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**Place the  
Student ID Label Here**

**D Gender**

☐ Female ☐ Male

☐ Non-Binary

E		Date of Birth			
Day		Month	Year		
(0)	(0)	( ) Jan		(0)	(0) (0)
(1)	(1)	( ) Feb	(1)	(1)	(1)
(2)	(2)	( ) Mar	(2)	(2)	(2)
(3)	(3)	( ) Apr		(3)	(3)
	(4)	( ) May		(4)	(4)
	(5)	( ) Jun		(5)	(5)
	(6)	( ) Jul		(6)	(6)
	(7)	( ) Aug		(7)	(7)
	(8)	( ) Sep		(8)	(8)
	(9)	( ) Oct		(9)	(9)
		( ) Nov			
		( ) Dec			



# Section 1

**Directions:**

Today, you will take Section 1 of the MISA Practice Test.

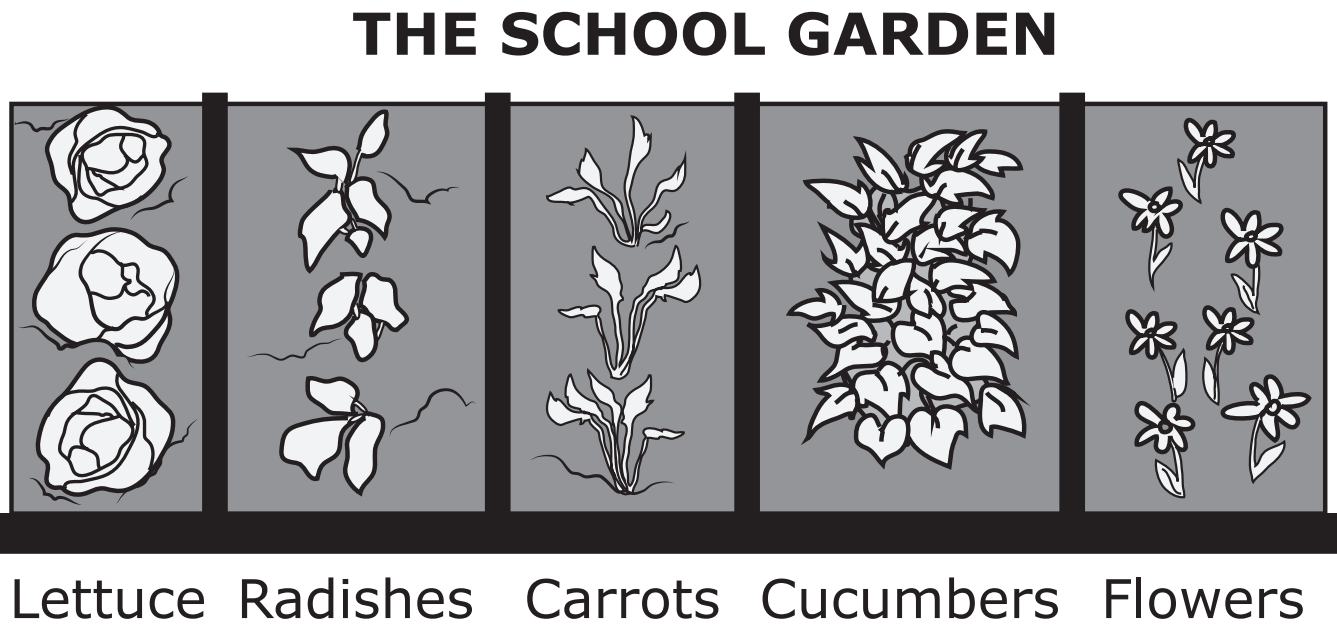
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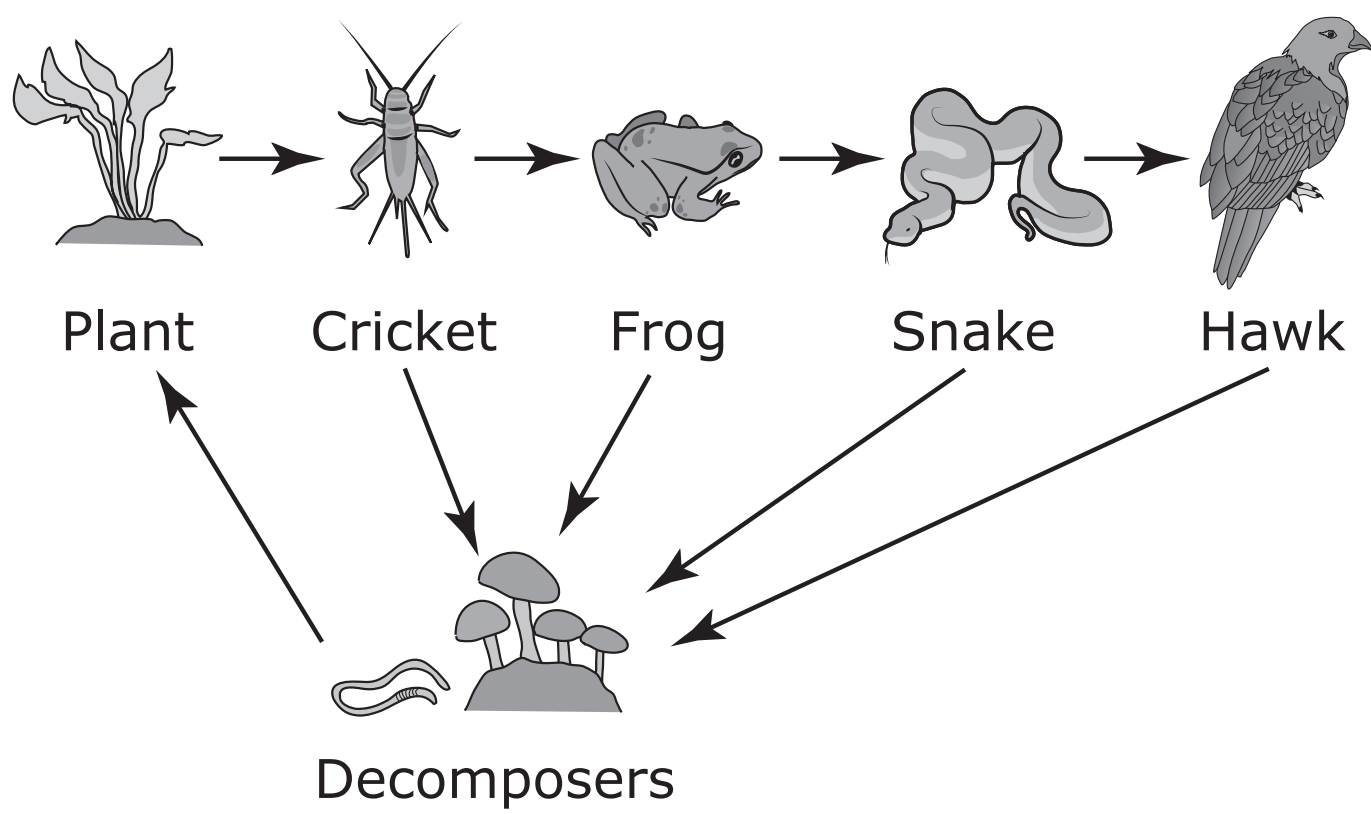
After observing a flower garden outside the school, a science class discussed what plants need to grow and set up an investigation with the help of the teacher. The students added compost, organic matter used to help plants grow, to the soil. They then planted the seeds of five different plants. The students made sure the soil was watered each day. After a few weeks, the plants started to sprout, and the students observed the growth of each plant. A diagram of the school garden is shown.



