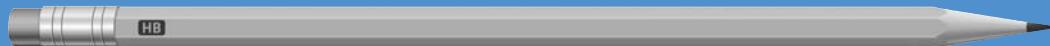


# Colorado Measures of Academic Success



# Grade 5 Science



Paper Practice Resource for Students



## **Paper Practice Resource for Students**

The Colorado Measures of Academic Success (CMAS) is Colorado's standards-based assessment program designed to measure the Colorado Academic Standards (CAS) in the content areas of science, social studies, English language arts, and mathematics. The sample items included in this resource provide students with an opportunity to become familiar with the format of test items that appear in the paper-based test books.

While the use of the sample items is not required, it is strongly encouraged to help ensure students are familiar with the types of items they may encounter while taking the paper-based test.

The sample item sets in the CMAS Practice Resources are not intended to be representative of a complete unit or test, nor are they intended to cover all assessed content or item types. To view assessment frameworks, high level blueprints, scoring rubrics, evidence statements and standards for the CMAS assessments, visit: [https://www.cde.state.co.us/assessment/cmas\\_testdesign](https://www.cde.state.co.us/assessment/cmas_testdesign).

### **Item Types:**

#### **Selected Response Items**

Selected response items are multiple choice questions. To respond, the student indicates their response by filling in the circle(s) next to their answer choice.

**Correct Mark:**

A  B  C  D

**Incorrect Marks:**

✓  ✗  ●  ○  E

#### **Constructed Response Items**

Constructed response items are questions or prompts that require an independent, written response. To respond, the student writes his or her answer in the response box in the test book.

## **Converted Online Technology-Enhanced Item Types**

Online technology-enhanced items converted to the paper testing format may ask students to:

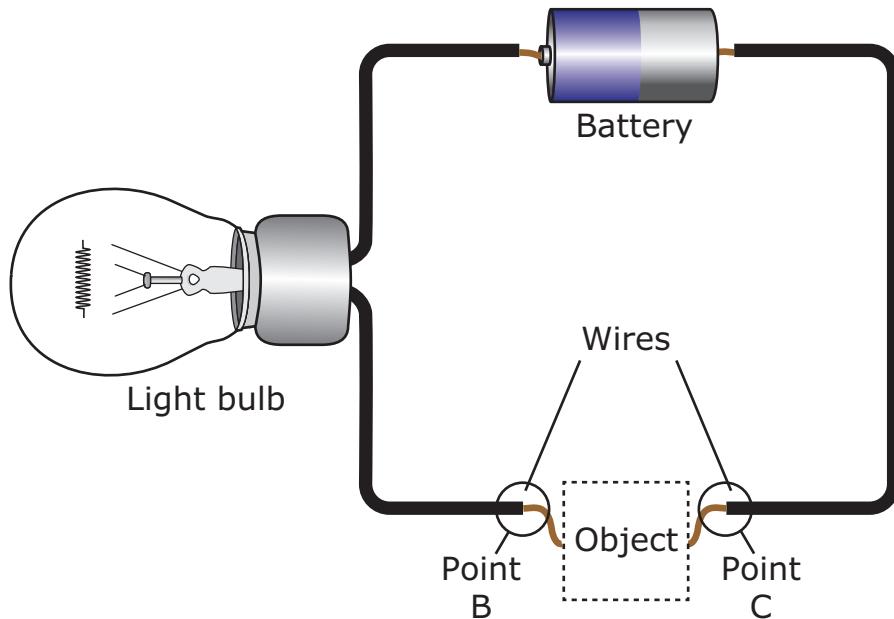
- Circle the correct answer
- Complete a table with checkmarks, Xs, or letters from a list of answer choices
- Fill in the blank
- Draw lines from boxes to correct answers
- Complete a bar graph or histogram

## **Clusters**

Clusters include groups of items that relate to a scientific topic. The information needed to respond appears before the associated items.

# **ITEM SET 1**

1. Students investigate a circuit. They observe that the light bulb only turns on when certain materials are placed between points B and C.



Using their observations, they separate the materials they are testing into two groups. The table shows their groupings.

### Materials

Group A	Group B
iron nail	rubber eraser
copper penny	plastic button
steel paper clip	wood stick

Circle **one** correct response from each box to complete the sentence.

