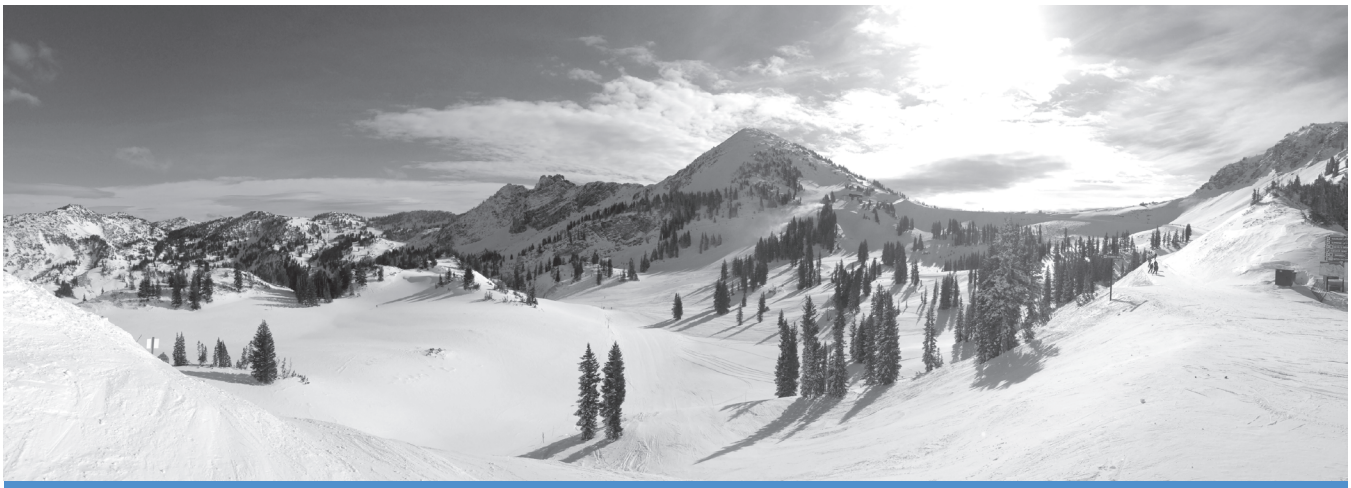
Colorado Measures of Academic Success



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.

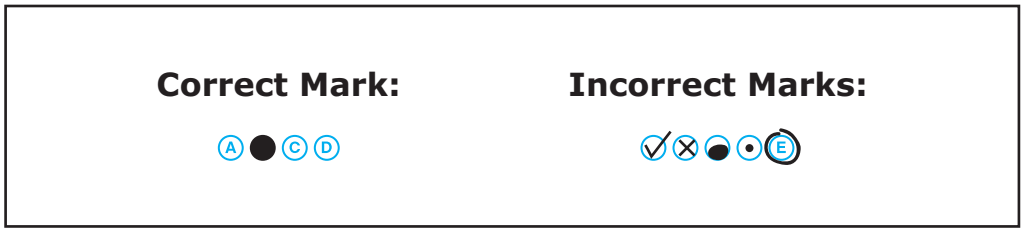
While the use of the sample items is not required, it is strongly encouraged to help ensure students are familiar with the types of items they may encounter while taking the paper-based test.

The sample item sets in the CMAS Practice Resources are not intended to be representative of a complete 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.

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.



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:

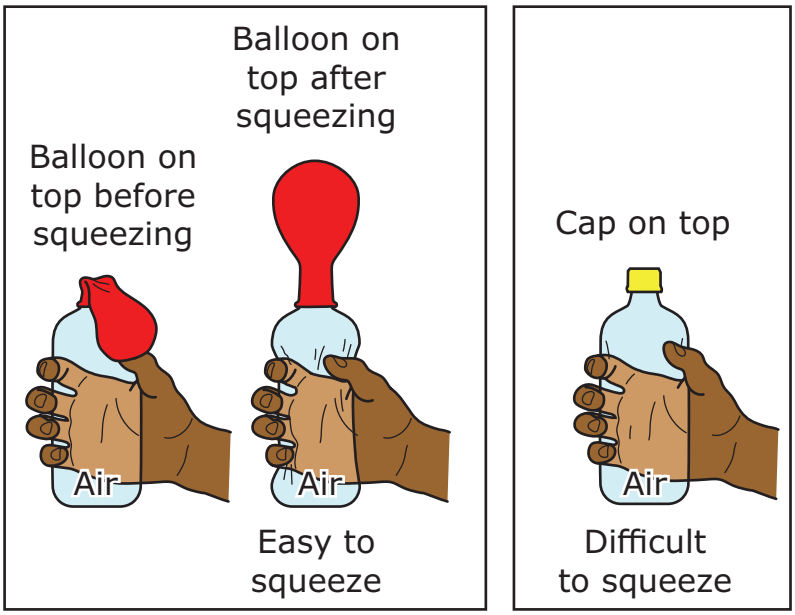
- Circle the correct answer
- Complete a table with checkmarks, Xs, or letters from a list of answer choices
- Fill in the blank
- Draw lines from boxes to correct answers
- Complete a bar graph or histogram

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. A student investigates matter by using two identical plastic bottles. The student seals one bottle with a balloon and the other bottle with a cap. The student squeezes each bottle with the same amount of force, as shown in the diagram.



Which **two** statements correctly explain the student's results?

Ⓐ The bottle with the balloon is easy to squeeze because tiny particles of matter that make up the air inside the bottle can move into the balloon.

Ⓑ The bottle with the cap is difficult to squeeze because the cap causes tiny particles of matter in the sides of the bottle to harden.

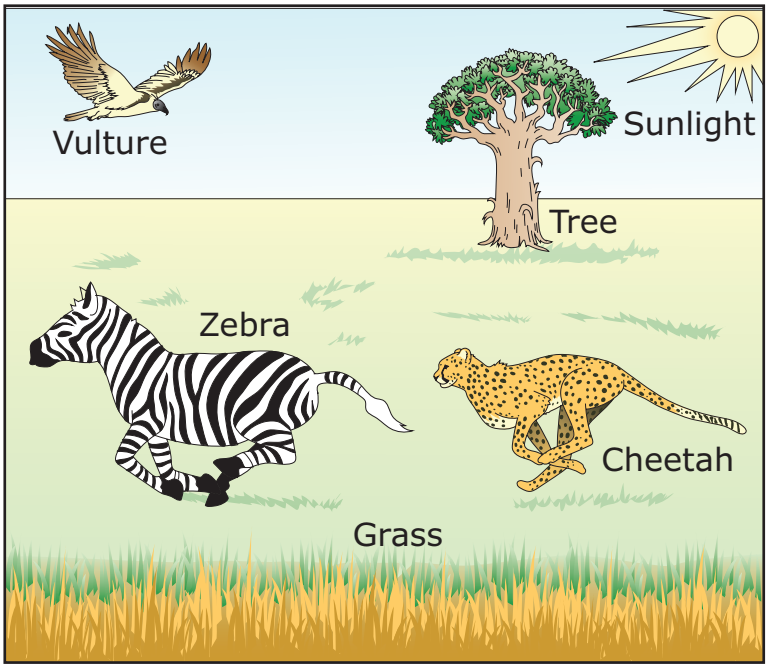
Ⓒ The cap holds in tiny particles of matter that take up space and fill the bottle, making it difficult to squeeze the bottle.

Ⓓ The balloon applies force to the tiny particles of matter inside the bottle, so less force is needed to squeeze the bottle.

Ⓔ The balloon allows space for tiny particles of matter to move as they become larger, so the bottle is easy to squeeze.

2. Zebras live in grassland ecosystems.

A Grassland Ecosystem



Where do zebras obtain the energy they need to escape predators, such as cheetahs?

Ⓐ directly from the Sun by absorbing light energy and storing it as food energy

Ⓑ indirectly from cheetahs who put pressure on the zebras to run faster

Ⓒ by eating grass that originally receives energy from the Sun

Ⓓ by eating other animals that prey on cheetahs

Directions: Use the information to answer questions 3 through 7.

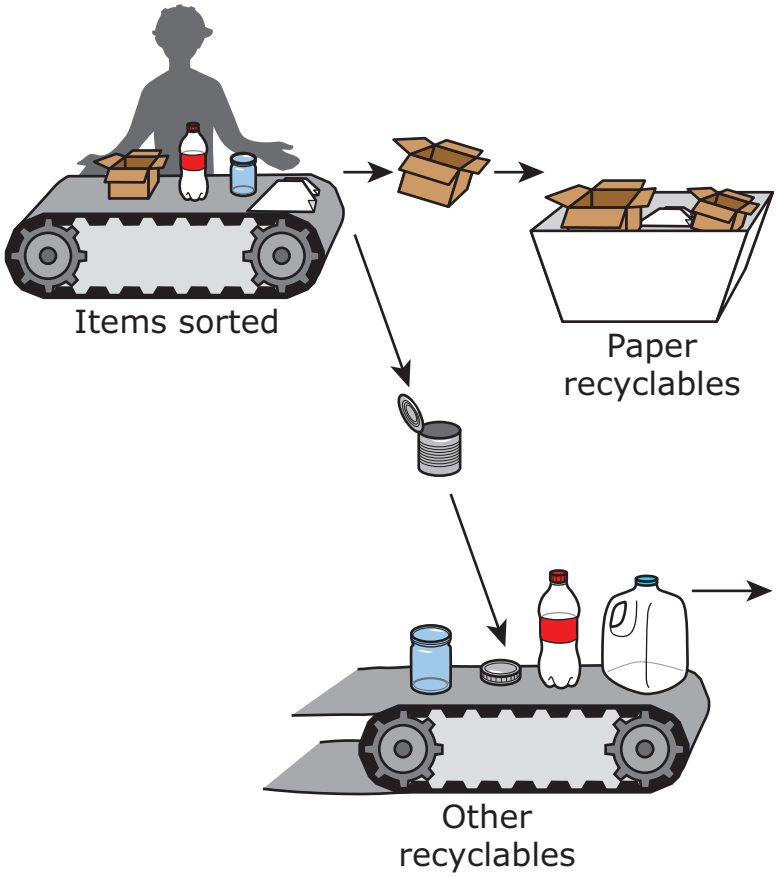
Part 1

Students notice that there are many types of items mixed together in a recycling bin. They investigate how a recycling facility separates the items.