Once a week, the students recorded their observations about the garden in their journals. When the plants were fully grown, the students took the plants out of the soil, rinsed them off with water, and had a garden day. During garden day, other students from the school were invited to view the fully grown plants.

After the plants started to grow, the students noticed organisms that were not there before the garden was planted. The students learned that over time the garden had become a small ecosystem. To demonstrate the flow of energy in the garden ecosystem, the students drew a diagram and included decomposers found in the compost, producers, and consumers as shown.

ENERGY FLOW IN A GARDEN ECOSYSTEM

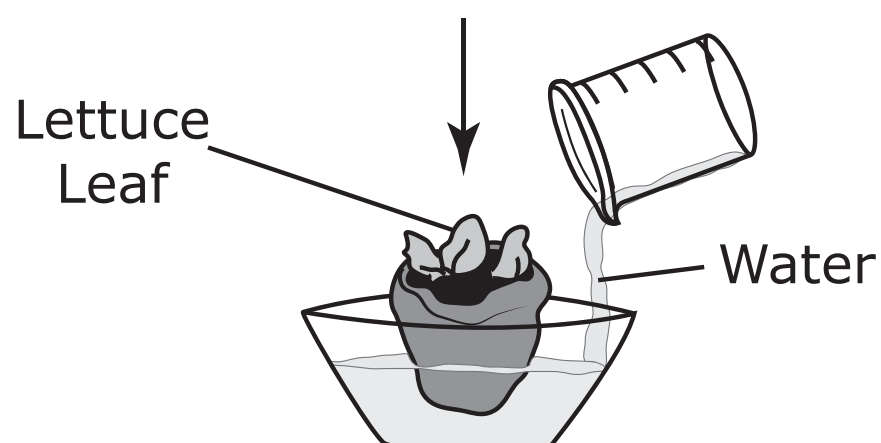


After the students rinsed off the fully grown lettuce, the teacher explained that some plants, such as lettuce, can be regrown from cuttings. The teacher then cut the lettuce, keeping the stem, and placed it in a bowl of water on a windowsill. The students added water to the bowl once a day for ten days. During that time, the lettuce started to sprout new leaves.

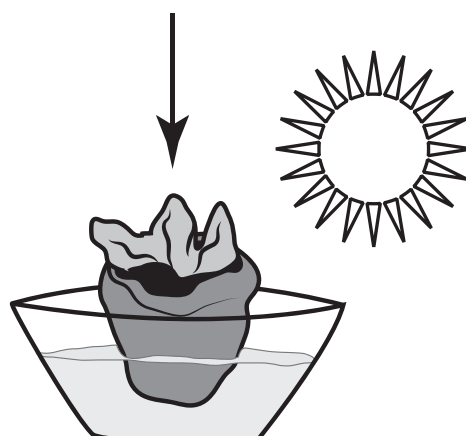
### HOW TO REGROW LETTUCE



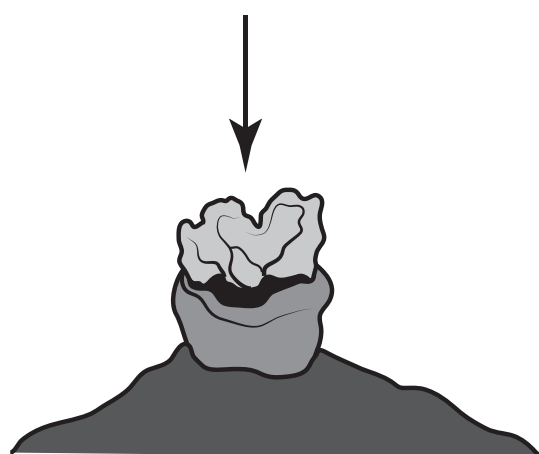
Place the stem of the lettuce in a bowl of water with the top exposed to air.



Add water every day.



Keep the bowl in a sunny area.



Once the lettuce sprouts, plant it in the school garden.

After the lettuce sprouted, the teacher took the lettuce to the school garden and planted it so that the lettuce plant could continue to grow until it was ready to be picked. The students then recorded in their journals the materials needed to recycle lettuce plants and how the lettuce plants can be recycled.

- 1 The compost in the school garden contained pieces of nonliving plants.**

**The plant matter was most likely placed in the compost to be**

- Ⓐ eaten by the crickets.
- Ⓑ used as shelter by the snakes.
- Ⓒ used as nutrients for the hawk.
- Ⓓ broken down by the decomposers.

- 2 A student observed a caterpillar eating a leaf in the garden.**

**If the student placed the caterpillar into the garden ecosystem diagram, the caterpillar would replace**

- Ⓐ the plant as a producer.
- Ⓑ the cricket as a producer.
- Ⓒ the plant as a consumer.
- Ⓓ the cricket as a consumer.

- 3 The students included decomposers in the garden ecosystem diagram to show that decomposers have important roles in the garden ecosystem.**

**Identify the roles of decomposers.**

**Select two.**

- Ⓐ eat plant roots
- Ⓑ compete with plants for soil
- Ⓒ remove nutrients from the soil
- Ⓓ recycle material back into the soil
- Ⓔ break down plant and animal remains

**4 The lettuce plant grew new leaves after the teacher placed it in the bowl of water in the classroom.**

**The students claimed the plant grew new leaves because the plant**

- Ⓐ can survive and grow anywhere.
- Ⓑ was away from insects and other animals in the garden.
- Ⓒ needed a different temperature than the outside garden.
- Ⓓ received the materials it needed from water, air, and sunlight.