The property the students tested was whether each material \_\_\_\_\_.

- conducts electricity
- conducts heat
- is magnetic

A comparison can be made between the penny and the paper clip to see which one is \_\_\_\_\_

- the better conductor
- more magnetic

by testing to see which one \_\_\_\_\_.

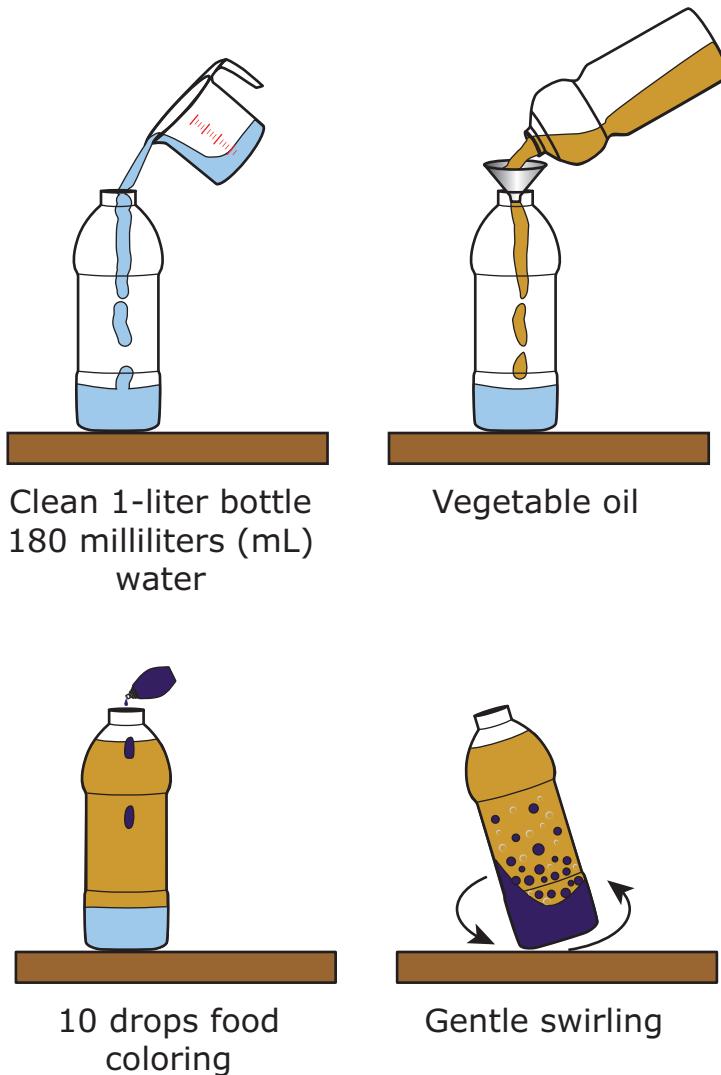
- makes the light shine brighter
- is more attracted to the wires

**Directions:** Use the information to answer questions 2 through 5.

### Part 1

A group of students observes behaviors of matter using vegetable oil and vinegar salad dressing. The students perform an investigation using similar substances.