Students learn that after workers collect the mixed items, the items are sorted according to their properties.

Figure 1 shows the major steps for sorting items.

Figure 1: Sorting Items



Students learn that trash, or anything that cannot be recycled, is sent to a landfill to be buried or is burned at a separate facility.

Students collect data about recyclables and trash for several states. They record the average recyclables and trash, in kilograms (kg), that these states collect each day, per person.

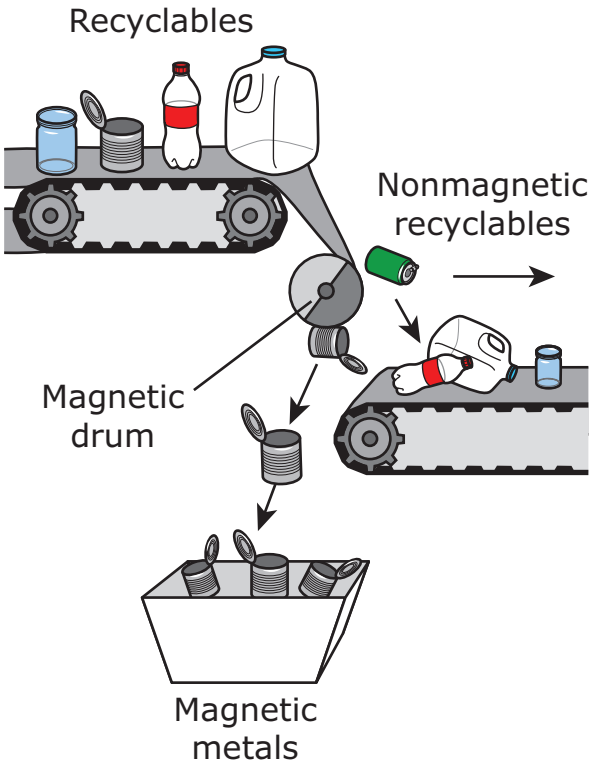
Average Recyclables and Trash Collected in Four States Each Day, per Person

State	Total Waste (kg per day)	Recyclables (kg per day)	Trash (kg per day)
Colorado	3.13	0.5	2.63
Minnesota	2.59	1.18	1.41
Nevada	3.49	0.77	2.72
Oregon	3.36	1.36	2.0

Part 2

Students learn about machines that are used to sort materials for recycling. Figure 2 shows a magnetic drum that rotates to pull out metal recyclables.

Figure 2: Using Magnets to Remove Metals

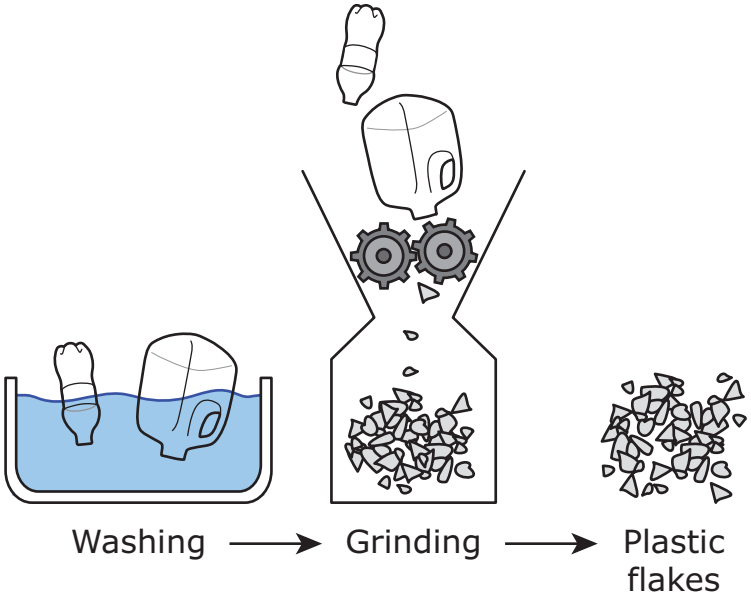


Part 3

Students investigate what happens to the recyclable plastic after it is sorted. They find out that recycled plastic can be made into clothing.

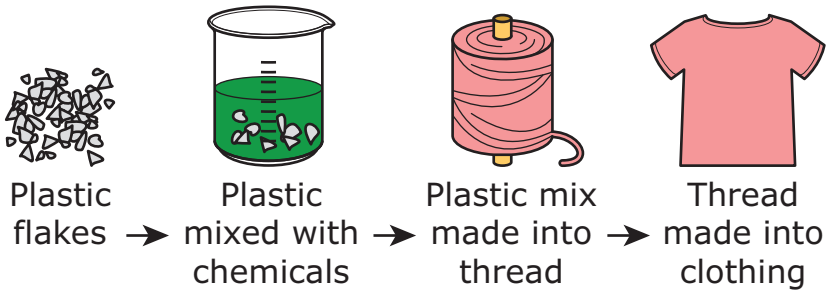
Plastic needs to be washed and ground up by large machines and changed into plastic flakes.

Figure 3: Making Plastic Flakes



The plastic flakes are mixed with chemicals, melted, and then used to produce new items, such as fabric.

Figure 4: Making Clothing from Plastic Flakes



3. In the state of Colorado, there was an increase in recycled paper on the last day of the school year. A student wonders how the increase in recycled paper changed the total waste produced per person for that day. Which sentence **best** explains a property of matter that would explain the change observed?

Ⓐ The total mass of matter cannot be calculated because the mass of the recyclables has changed.

Ⓑ The total mass of matter does not change because the mass of the trash did not change.

Ⓒ The total mass of matter decreased because the mass of the trash increased.

Ⓓ The total mass increased because the mass of the recyclables increased.

4. A student wants to identify the step when the recycled plastic changes to fabric during the recycling process.

During which step shown in Figure 3 and Figure 4 is a new substance formed?

Ⓐ weaving the thread into cloth to make clothing

Ⓑ melting the plastic to make thread

Ⓒ mixing the plastic with chemicals

Ⓓ grinding the plastic into flakes

5. While observing the sorting process in Part 2, the students found that 8 cans were sorted into the bin and 33 items were not.

Consider how the property of a material helps sort metal cans.

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

The students found that _____ of the recyclables had magnetic

8
33
41

properties because magnets _____ magnetic metals.

attract
repel

6. While studying the recycling process shown in Part 3, a student wonders whether a new material was formed at the end of each process in Figure 3 and Figure 4.

Circle one correct response from each box to complete the sentences.

The plastic flakes formed at the end of Figure 3 _____ a new

are not
are

material because their properties are _____ the recyclable

different from
the same as

plastic. The fabric formed at the end of Figure 4 is _____ material

not a new
a new

because its properties are _____ the plastic flakes.

different from
the same as

7. While observing the recycling process shown in Figure 1, a student wonders what types of forces move the items from the top belt to the lower belt. Explain how items from the top belt fall to the lower belt. Your response should include:

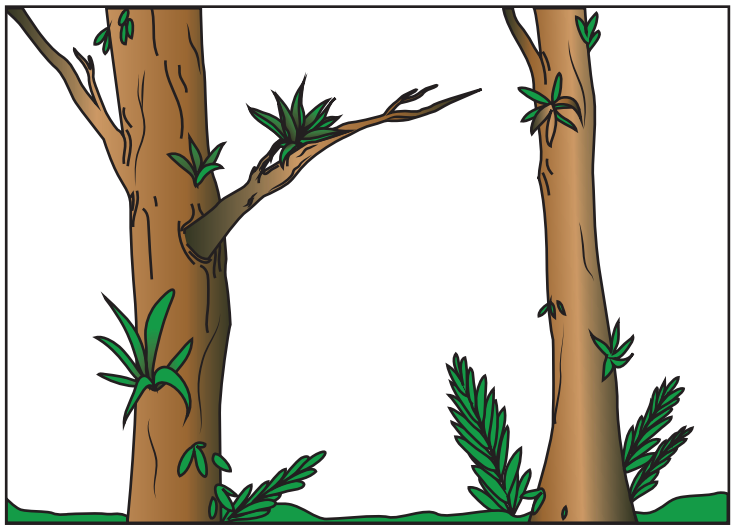
- identification of the force that causes the items to fall to the lower belt
- a reason that supports the identification of the force

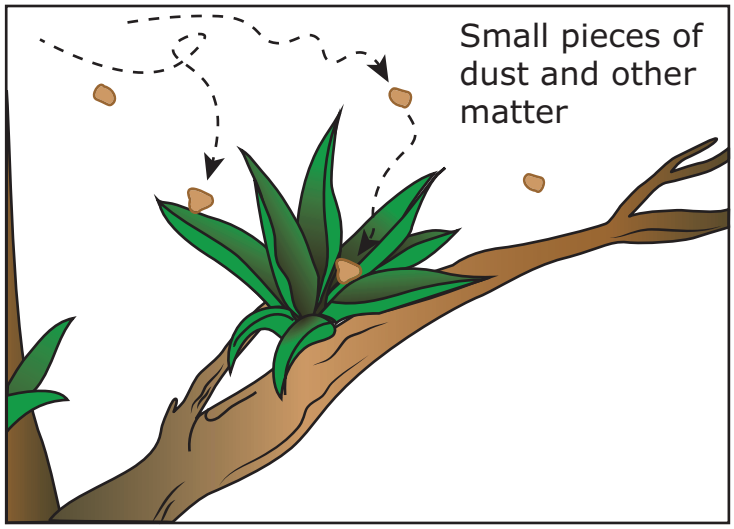
Directions: Use the information to answer questions 8 through 13.