**5 One of the students claimed that the lettuce did not have to be planted in the garden to survive.**

**Which statement provides evidence that supports this claim?**

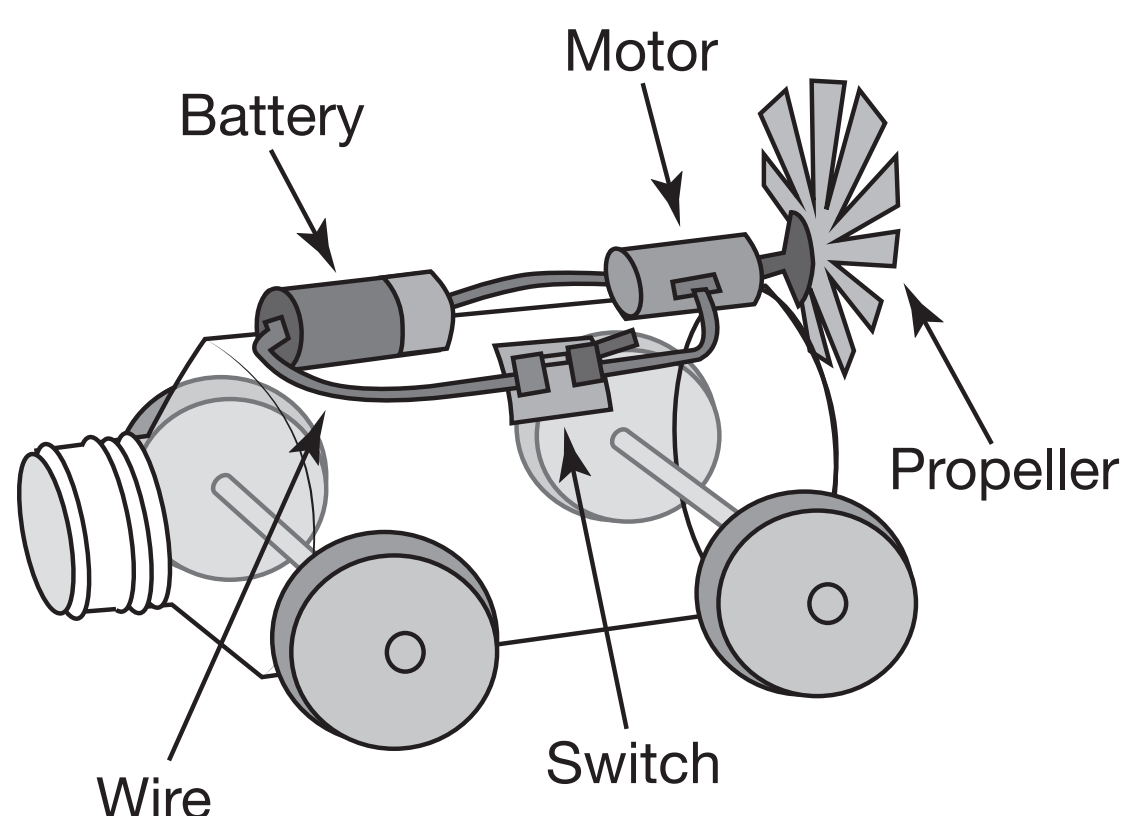
- Ⓐ The lettuce grew in the garden.
- Ⓑ The lettuce in the classroom sprouted new leaves.
- Ⓒ The students watered the lettuce in the classroom.
- Ⓓ The students saw insects and other animals in the garden.

[illegible]

**Read all of the information. Use the information to answer the questions.**

**While investigating the different forms of energy during science class, a group of students constructed a circuit using a battery, switch, and wires connected to a light bulb in order to cause the light bulb to light up. This led the students to pose questions as to whether a similar design could be used to produce different forms of energy to move objects, make sound, or give off heat.**

**After researching the different forms of energy, the students decided to build a motorized toy car. For the investigation, the students constructed the toy car using a recycled water bottle, wheels from another toy, a battery, switch, wires, and a motor attached to a propeller. During the investigation, the students constructed the car by attaching the wheels to the water bottle and securing the battery and wires, motorized propeller, and switch on the top, as shown in the following diagram.**



**The students predicted that if they completed the circuit correctly, the propeller would spin and the toy car would be propelled forward.**

- 7 In their journals, the students described the transfer of energy needed to cause the propeller to spin.**

**The best description of the transfer of energy needed to make the toy car move is**

- Ⓐ heat energy is converted to sound energy.
- Ⓑ electrical energy is converted to light energy.
- Ⓒ heat energy is converted to the energy of motion.
- Ⓓ electrical energy is converted to the energy of motion.

- 8 Select the three statements that best identify the role of the battery, motor, and switch in the circuit.**

- Ⓐ The battery provides the energy of motion to the propeller.
- Ⓑ The battery provides the energy to the circuit.
- Ⓒ The motor provides the energy to the circuit.
- Ⓓ The motor provides the energy of motion to the propeller.
- Ⓔ The switch provides the energy to the circuit.
- Ⓕ The switch opens and closes the circuit.

**9 Which observation about the final designed toy car provides evidence that the switch controls the flow of the electrical current?**

- Ⓐ The car does not move when the switch is open.
- Ⓑ The car does not move when the switch is closed.
- Ⓒ The shape of the switch handle does not affect how far the car moves.
- Ⓓ The length of the switch handle does not affect how far the car moves.

**10 The data collected on the results of this investigation and the pictures of the toy car will be posted on the school Web site.**

**The results will most likely show that the toy car moved as a result of**

- Ⓐ the motor charging the battery.
- Ⓑ the battery providing energy to the motor.
- Ⓒ the motor providing chemical energy to the propeller.
- Ⓓ the battery changing electrical energy into chemical energy.

**11 Which statement provides the best evidence that energy is being transferred in the toy car investigation?**

- Ⓐ The propeller did not move.
- Ⓑ The students saw light.
- Ⓒ The switch was open.
- Ⓓ The car moved.

**12 Use evidence from the investigation to explain why the provided materials were used to construct the toy car.**

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**You have come to the end of Section 1 of the test. Review your answers from Section 1 only.**



**GO ON TO NEXT PAGE**

# Section 2

**Directions:**

Today, you will take Section 2 of the MISA Practice Test.