**Figure 1: Science in a Bottle Setup**

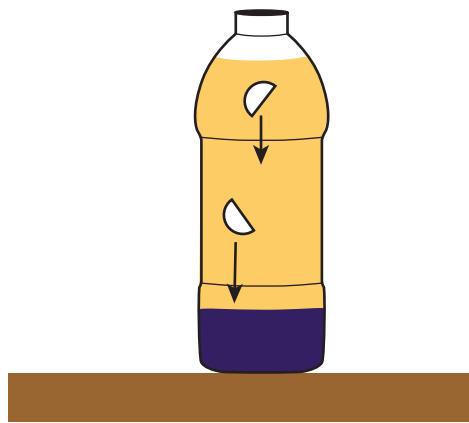


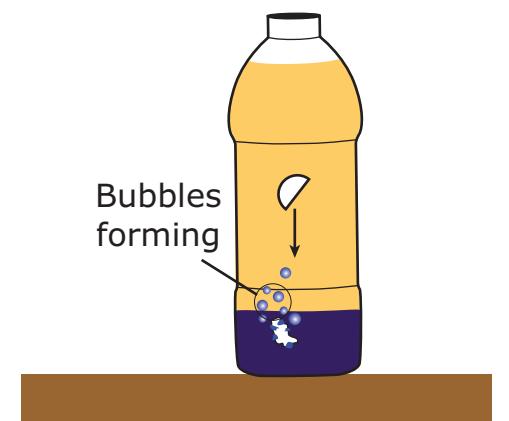
## **Part 2**

After the vegetable oil and colored water sit for 10 minutes, the bottle is ready for the investigation. The students have a tablet that fizzes in water. They break the tablet in half and drop the pieces into the bottle one at a time. The students then screw on the cap to seal the bottle.

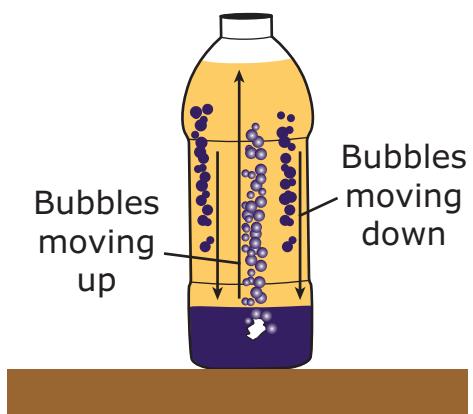
The students observe that the tablet pieces sink through the oil and dissolve in the colored water. As the pieces dissolve, bubbles form that move upward and rise to the top of the bottle. Some bubbles pop at the top, and then other bubbles move downward and sink.

**Figure 2: Science in a Bottle Investigation**





KEY	
	= vegetable oil
	= water and food coloring
	= broken piece of tablet
	= dissolving piece of broken tablet



- 2.** When someone shakes a container full of different objects, they may mix together. Objects that are similar in size mix the most. When some objects are smaller than others, the smaller objects usually sink below the larger ones.

The students plan to use a different set of materials to be models for the behavior of the oil and water used in Part 1. Which materials, if shaken, would **most** accurately be models for the behavior of the water and vegetable oil in the bottle?

(A)

Science in a Bottle Setup	Model
water	clear marbles
vegetable oil	yellow marbles

(B)

Science in a Bottle Setup	Model
water	salt
vegetable oil	yellow marbles

(C)

Science in a Bottle Setup	Model
water	clear marbles
vegetable oil	pepper

(D)

Science in a Bottle Setup	Model
water	pepper
vegetable oil	salt

- 3.** After the tablet in the investigation in Part 2 has completely dissolved, a student unscrews the cap to the bottle. As the cap loosens, the students hear a hissing sound. What is the **most likely** explanation for the hissing sound?
- (A) Small particles of gaseous matter exit the bottle.
  - (B) Small bubbles in the bottle turn back into water.
  - (C) The oil and water mix to form a single layer.
  - (D) The food coloring dissolves into the oil.

- 4.** Students repeat the investigation in Part 2, but this time they weigh the tablet as well as the bottle and its contents before and after the investigation. The students do not put the cap on the bottle after the tablet is added.

Which statement predicts what the students will observe in the investigation, and which description correctly explains their observation? Select **two** correct answer choices.

- (A) The mass of the bottle after the investigation was greater than the mass of the bottle and tablet before the investigation.
- (B) The mass of the bottle after the investigation was the same as the mass of the bottle and tablet before the investigation.
- (C) The mass of the bottle after the investigation was less than the mass of the bottle and tablet before the investigation.
- (D) This is evidence that no new substance was formed as the matter in the tablet was destroyed.
- (E) This is evidence that a new substance was formed and left the bottle as a gas.

- 5.** A bottle of water and a bottle of clear oil are on a table. The students notice that the liquid in the bottles looks the same.