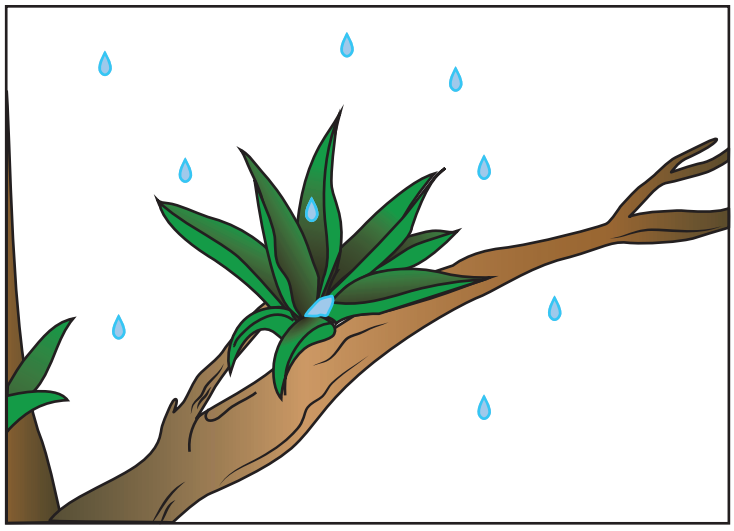
Epiphytes are a type of plant that can survive and grow without any soil. These plants grow on tree trunks, limbs, and branches, but their roots do not grow into the tree. This model shows how epiphytes get the nutrients they need to grow and survive.

Part 1

The pictures show an epiphyte growing on a tree. Small pieces of dust and other matter fall into the epiphyte. Raindrops that fall on its leaves also move into the plant.

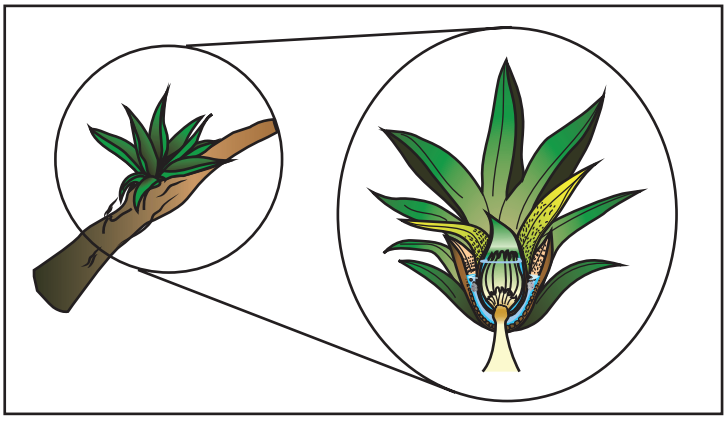



Small pieces of dust and other matter



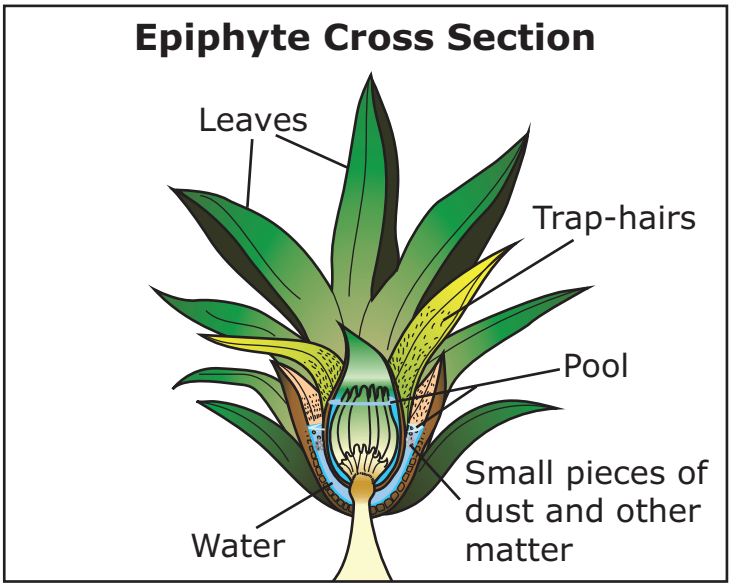
Part 2

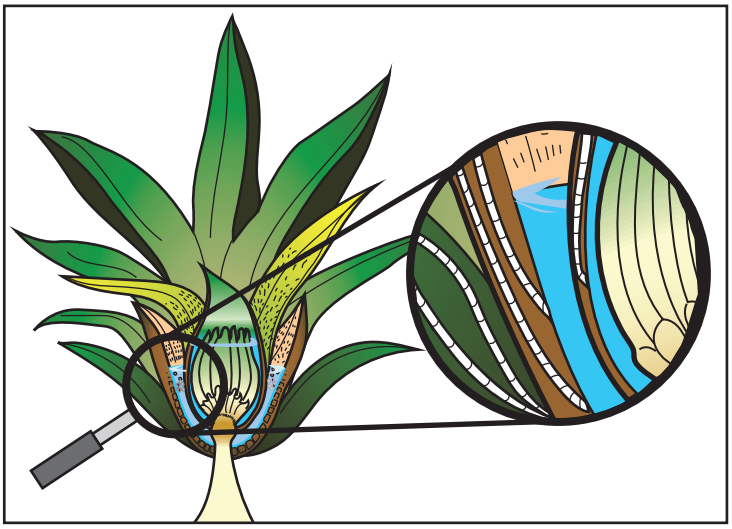
This picture shows a cross section of an enlarged view of the epiphyte.

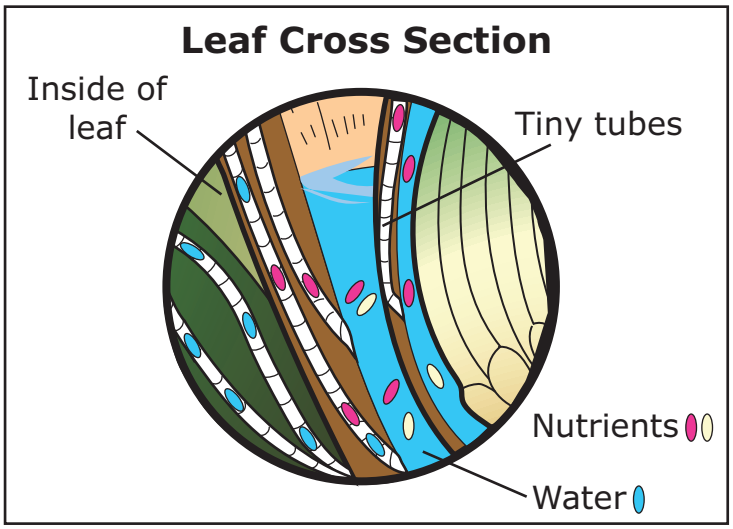


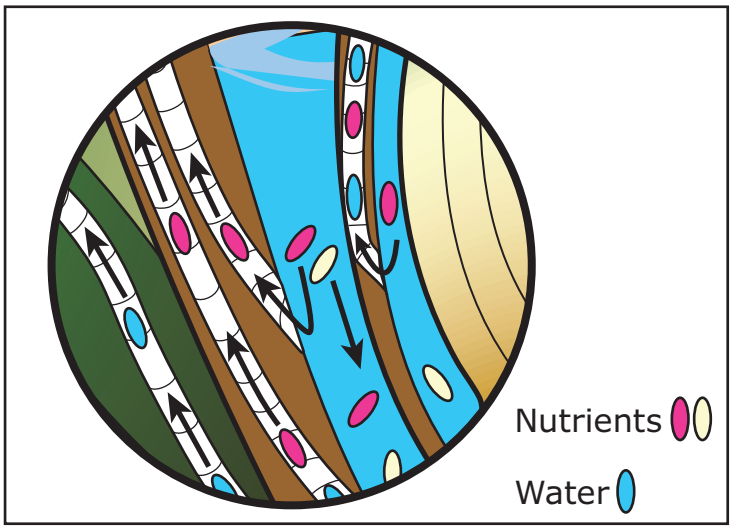
Part 3

The pictures show a cross section of the epiphyte and a cross section of its leaf. The arrows show that nutrients and water move through the plant.