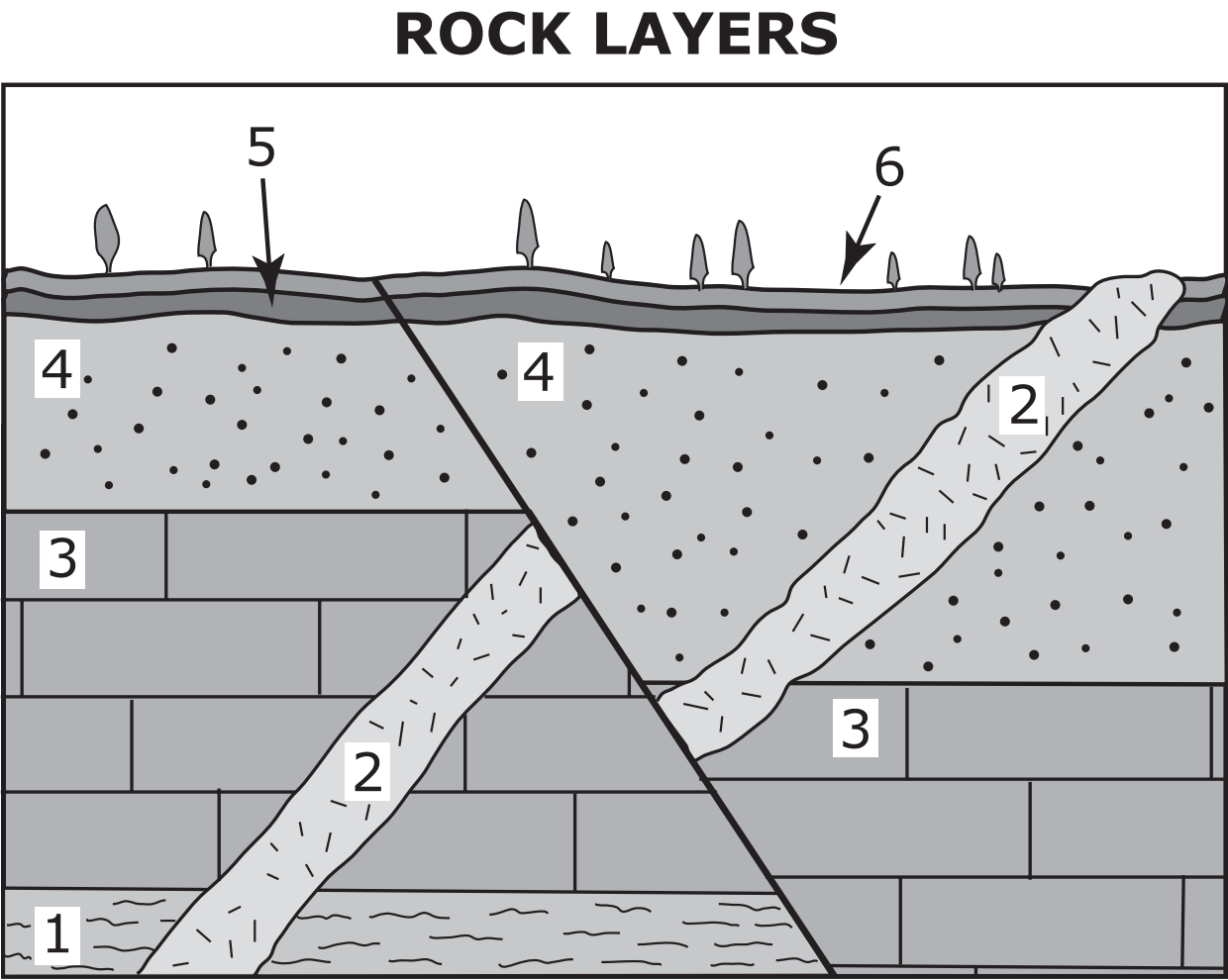
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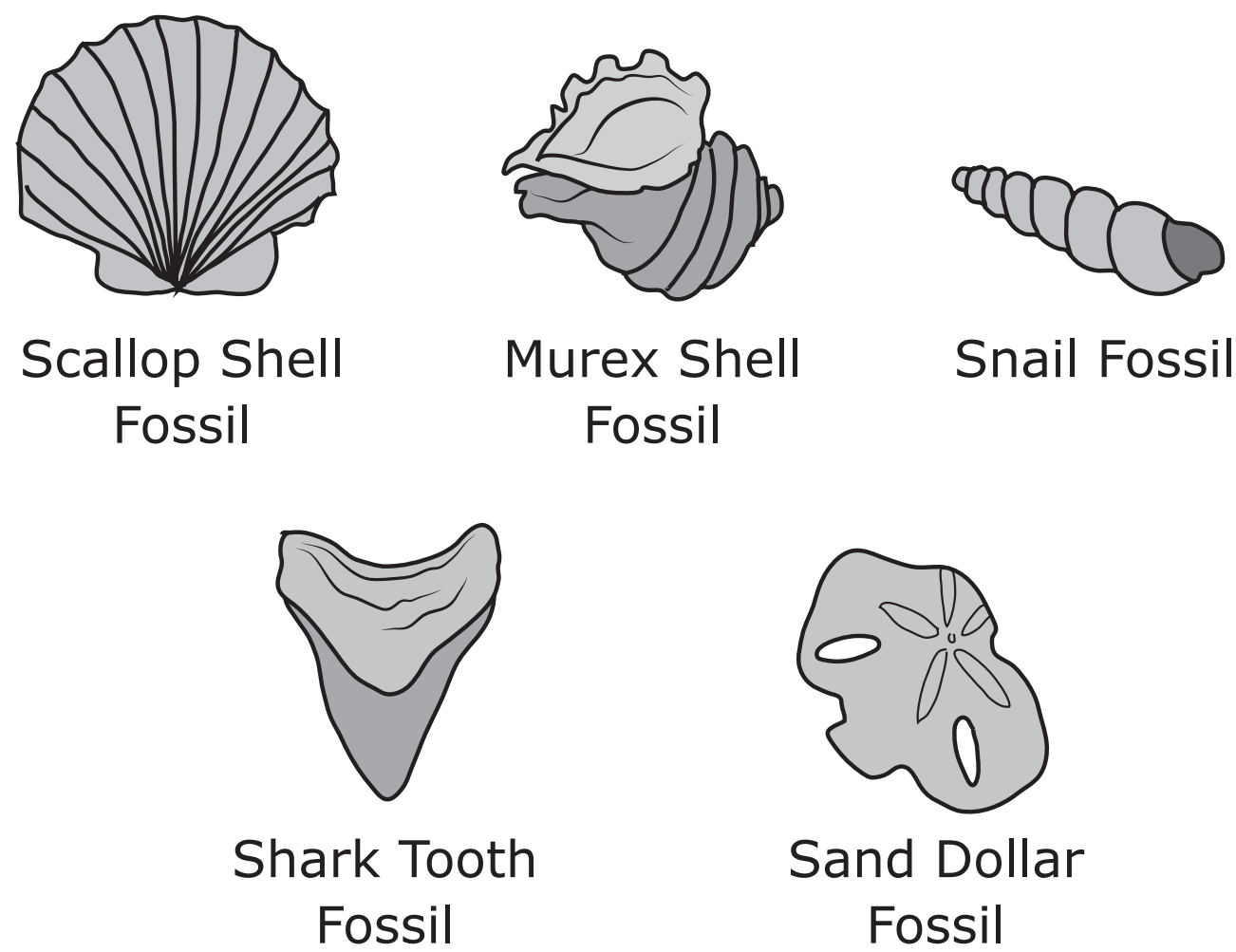
A science club was planning a field trip to Calvert Cliffs State Park in Maryland. The purpose of the field trip was to observe rock layers and to record information about the different layers of rock. Before the trip, the students researched rock layers and drew diagrams of different rock layers in their science journals. One diagram showed rock layers that appeared to have moved over time, shown as follows.