Use the information in Part 1 to explain how a student can use food coloring to correctly identify the oil and the water. Your response should include a description of:

- how a student can use the way that food coloring behaves in water to identify a substance as water
- how a student can use the way that food coloring behaves in oil to identify a substance as oil

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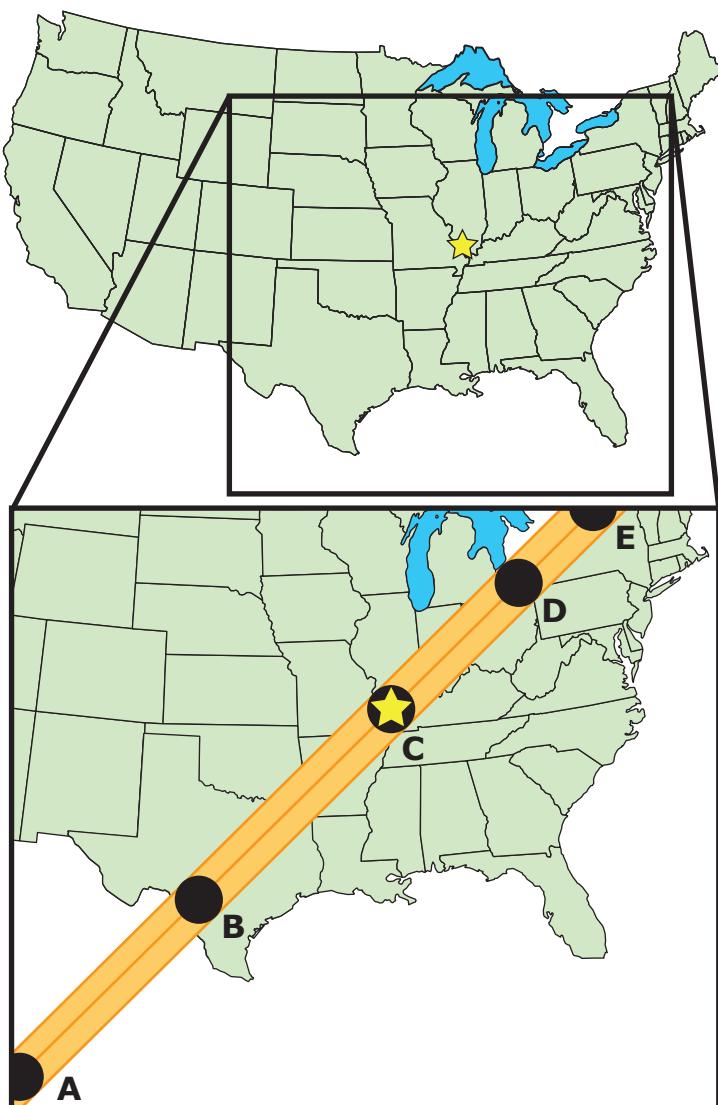
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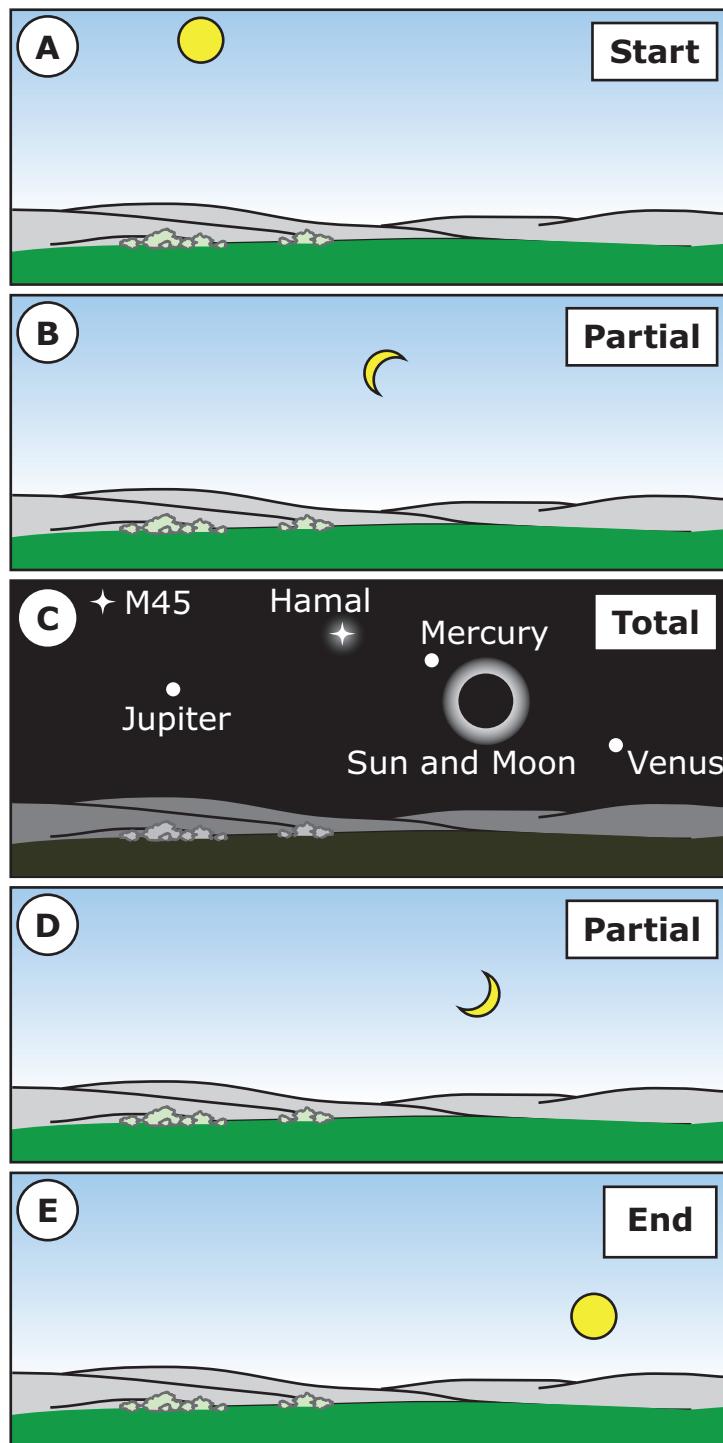
**Directions:** Use the information to answer questions 6 through 11.