Leaf Cross Section
Inside of leaf
Tiny tubes
Nutrients
Water


Nutrients
Water

8. A student studies the passage and makes a list of observations of what the epiphyte uses for growth. Use the information in the passage to identify whether each observation is correct or incorrect.

Place a check mark (✔) to select an answer in each row. Select **one** box per row.

Observation	Correct	Incorrect
Water used by the epiphyte comes from the atmosphere.	☐	☐
Nutrients used by the epiphyte are dissolved in water.	☐	☐
Water used by the epiphyte comes from the tree.	☐	☐
Water used by the epiphyte comes from the soil.	☐	☐

9. Look at Part 3. A student claims that the epiphyte benefits when an insect decomposes after falling into the epiphyte's pool.

Which statement **best** evaluates the student's claim?

Ⓐ The claim is incorrect because the decomposition of the insect will consume nutrients from the epiphyte's pool.

Ⓑ The claim is correct because the decomposition of the insect will release nutrients into the epiphyte's pool.

Ⓒ The claim is incorrect because the decomposition of the insect will poison the epiphyte.

Ⓓ The claim is correct because the decomposition of the insect will cause a bad smell.

10. A student claims that epiphytes can only grow in very dusty environments.

Why is the student's claim incorrect?

Ⓐ A dusty environment lacks nutrients.

Ⓑ A dusty environment lacks sunlight.

Ⓒ A dusty environment lacks fresh air.

Ⓓ A dusty environment lacks rain.

11. There are two epiphytes of the same species, age, and size growing on a living tree branch. A student removes one epiphyte and puts it on a dead, fallen tree branch. Describe the likely effect of location on the growth of the two epiphytes. Your response should include:

- a description of the materials that the two epiphytes need for growth
- an explanation of why the growth of the epiphytes **is** likely to be different or why their growth **is not** likely to be different

12. Most epiphytes live in tropical rain forests. Tropical rain forests experience more clouds, fog, and rain than other habitats. Using the model in Part 1, explain why tropical rain forests are the most suitable location for epiphytes. Your response should include an explanation of:

- why most epiphytes live in tropical rain forests
- how the weather in tropical rain forests affects the growth of epiphytes

13. A student claims epiphytes can grow without soil because epiphytes get everything they need from sunlight. Explain why the student's claim is incorrect. Your response should:

- explain why sunlight alone is not enough for an epiphyte to grow
- describe evidence from the passage that supports your answer

14. A student plans to create a model showing one example of how Earth's atmosphere interacts with the geosphere.

Which model would **best** demonstrate this interaction?

Ⓐ a clay mountain with cotton balls at the top representing clouds

Ⓑ a fan gently blowing across a tray containing soil and rocks

Ⓒ water being poured over a pile of sand

Ⓓ plastic ducks floating in a tray of water

This is the end of Item Set 1.

ITEM SET 2

1. A student places two seeds on a wet sponge. The student adds water to the sponge each day. After three days, the student observes a root growing out of one seed.

Which claim does this evidence support?

Ⓐ Plants can grow if they have fertilizer and air.

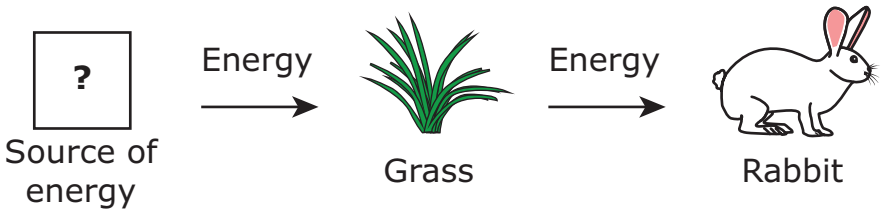
Ⓑ Plants can grow if they have air and water.

Ⓒ Plants need soil and fertilizer to grow.

Ⓓ Plants need soil and water to grow.

2. Rabbits eat grass. A teacher makes an incomplete model to show the transfer of energy in the rabbit's food.

Energy in a Rabbit's Food



To complete the model, show where the energy comes from. Your answer should include:

- what the student should put in the box to complete the model
- an explanation of how energy is transferred from the source in the box to the rabbit

Directions: Use the information to answer questions 3 through 7.

Students wonder why ocean water is salty. Figure 1 shows two rivers that flow from snowy mountains to the ocean.

Figure 1: Stages of Rivers

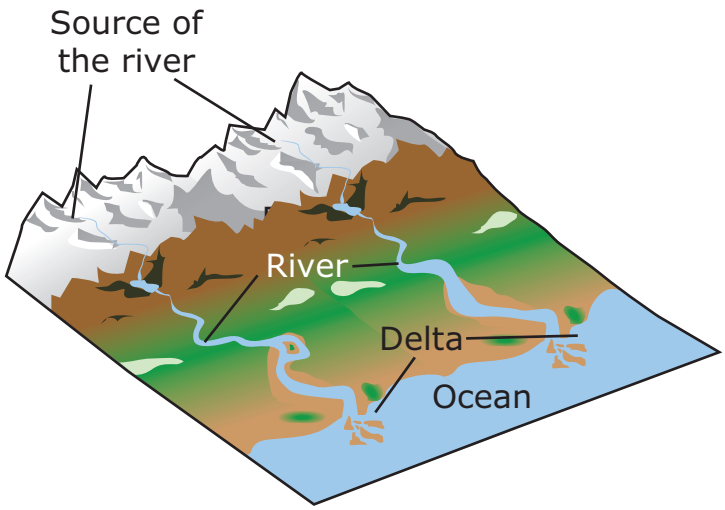
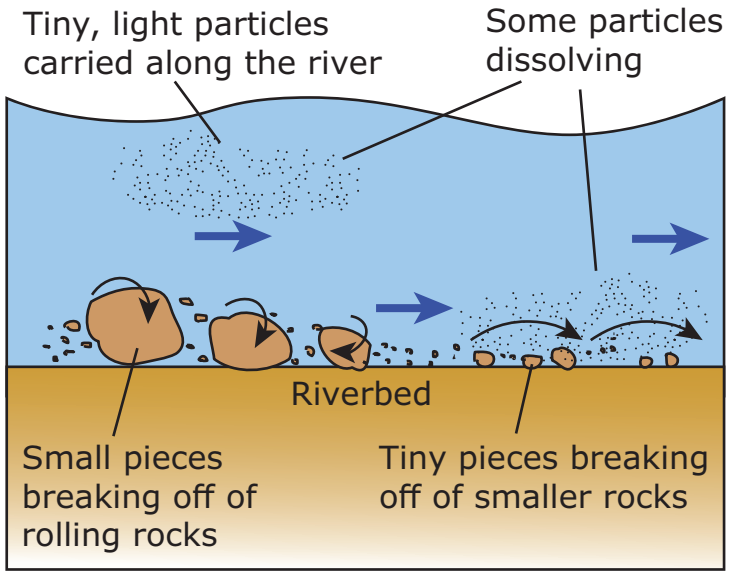


Figure 2 shows how rocks in a river release salt as the river flows toward the ocean.

Figure 2: Rocks Releasing Salt into the River



A small amount of salt dissolves in each of Earth’s rivers, but not enough to turn the rivers into salt water. The salt in all of Earth’s rivers collects in the ocean over time, so the oceans become salty while river water stays fresh.

The students also learn that humans use river water for drinking, watering crops, generating electricity, and transportation.

3. Based on the information provided, complete this explanation about the source of the two rivers.

Circle one correct response from each box to complete the sentences.

The source of the two rivers is a _____. This type of

glacier or ice cap
hot spring
waterfall

source is the _____ source of _____ on Earth.

biggest
smallest

groundwater
fresh water
salt water

4. A student claims that a force moves the water away from the source of the river. Based on the model in Figure 1, which statement describes the student's claim?

Ⓐ The claim is incorrect because forces do not affect the movement of the water.

Ⓑ The claim is correct because air pressure resists the movement of the water.

Ⓒ The claim is correct because the force of gravity pulls the water downward.

Ⓓ The claim is incorrect because the weight of the water pushes it upward.

5. Ocean water is considered to be salt water because ocean water has 3.5% salt.

Circle one correct response from each box to complete the sentences.

The amount of salt in the water at the source of the river is _____

more than
less than

the amount of salt in the water at the delta of the river. The source water is considered _____ because it has _____ salt.

fresh water
salt water

more than 3.5%
less than 3.5%

6. Rivers can carry trash just like they carry rocks in Figure 2. A planning committee wants to identify places where rivers might carry trash. Based on Figure 1, identify the places where rivers could carry trash.

Place a check mark (✔) in each row to identify the correct places. Select **one** box per row.

Place	Yes	No
Source of the rivers		
Delta		

7. A student wonders what force causes the water in the rivers to flow. Based on Figure 1, explain the force that helps the water travel from the source of the rivers toward the ocean. Your response should include:

- identification of the force that causes water to flow from the source of the rivers toward the ocean
- an explanation, based on Figure 1, of why this force affects the direction that the rivers take from their source to the ocean

Directions: Use the information to answer questions 8 through 13.

