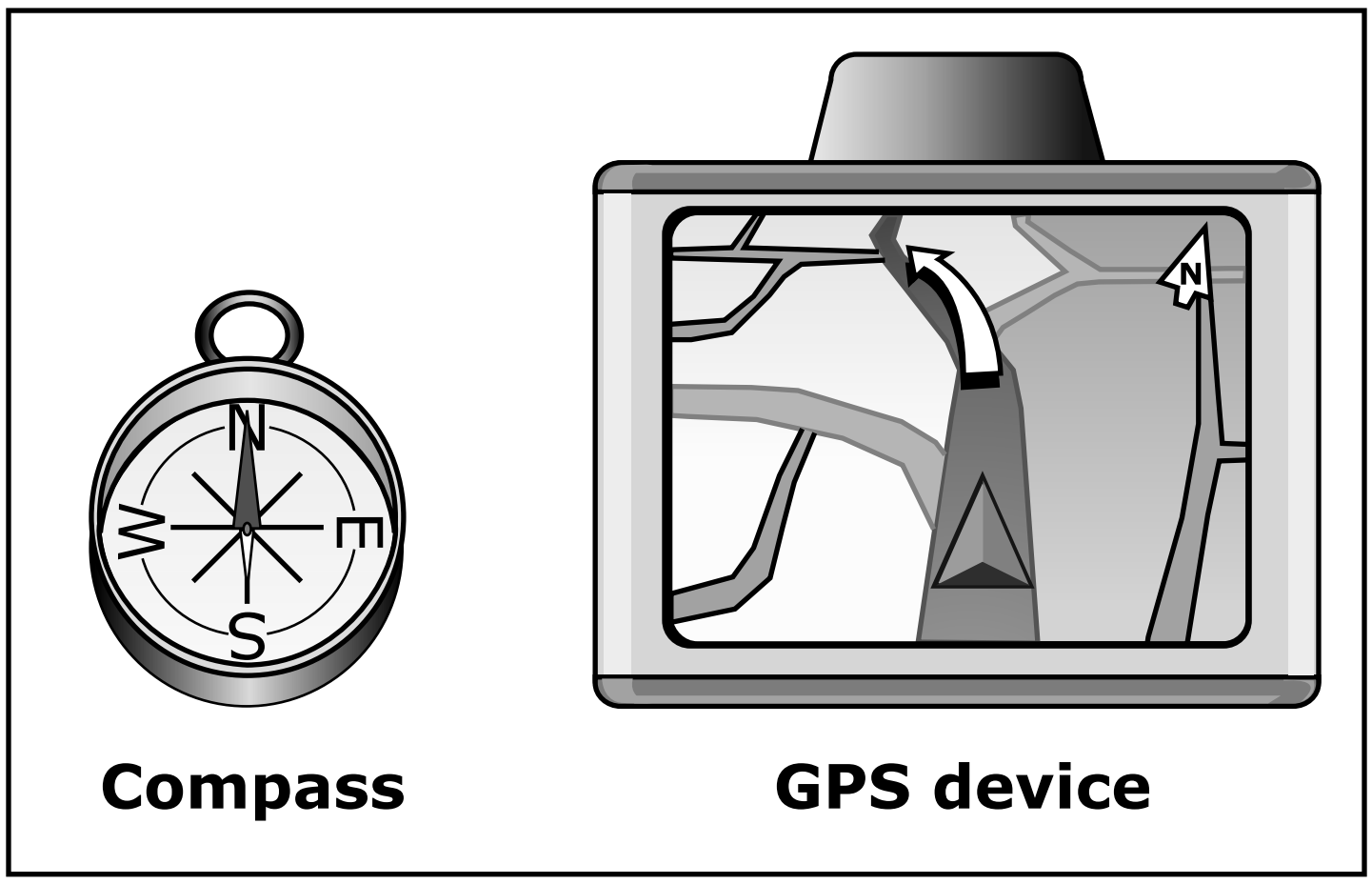
15. A compass and a GPS device have similar features and different features. Identify which features are similar and which are different.



Each feature is labeled A, B, C, or D. Write the letter of each feature in the correct box. You will use each letter 1 time.

A. Shows which direction is north

B. Cost

C. Number of functions

D. Includes a map

Similar	Different

This is the end of Segment 2.

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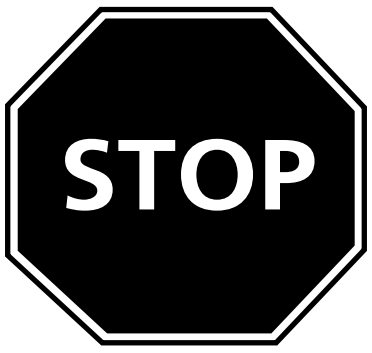

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Grade 8

Science Item Sampler

24 point

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