Students researching the Sun, Earth, and Moon system read about eclipses and find information on a total solar eclipse that will occur in 2024. During a total solar eclipse, the light from the Sun is about the same as the light from a full moon. Since stars can be seen during a full moon, the students wonder whether stars will be seen during the total solar eclipse. This information shows what they learn from doing more research.

**Figure 1: Viewing Location and Path of the Total Solar Eclipse near the Center of the United States**



**Figure 2: Appearance of the Sky When the Moon's Shadow Is at Each Location**



### **Data Table**

<b>Event</b>	<b>Time</b>	<b>Stars Visible in Sky?</b>
start	2:00 p.m.	no
partial eclipse begins	2:42 p.m.	no
total eclipse begins	3:58 p.m.	yes
maximum eclipse	4:00 p.m.	yes
total eclipse ends	4:02 p.m.	no
partial eclipse ends	5:17 p.m.	no

- 6.** In the model of the eclipse, Jupiter, Mercury, and Venus are shown. Venus appears brighter than Mercury in the night sky. Using your knowledge of the factors that affect the brightness of objects, circle **one** correct response from each box to complete the sentences.

Objects that are \_\_\_\_\_ usually appear dimmer to a viewer

farther away  
 closer

than objects that are \_\_\_\_\_. This information supports the claim

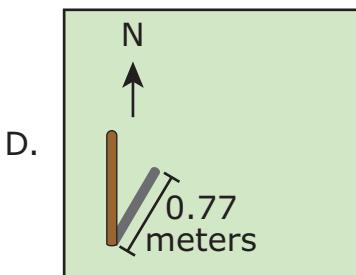
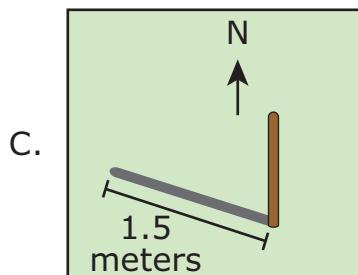
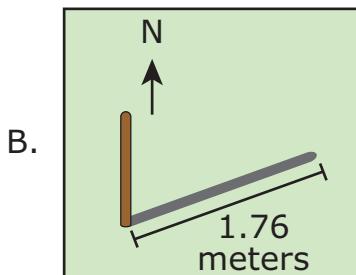
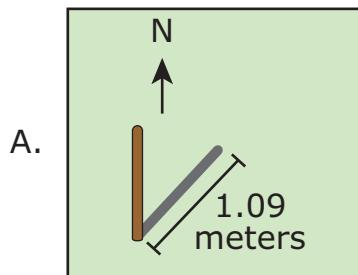
farther away  
 closer

that if Venus appears brighter than Mercury, then Venus is probably \_\_\_\_\_ Earth than Mercury is.

farther away from  
 closer to

7. Outside the path of the total solar eclipse, the pattern of shadows is the same as on any other day. Show how shadows change on the day of the eclipse for someone outside the path of the eclipse.