Part 1

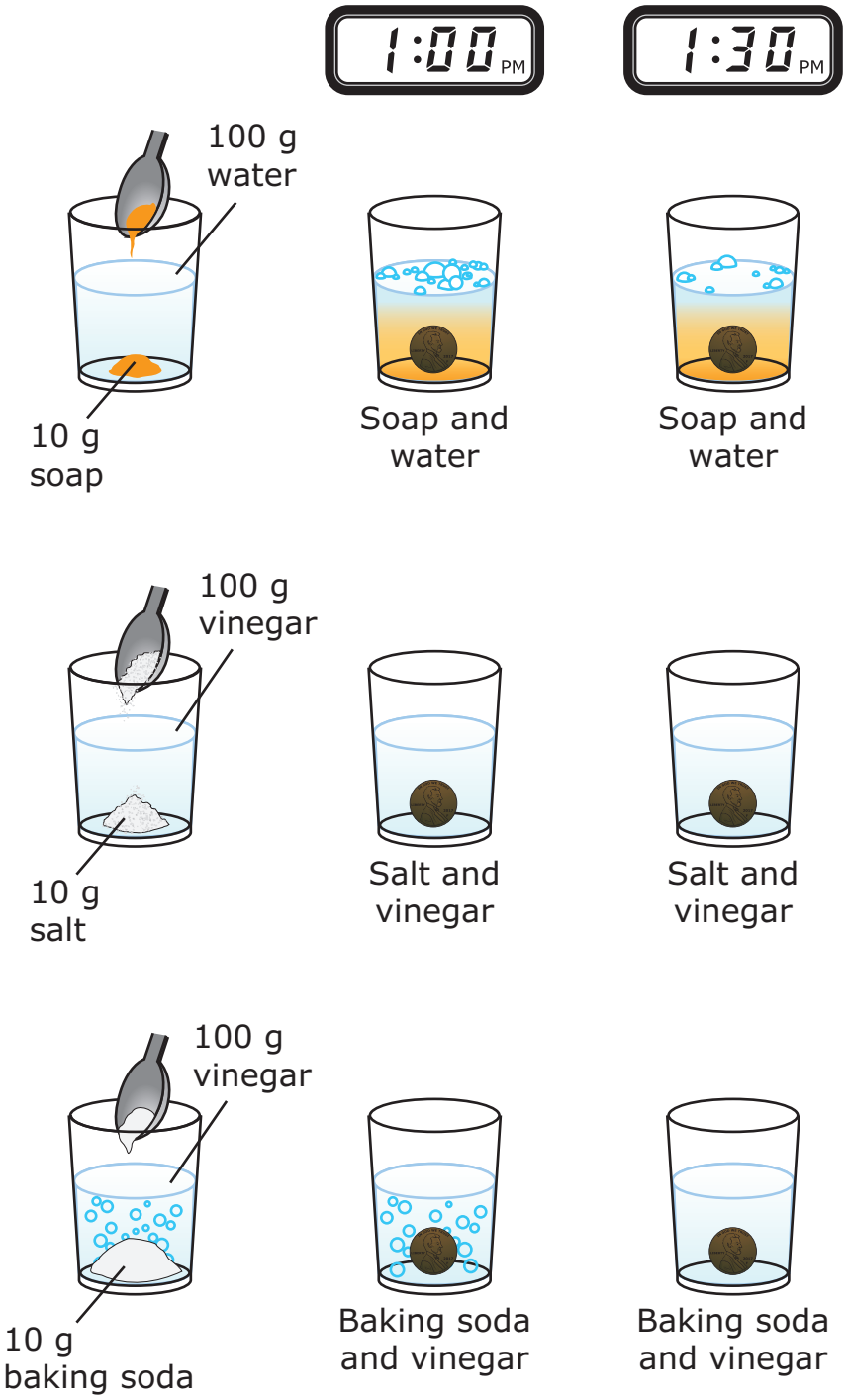
Students observe a crew cleaning a metal fountain. They are curious about how the metal of the fountain is cleaned.

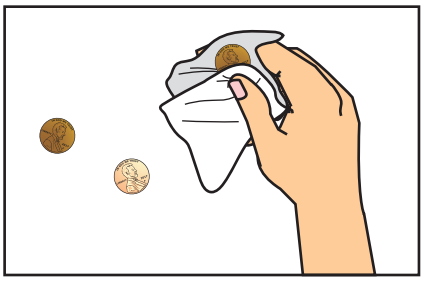
Crew Cleaning Metal Fountain

Part 2

The students gather products used in homemade cleaning solutions and test these solutions on dirty pennies. The mass of each substance is measured in grams (g). The investigation shows the effect these solutions have on the pennies after soaking them in each solution for 30 minutes and wiping down the pennies with a rag.

Investigation 1: Cleaning Pennies Test





Mixture	Before	After
Soap and water		
Salt and vinegar		
Baking soda and vinegar		

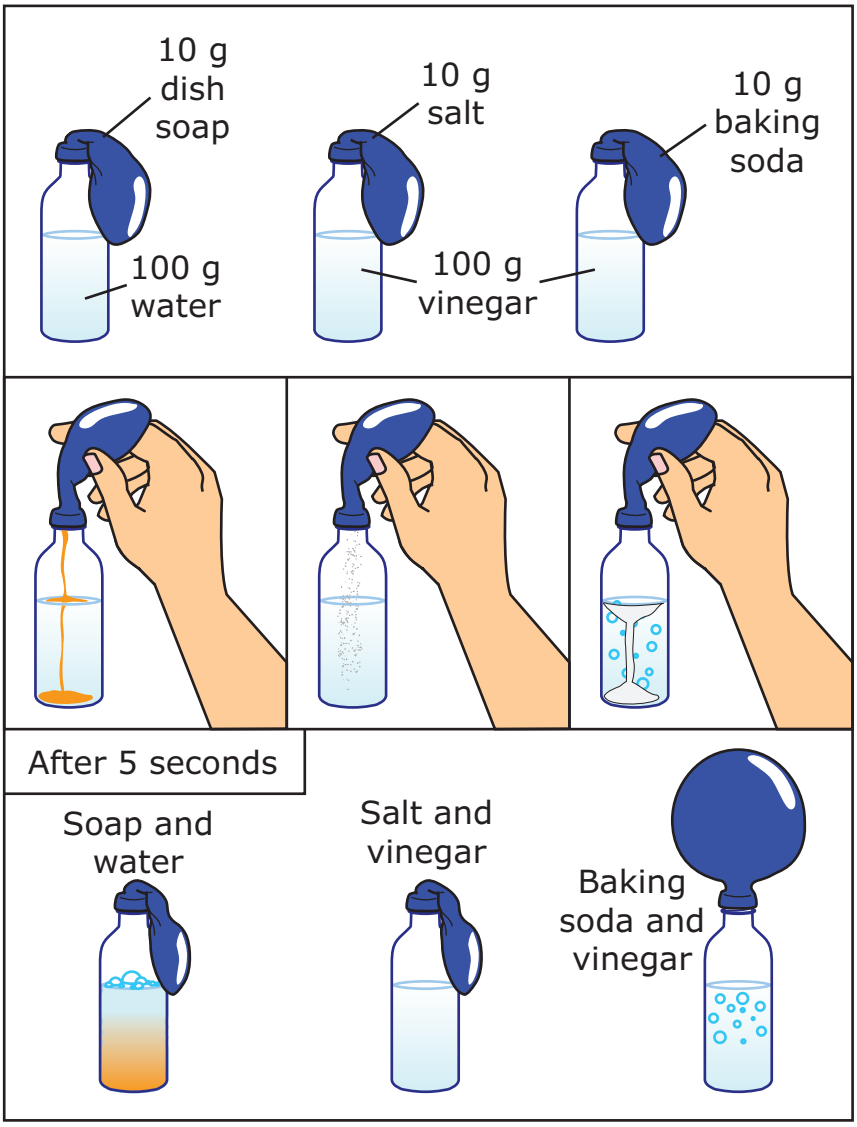
Observations of Penny Test

Mixture	Final Mass of Mixture	Observations	Penny Test
10 g soap + 100 g water	110 g	a few bubbles	penny a little cleaner
10 g salt + 100 g vinegar	110 g	no bubbles	penny completely clean
10 g baking soda + 100 g vinegar	105 g	many bubbles as soon as the substances touch	penny a little cleaner

Part 3

The students are surprised to observe that in one of the cleaning solutions, the final mass of the mixture is lower than the mass of the original mixture. They perform another investigation to study the reason for this change in mass. The figure and data table show the investigation.

Investigation 2: Balloon Test



Observations of the Balloon Test

Mixture	Final Mass of Mixture	Observations	Balloon Test
10 g soap + 100 g water	110 g	a few bubbles when stirred	balloon does not inflate
10 g salt + 100 g vinegar	110 g	no bubbles	balloon does not inflate
10 g baking soda + 100 g vinegar	110 g	many bubbles as soon as the substances touch	balloon inflates

8. A student claims that the force of gravity can be observed during the investigation. Based on the results in Part 2, which statement **best** provides evidence to support the student's claim?

Ⓐ The soap takes a different shape in the glass than it does in the spoon.

Ⓑ The baking soda and vinegar mixture produces bubbles.

Ⓒ The baking soda and vinegar mixture loses mass.

Ⓓ The soap sinks to the bottom of the glass.

9. A student claims that a new substance forms during the investigations. Based on the investigation, which observation **best** provides evidence that a new substance forms during the investigations?