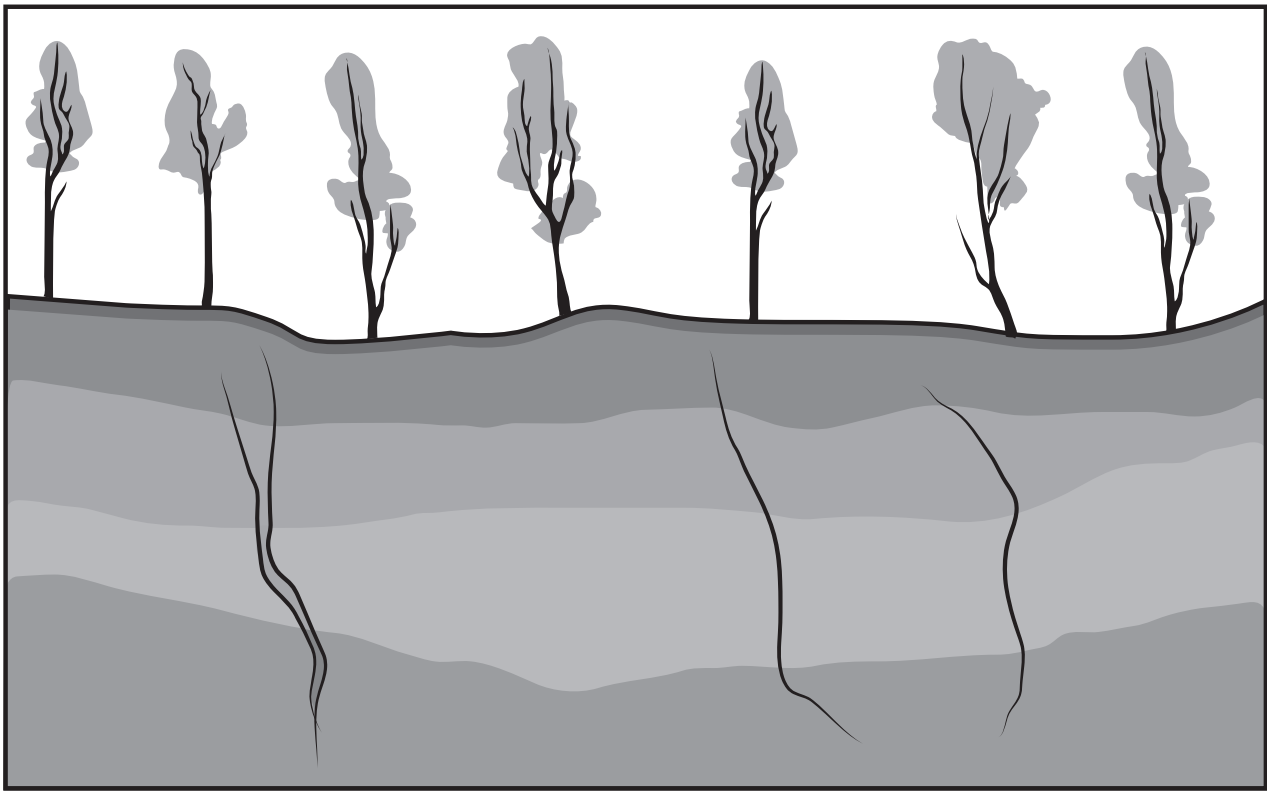
Section 2

After the field trip to Calvert Cliffs, some students stated that they observed rock layers high up on the cliff face similar to the diagrams they made in their science journals. The rock layers were visible due to their different coloration. The students also observed fossils in some of the rock layers. The diagrams of the fossils they observed and the rock layers in the cliffs are shown.

**FOSSILS OBSERVED AT CALVERT CLIFFS**

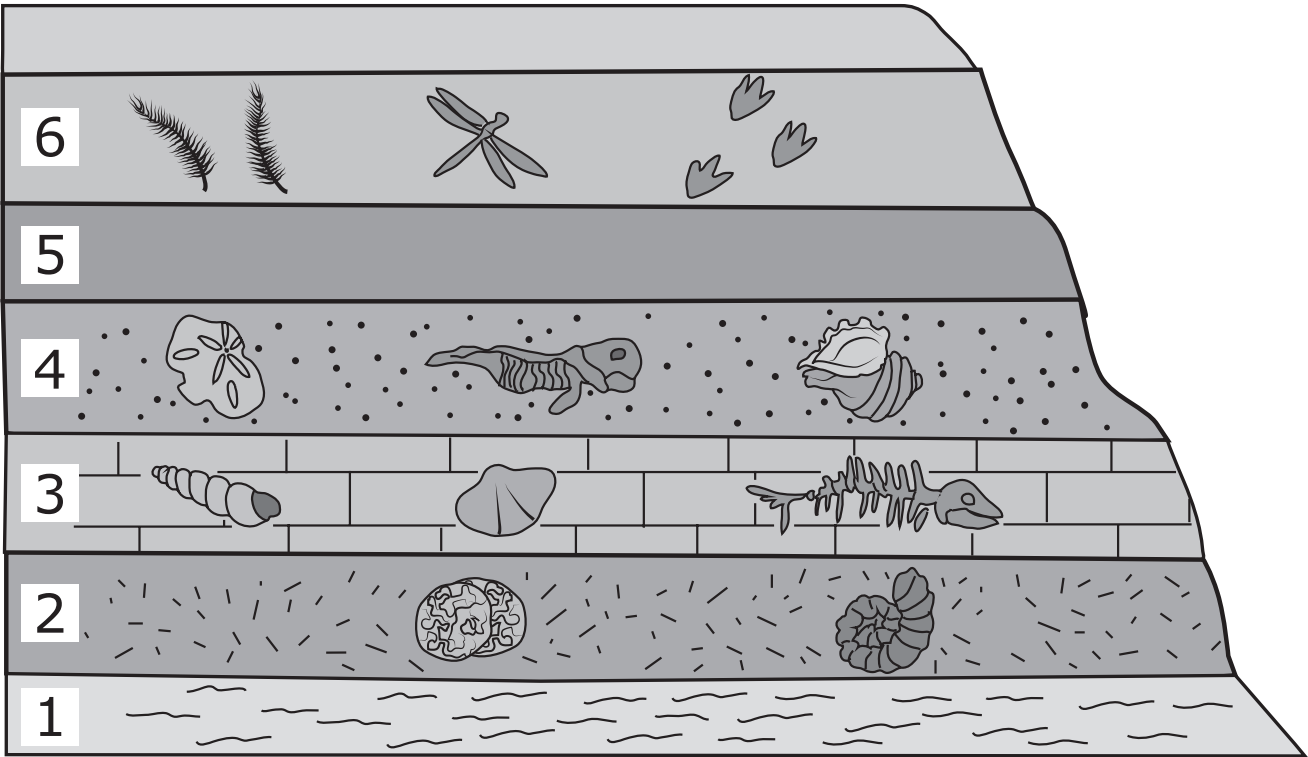


**ROCK LAYERS OF CALVERT CLIFFS**



The students continued their research to determine the types of fossils that may be found in the different rock layers. The following diagram illustrates some of the fossils that formed in the different rock layers.

ROCK LAYERS CONTAINING FOSSILS



not drawn to scale

Section 2

- 1 The students' diagram of the rock layers that appeared to have moved is evidence that the area was affected by an Earth force.**

**The event that most likely caused the movement shown in the diagram was**

- Ⓐ a flood.
- Ⓑ a hurricane.
- Ⓒ an earthquake.
- Ⓓ a volcano eruption.