Based on the data table, write a letter from the list of shadow images in the correct box. Each shadow may be used once, more than once, or not at all.



Shadow when  
partial eclipse  
begins

Shadow during maximum eclipse

Shadow when  
partial eclipse  
ends

- 8.** The star M45 is visible during the total solar eclipse in the night sky in the Northern Hemisphere. If the same total solar eclipse would occur during the summer, M45 would not be visible. Why would M45 not be visible in the summer?
- (A) because M45 changes the amount of light it gives off during different seasons
- (B) because M45 moves closer to or farther from planets during different seasons
- (C) because Earth revolves around the Sun
- (D) because Earth rotates on its axis
- 9.** After observing the model of the eclipse, a student claims that the Sun is the closest star to Earth. Compare the brightness of the objects in the sky during the partial eclipse and the total eclipse to explain why the student's claim is correct. Your response should include:
- a comparison of bright objects seen during the partial solar eclipse and bright objects seen during the total solar eclipse
  - an explanation of why the differences in brightness support the student's claim

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**10.** Use the model to observe and compare how each star looks during the total solar eclipse. Your response should include:

- how the appearances of the stars compare to each other
- how comparing the stars provides evidence for the distances of stars from Earth

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- 11.** A student wonders whether the stars he saw during the total solar eclipse in the model would be the same stars he could see twelve hours later. Explain how the sky and the stars that are seen would change over twelve hours. Your response should include:

- a description of how the sky and the stars the student could see would look different
- why the sky would look different

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**Directions:** Use the information to answer questions 12 through 16.

### Part 1

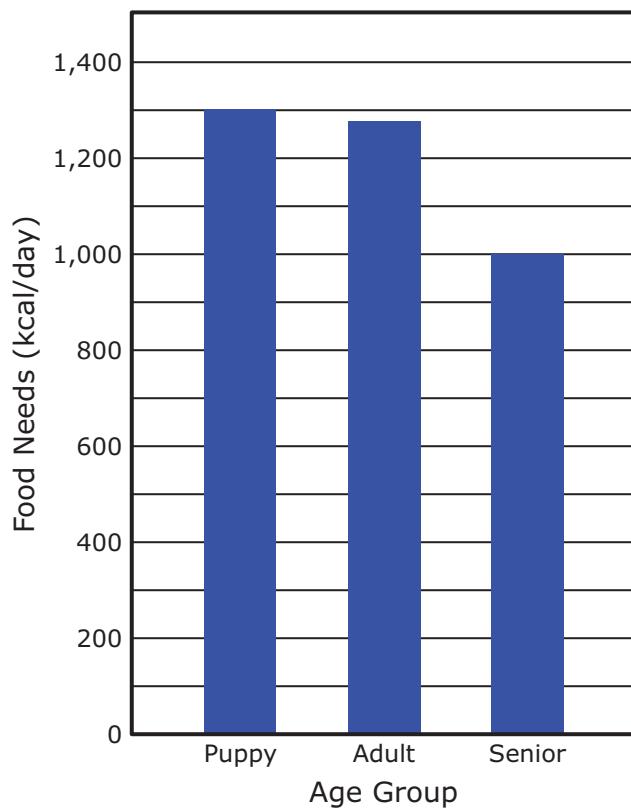
Two dogs eat different amounts of food. Dog 1 is larger than Dog 2, and Dog 1 eats less food than Dog 2. A student wonders why this happens. The student finds a scientific study about the amount of nutrients dogs need from food, measured in a unit called kilocalories (kcal), per day. The student finds this information for different sizes of dogs and different ages of dogs.