Ⓐ The final mass of each mixture is the same as the total mass of the original substances.

Ⓑ The colored soap turns colorless because it was stirred in the water.

Ⓒ The balloon inflates because baking soda reacts with vinegar.

Ⓓ The penny becomes cleaner in each mixture.

10. A student wonders why the final mass of the baking soda and vinegar mixture changed in the table in Part 2.

Circle one correct response from each box to complete the sentences.

The mass in Part 2 seems to _____ g. But the student can

decrease by 5
increase by 5

use the results in Part 3 as evidence that mass _____ when

stays the same
decreases
increases

baking soda is added to vinegar.

11. The teacher provided the students with 100 g of vinegar and asked the students to add salt to the vinegar. Based on the results in Part 2, explain how the students could measure the amount of salt that was added if the final mass of the mixture is 120 g. Your response should include a description of:

- the likely amount of salt that was added to the vinegar
- the evidence from the investigation for the likely amount of salt added to the vinegar

12. A student claims that a new substance forms only with the mixture of baking soda and vinegar. Based on the results of Part 3, explain why the student's claim is correct. Your response should include:

- a description of the evidence from Part 3 that supports the student's claim
- an explanation of how this evidence supports the student's claim

13. A student has a sample of 10 g of cooking oil that looks similar to the soap in Part 2. Properties of cooking oil and soap are shown in the table.

Properties of Cooking Oil and Soap

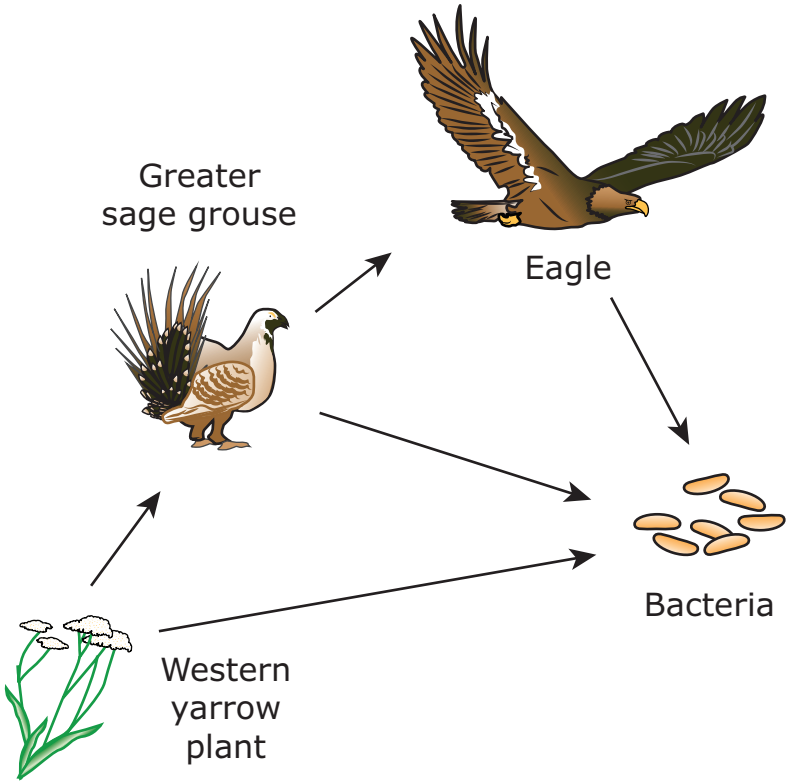
Material	Observation When Stirred in Water	Color in Water
cooking oil	forms drops that float	light tan
soap	disappears	light tan

Explain how a property of cooking oil would allow filter paper to separate the oil from water. Your response should include:

- identification of the property that causes the difference observed when the materials are stirred in water
- an explanation of why filter paper can only use this property to separate oil and water, not soap and water

14. Students learn that farmers often put fertilizer in the soil. Fertilizer helps the farmers grow the fruits and vegetables people use for food. The students wonder how wild plants grow without people adding fertilizer to the soil.

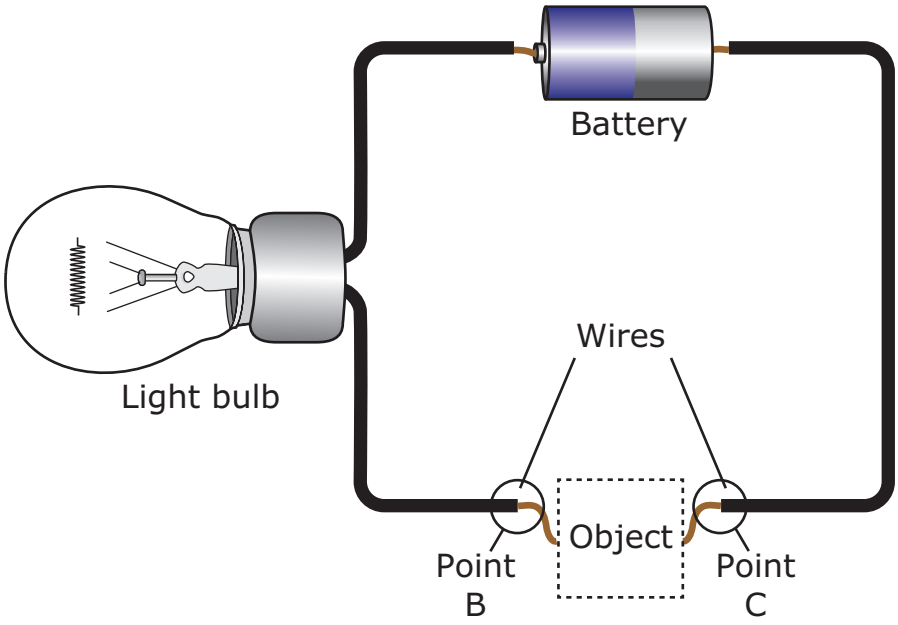
Circle **one** organism in the food web that would help the wild plants the same way the fertilizer helps the farmer's crops.



This is the end of Item Set 2.

ITEM SET 3

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 _____.

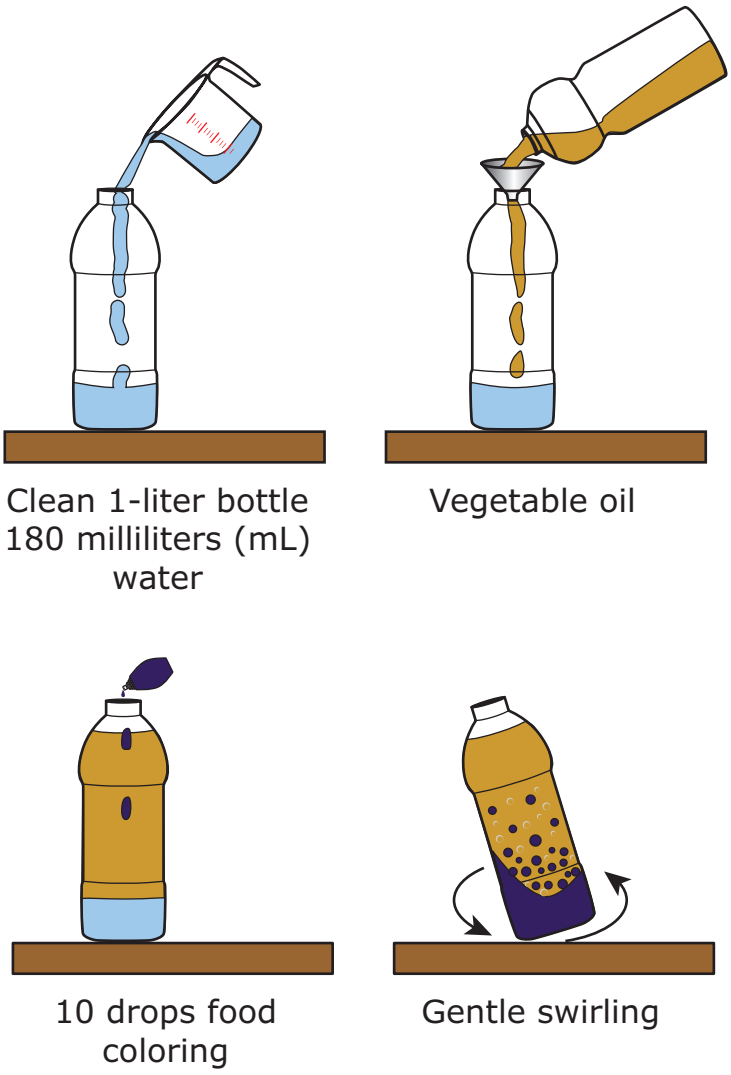
makes the light shine brighter
is more attracted to the wires

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

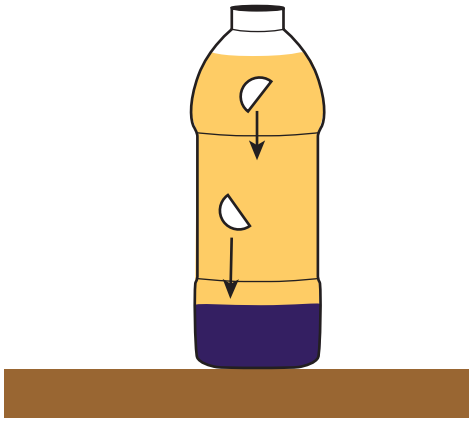


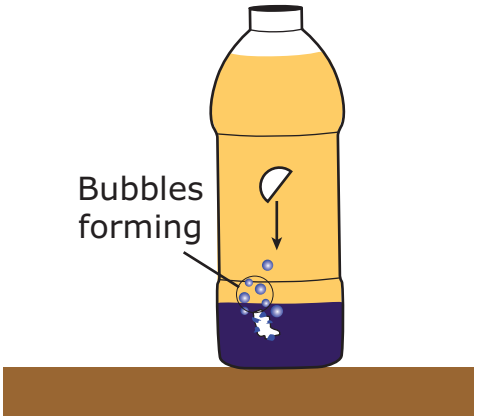
Part 2

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.