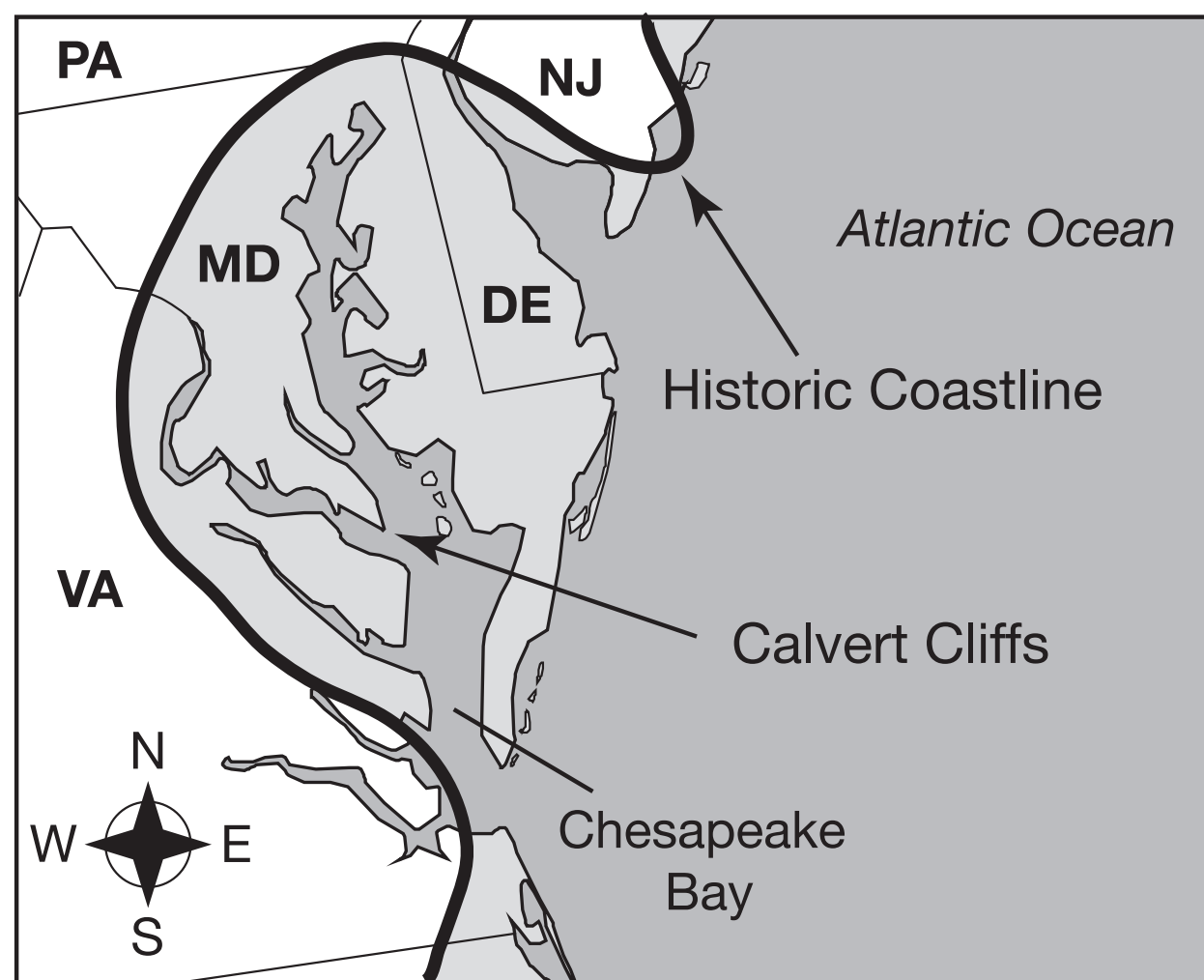
- 2 The fossils and rock layers provide evidence that although it is now dry land, millions of years ago the area of Calvert Cliffs was**

- Ⓐ underwater.
- Ⓑ hot and humid.
- Ⓒ the same as today.
- Ⓓ a desert environment.

- 3 The students concluded that Calvert Cliffs at one time was**

- Ⓐ a desert environment because of the fossil evidence from land mammals.
- Ⓑ a mountain environment because of the fossil evidence from land mammals.
- Ⓒ a forest environment because of the fossil evidence from marine organisms.
- Ⓓ an ocean environment because of the fossil evidence from marine organisms.

- 4 One student drew the following map that identified the ocean shoreline in the area of Calvert Cliffs millions of years ago.



**The data to support the student's map of the historic coastline is**

- Ⓐ the types of rocks found at Calvert Cliffs.
- Ⓑ the types of fossils found at Calvert Cliffs.
- Ⓒ the number of rock layers found at Calvert Cliffs.
- Ⓓ the amount of water at the bottom of Calvert Cliffs.

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**5 Which statement is supported by the evidence in the Rock Layers Containing Fossils diagram?**

- Ⓐ The organisms in layer 3 lived before organisms in layer 2 and after organisms in layer 6.
- Ⓑ The organisms in layer 3 lived after organisms in layer 2 and before organisms in layer 6.
- Ⓒ The organisms in layer 3 lived after organisms in layer 4 and at the same time as organisms in layer 6.
- Ⓓ The organisms in layer 3 lived before organisms in layer 4 and at the same time as organisms in layer 6.

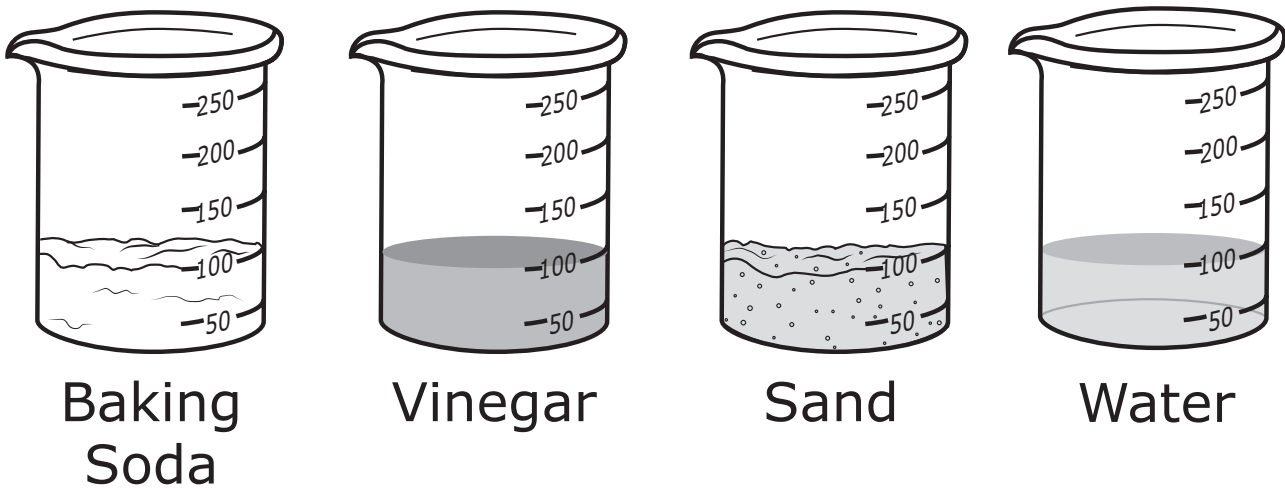
6 Use evidence from the diagrams to describe how the Calvert Cliffs most likely appeared millions of years ago.

Handwriting practice lines for the answer to question 6.

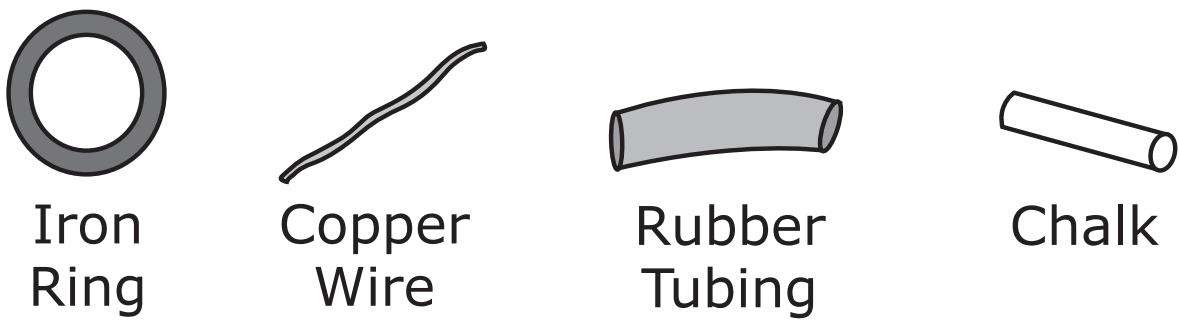
Read all of the information. Use the information to answer the questions.