Table 1 and Figure 1 show the data the student finds.

**Table 1: Different Dog Sizes and Food Needs**

<b>Size of Dog</b>	<b>Food Needs (kcal/day)</b>
giant ≥ 40 kg	3,020
large 20–39 kg	1,784
medium 6–19 kg	1,036
small ≤ 5 kg	206

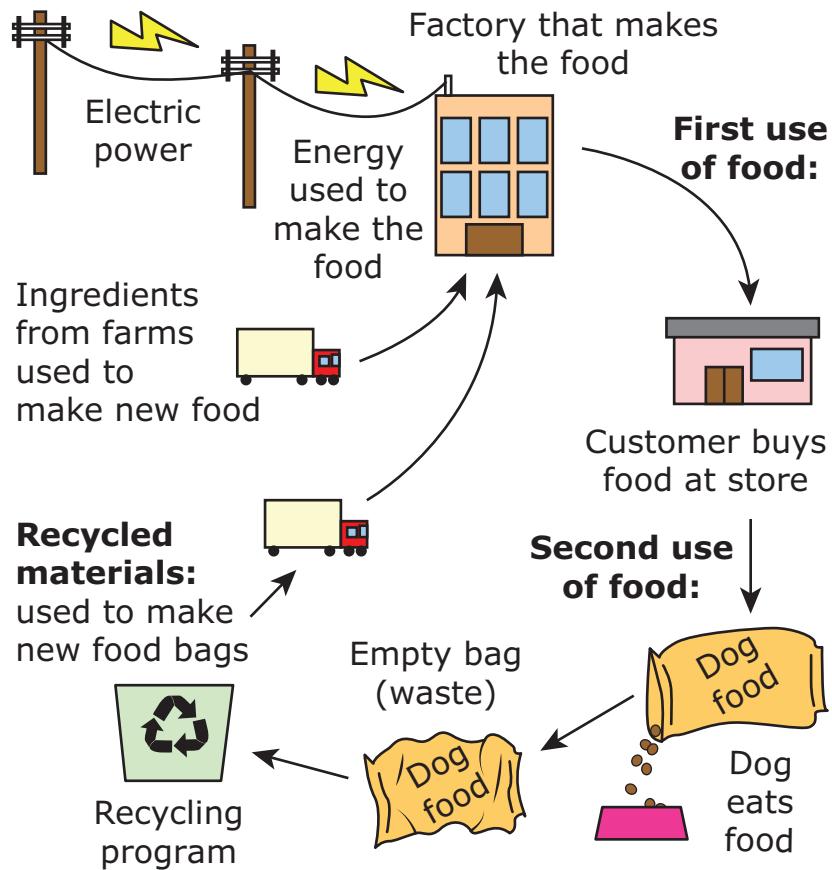
**Figure 1: Food Needs Based on Age of Dog**



## Part 2

The student learns more about the way dog food is made and used. The information reminds the student of an ecosystem. A teacher begins to make a diagram using the information to model an ecosystem.

**Figure 2: Model of an Ecosystem Using Dog Food**



**12.** Based on the information in Table 1, which claim is supported?

- (A) Medium-sized dogs use more energy from the Sun than small-sized dogs use.
- (B) Medium-sized dogs use more energy from water than giant-sized dogs use.
- (C) Large-sized dogs use more energy from the Sun than giant-sized dogs use.
- (D) Large-sized dogs use more energy from water than small-sized dogs use.

**13.** The student finds that two medium-sized dogs require different amounts of food to maintain a healthy weight. Dog 1 requires 1,050 kcal/day, and Dog 2 requires 900 kcal/day.

Based on Figure 2, compare the energy use of the dogs. Circle one correct response in each box to complete the sentences.

Dog 1 consumes more kilocalories per day than Dog 2. The energy Dog 1 consumes from the food \_\_\_\_\_.

originally came from the Sun  
was once matter in the soil  
used to be electric power

Dog 1 is most likely \_\_\_\_\_ than Dog 2.