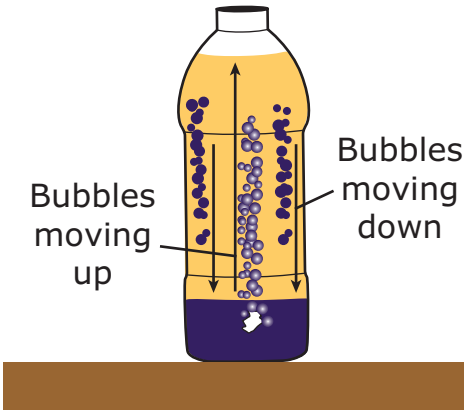
Figure 2: Science in a Bottle Investigation





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?

Ⓐ

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

Ⓑ

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

Ⓒ

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

Ⓓ

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?

Ⓐ Small particles of gaseous matter exit the bottle.

Ⓑ Small bubbles in the bottle turn back into water.

Ⓒ The oil and water mix to form a single layer.

Ⓓ 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.

Ⓐ The mass of the bottle after the investigation was greater than the mass of the bottle and tablet before the investigation.

Ⓑ The mass of the bottle after the investigation was the same as the mass of the bottle and tablet before the investigation.

Ⓒ The mass of the bottle after the investigation was less than the mass of the bottle and tablet before the investigation.

Ⓓ This is evidence that no new substance was formed as the matter in the tablet was destroyed.

Ⓔ 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

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

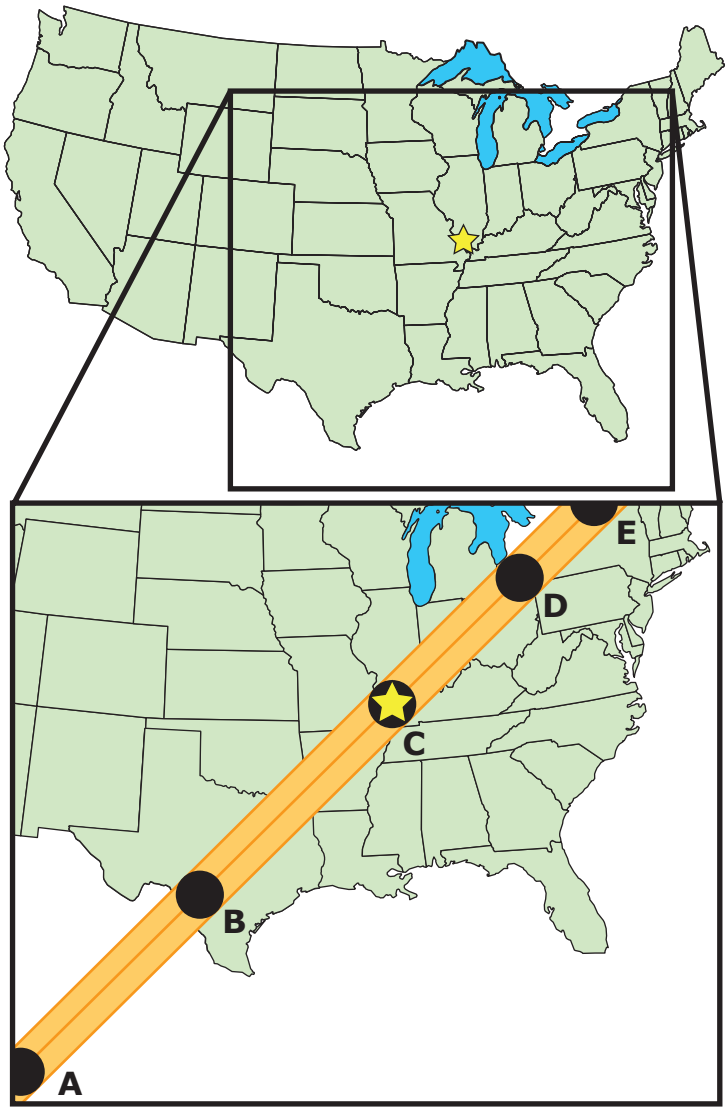
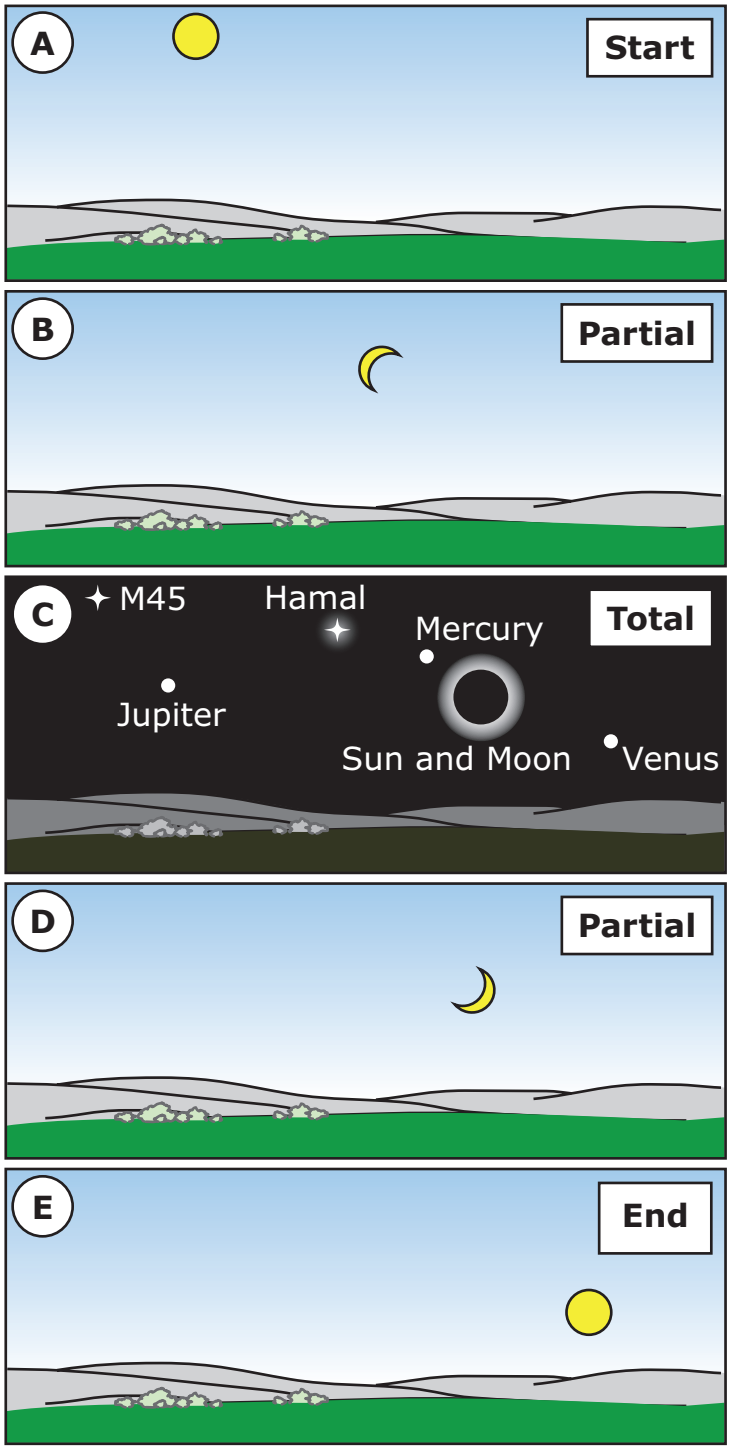


Figure 2: Appearance of the Sky When the Moon's Shadow Is at Each Location



Data Table

Event	Time	Stars Visible in Sky?
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

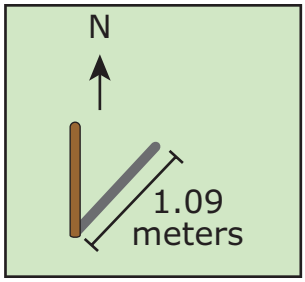
that if Venus appears brighter than Mercury, then Venus is probably _____ Earth than Mercury is.

farther away from
closer to

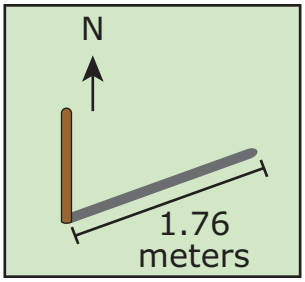
7. Outside the path of the total solar eclipse, the pattern of shadows is the same as on any other day. Show how shadows change on the day of the eclipse for someone outside the path of the eclipse.

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.