A science class investigated the properties of matter and observed that some forms of matter, gases, such as air, are not easily observed. Other forms of matter, such as liquids and solids, are easily observed and can be sorted using physical properties. In order to investigate the physical properties of matter, the students gathered some liquids and powdery solids in beakers as well as other solid objects from the teacher’s lab supplies. The students went over safety instructions with the teacher and put on protective goggles and lab coats. The collection of solid and liquid matter is shown.

Liquids and Powdery Solids



Other Solid Objects

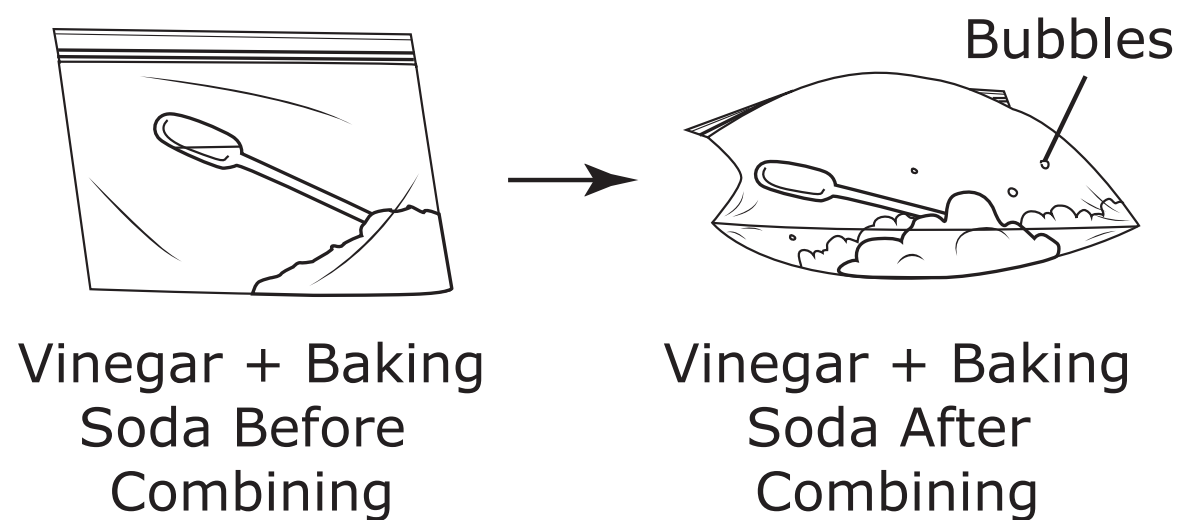


After reviewing the safety instructions with the teacher, the students put on protective goggles and lab coats and proceeded with the investigations. In the first investigation, the students combined vinegar and baking soda and recorded the results in their lab journals. Then they changed the investigation by combining vinegar and sand. The students' procedures are shown.

**Combining vinegar and baking soda.**

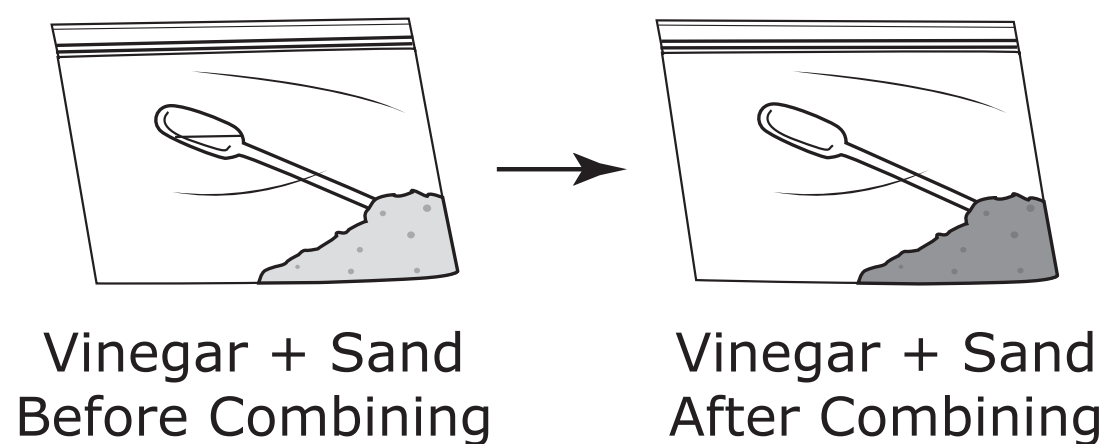
1. Place a plastic pipette filled with vinegar inside a plastic bag containing baking soda.
2. Seal the plastic bag.
3. Measure the mass of the bag using a balance.
4. Place the bag on a lab table.
5. Squeeze the pipette to combine the vinegar with the baking soda.
6. Measure the mass of the sealed bag and contents using a balance.
7. Record observations in lab journal.

A diagram of the result of combining vinegar with baking soda is shown.



The students used the same procedure and repeated the investigation, replacing the baking soda with sand.

A diagram of the results of combining vinegar with sand is shown.



- 7 Before mixing the vinegar and baking soda, the students identified the qualitative properties of the two substances in their lab journals.**

**Select three qualitative properties of the two substances.**

- Ⓐ vinegar is a liquid
- Ⓑ the color of baking soda
- Ⓒ baking soda is a solid
- Ⓓ the volume of vinegar used
- Ⓔ mass of the baking soda used

**8 Part A**

The students placed the same amount of liquid in each beaker in the examining matter investigation. The unit of measurement for the liquid in each beaker was 100

- Ⓐ liters.
- Ⓑ milliliters.
- Ⓒ grams.
- Ⓓ milligrams.

**Part B**

Then the students observed that the same amount of liquid was placed in the beakers; however, some beakers felt heavier, which was evidence that the beakers could be sorted in a different way.

Which physical properties of the liquids in the beakers would the students most likely use to sort the liquids?

Select two.

- Ⓐ color
- Ⓑ mass
- Ⓒ hardness
- Ⓓ volume
- Ⓔ temperature

**9 The students investigated different ways to identify the solid materials based on observable and measurable properties.**

Which properties of solids are observed by scratching the surface and shining a light on a solid material?

- Ⓐ mass and solubility
- Ⓑ mass and hardness
- Ⓒ hardness and reflectivity
- Ⓓ hardness and electrical conductivity

- 10 The students concluded from the results of the investigations that when materials are combined, sometimes a new substance is formed.**

**Identify the evidence from the investigations that supports the conclusion that a new substance was formed.**

**Select two.**

- Ⓐ The bag expanded.
- Ⓑ A liquid combined with a solid.
- Ⓒ The sand got wet when combined with vinegar.
- Ⓓ The mass changed after the substances were combined.
- Ⓔ Bubbles formed in the bag with the vinegar and baking soda.