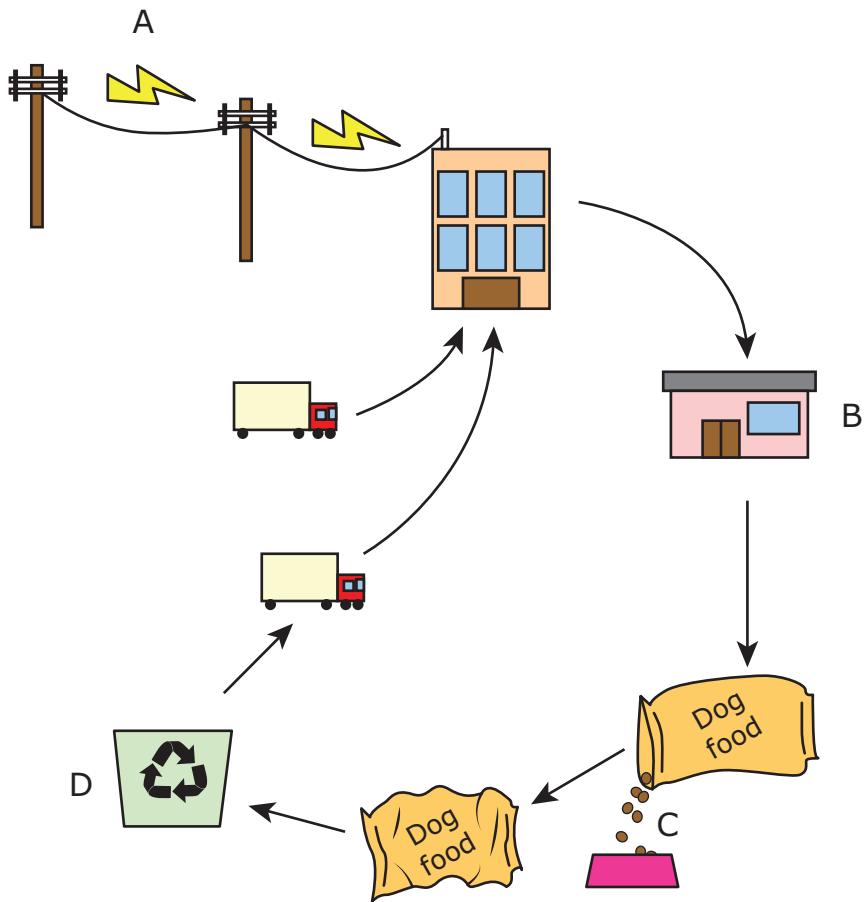
older  
younger

**14.** Which statement is one way the model in Part 2 shows matter moving in an ecosystem?

- (A) The truck moving ingredients from the farm is like decomposed matter moving from soil to plants.
- (B) The truck moving recycled materials is like decomposed matter moving from soil to plants.
- (C) The truck moving ingredients from the farm is like energy traveling from the Sun to plants.
- (D) The truck moving recycled materials is like energy traveling from the Sun to plants.

**15.** One part of the dog food ecosystem model represents the Sun's energy.

Using the information in Part 2, circle the letter for the part of the model that represents the Sun's energy.



**16.** Using the information in Part 2, explain decomposition in the ecosystem model. Your response should include:

- which part of the ecosystem model represents decomposers
- an explanation of why this part of the model represents decomposers

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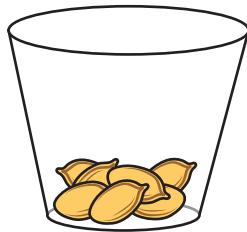
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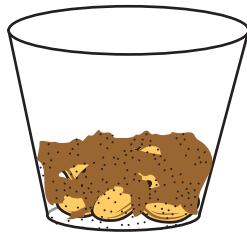
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- 17.** A student wants to see where seeds grow best. The student puts seven seeds in each of three cups and places the cups near an open window. The seeds in Cup A are left to dry. The seeds in Cup B are in dry soil, and the seeds in Cup C are wrapped in a cloth soaked with water.



Cup A,  
dry seeds



Cup B,  
seeds put in  
dry soil



Cup C,  
seeds wrapped  
in a cloth  
soaked in water

Explain what the student will observe after four days. Your answer should include:

- the changes observed in each cup after four days
- the reason for the changes observed in each cup

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**This is the end of Item Set 1.**