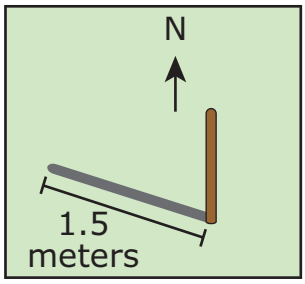
A.



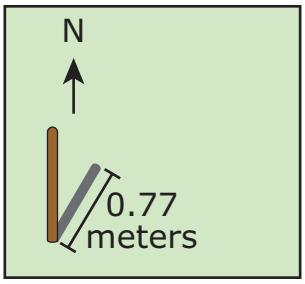
B.



C.



D.



Shadow when partial eclipse begins	Shadow during maximum eclipse	Shadow when partial eclipse ends
_____	_____	_____

8. In the Northern Hemisphere, M45 is visible during the total solar eclipse and also in the night sky. 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?

Ⓐ because M45 changes the amount of light it gives off during different seasons

Ⓑ because M45 moves closer to or farther from planets during different seasons

Ⓒ because Earth revolves around the Sun

Ⓓ 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

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

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

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

Part 1

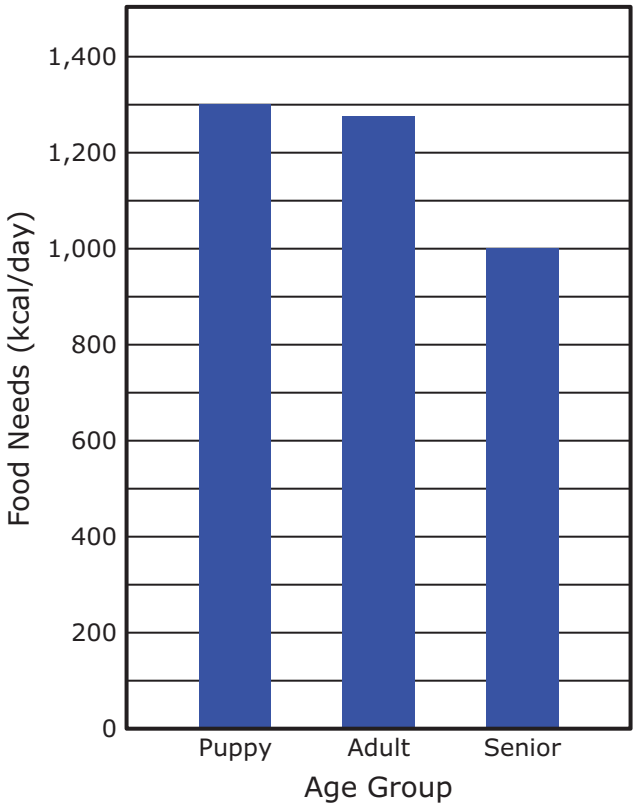
Two dogs eat different amounts of food. Dog 1 is larger than Dog 2, and Dog 1 eats less food than Dog 2. A student wonders why this happens. The student finds a scientific study about the amount of nutrients dogs need from food, measured in a unit called kilocalories (kcal), per day. The student finds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

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

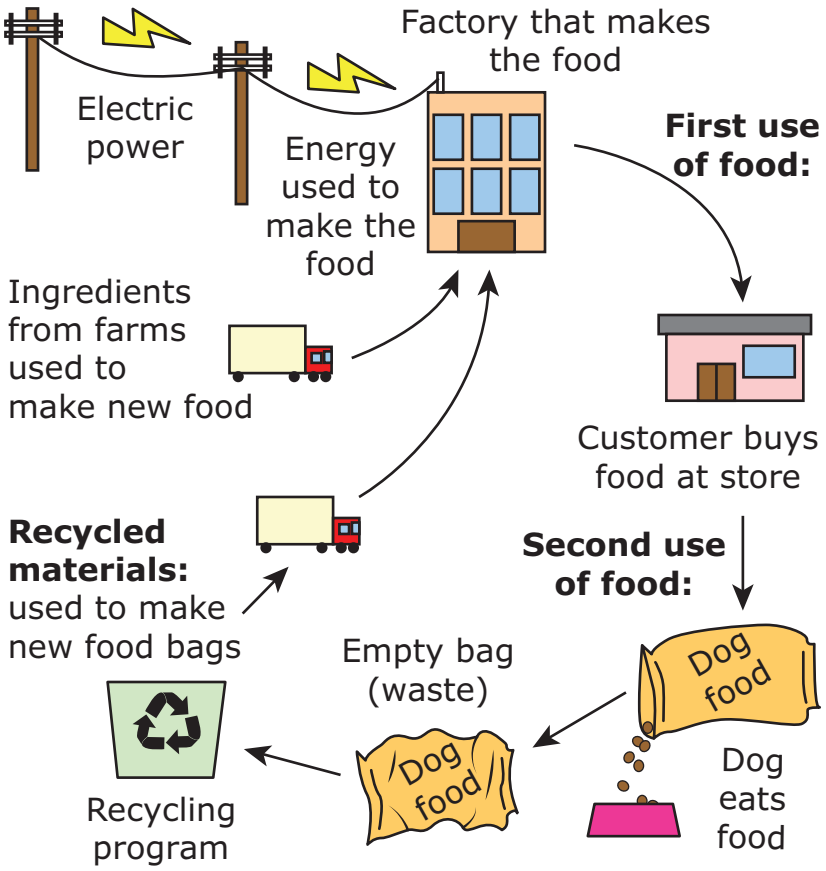
Figure 1: Food Needs Based on Age of Dog



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?

Ⓐ Medium-sized dogs use more energy from the Sun than small-sized dogs use.

Ⓑ Medium-sized dogs use more energy from water than giant-sized dogs use.

Ⓒ Large-sized dogs use more energy from the Sun than giant-sized dogs use.

Ⓓ 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?

Ⓐ The truck moving ingredients from the farm is like decomposed matter moving from soil to plants.

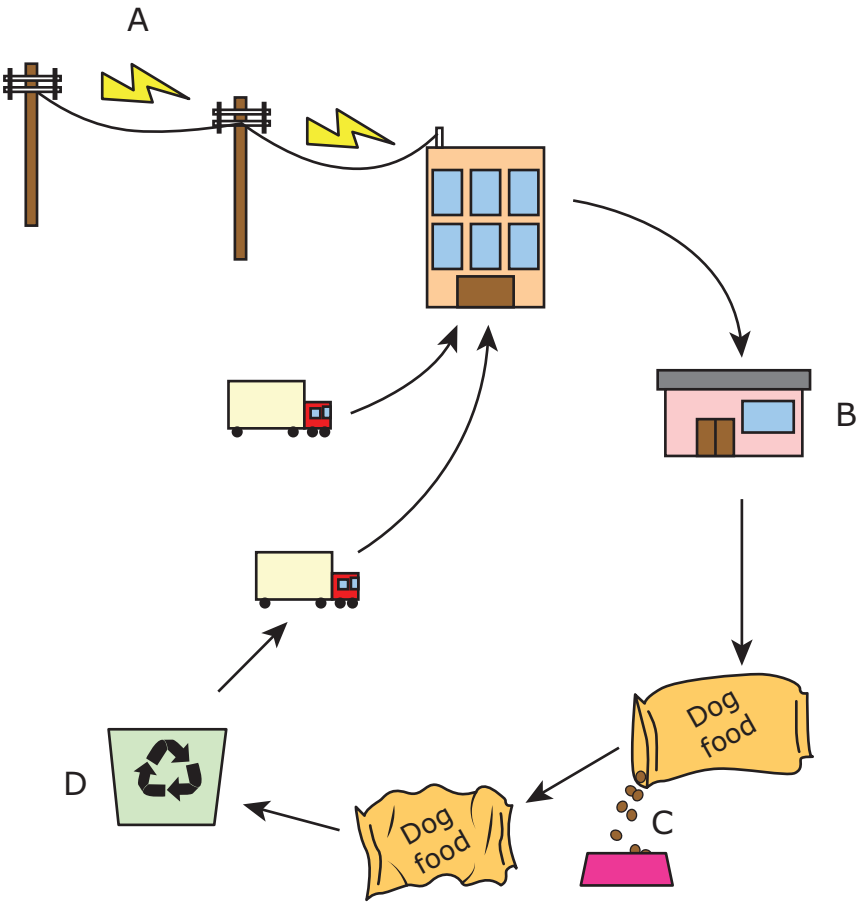
Ⓑ The truck moving recycled materials is like decomposed matter moving from soil to plants.

Ⓒ The truck moving ingredients from the farm is like energy traveling from the Sun to plants.

Ⓓ 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.

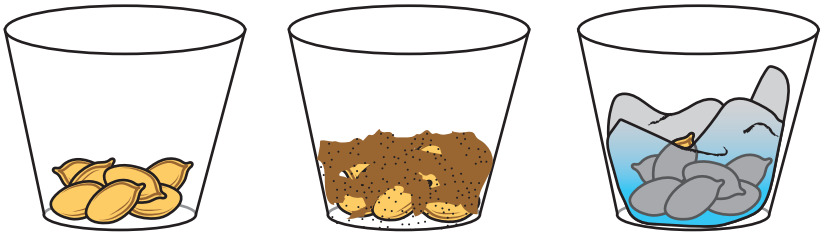
Using the information in Part 2, circle the letter for the part of the model that represents the Sun's energy.



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

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

This is the end of Item Set 3.

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