- 11 After combining the materials, the students collected qualitative and quantitative data about the substances. The students used various lab tools to more closely observe if a change occurred to the substances and then recorded their observations in their lab journals.**

**Which tools would the students use to collect quantitative data?**

**Select three.**

- Ⓐ Balance
- Ⓑ Microscope
- Ⓒ Thermometer
- Ⓓ Magnifying glass
- Ⓔ Graduated cylinder

**12 Use data from the mixing materials investigation to identify evidence that a new substance had formed.**

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# Section 3

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A student observed that some power plants and vehicles release smoke into the air, and some do not. The student began researching the energy sources that might make this difference possible and what effect these sources of energy might have on the environment.

The research stated that depending on where people live, electricity is produced using biomass, fossil fuel, hydroelectricity, nuclear power, solar energy, or wind power. The student found that most vehicles are powered by fossil fuels, but some now run on electricity. The research also stated that some stoves use natural gas, while others use electricity, and that the burning of fossil fuels releases warming gases that contribute to climate change.

The student constructed a table from the research about how energy is produced from the different energy sources, including some facts about each energy source, shown as follows.

Energy Source	How Energy Is Produced	Facts about Using the Resource
<b>Biomass</b>	Household garbage, logging and farming leftovers, and food crops are processed into fuels for transportation and to produce electricity.	<ul style="list-style-type: none"><li>• Less waste makes it to landfills.</li><li>• More land is needed for crops.</li><li>• Burning biomass releases fewer warming gases than burning fossil fuels.</li></ul>
<b>Fossil fuels</b>	Coal, oil, and natural gas are burned to produce electricity and power transportation and other engines.	<ul style="list-style-type: none"><li>• A large amount of energy is contained in a small amount of fuel.</li><li>• The fuel takes millions of years to occur naturally.</li><li>• Warming gases are released when burned.</li></ul>

Energy Source	How Energy Is Produced	Facts about Using the Resource
Hydroelectricity	Water behind a dam pours through an opening to spin turbines to produce electricity.	<ul style="list-style-type: none"><li>• Areas where water can be trapped by a dam are limited.</li><li>• Animals in the water can be harmed near the dam.</li><li>• No warming gases are produced.</li></ul>
Nuclear	Heat from mined nuclear material boils water. Steam spins turbines to produce electricity.	<ul style="list-style-type: none"><li>• Enough electricity is produced to power large cities.</li><li>• Nuclear waste is very dangerous and must be disposed of by the government.</li><li>• No warming gases are produced.</li></ul>
Solar	Solar cells formed into panels change sunlight directly into electricity.	<ul style="list-style-type: none"><li>• The sun needs to be out to make electricity.</li><li>• No warming gases are produced.</li></ul>
Wind	Blowing wind spins large windmills connected to electric generators.	<ul style="list-style-type: none"><li>• Wind must be blowing to produce electricity.</li><li>• Birds may be harmed by spinning blades.</li><li>• No warming gases are produced.</li></ul>

- 1 The student used the information in the research to conclude that wind energy is cleaner than fossil fuel energy.**

**The evidence that wind energy is cleaner than fossil fuel energy is that wind energy is**

- Ⓐ a renewable energy source that reduces local air quality.
- Ⓑ a renewable energy source that improves local air quality.
- Ⓒ a nonrenewable energy source that reduces local air quality.
- Ⓓ a nonrenewable energy source that improves local air quality.

- 2 Identify the positive effects the use of solar panels has on the environment.**

**Select three.**

- Ⓐ conserves nonrenewable resources
- Ⓑ increases the need for renewable energy
- Ⓒ improves the quality of air in the atmosphere
- Ⓓ increases the use of nonrenewable resources
- Ⓔ generates electricity from a renewable resource

**3 The student listed energy sources that would be best to power schools and homes.**

**Identify the energy source that has the greatest negative effect on the atmosphere.**

- Ⓐ nuclear
- Ⓑ biomass
- Ⓒ fossil fuels
- Ⓓ hydroelectricity

**4 The student determined that a hydroelectric dam would affect the environment.**

**Select a set of positive and negative effects that a hydroelectric dam would have on the environment.**

- Ⓐ Positive effect: resources are readily available  
Negative effect: on aquatic animals
- Ⓑ Positive effect: resources are readily available  
Negative effect: on the geosphere
- Ⓒ Positive effect: resources will run out in a few years  
Negative effect: on land animals
- Ⓓ Positive effect: resources need to be constantly replaced  
Negative effect: on the atmosphere

**5 Part A**

**The student's research included the use of fossil fuels to power homes and vehicles.**

**Identify words or phrases that describe fossil fuels.**

**Select three.**

- Ⓐ renewable
- Ⓑ nonrenewable
- Ⓒ sources of energy
- Ⓓ made from rock layers
- Ⓔ removed from the ground

**Part B**

**The use of fossil fuels negatively affects the environment by**

- Ⓐ increasing pollution in the air.
- Ⓑ decreasing the need for power plants.
- Ⓒ increasing available energy resources.
- Ⓓ decreasing the need to use wind energy.

**6 Identify the positive and negative effects of using nuclear energy to power large cities.**

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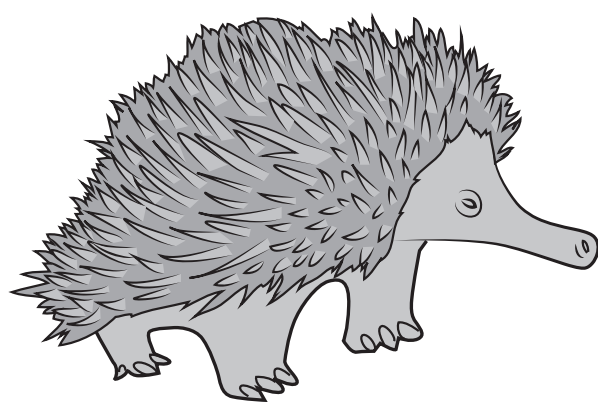
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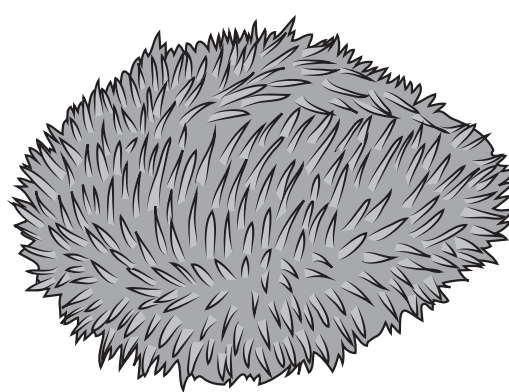
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Read all of the information. Use the information to answer the questions.

A family went to the local zoo and observed two animals from different environments that have spikes all over their bodies. One of the animals lives on land. The family spoke to a zookeeper to obtain more information about this animal. The zookeeper explained that the land animal they observed is called an echidna (i-'kid-nə). The echidna is covered in spikes that are longer than its normal fur, and the spikes are made up of the same material as human fingernails. While the fur of the echidna helps it stay warm, the longer spikes are hard and form a sharp point at the ends. The echidna moves slowly, so when it is threatened, it rolls into a ball or buries itself in a shallow hole so that only its spikes are exposed. The zookeeper showed the family a diagram of the echidna before and after it had rolled into a ball.



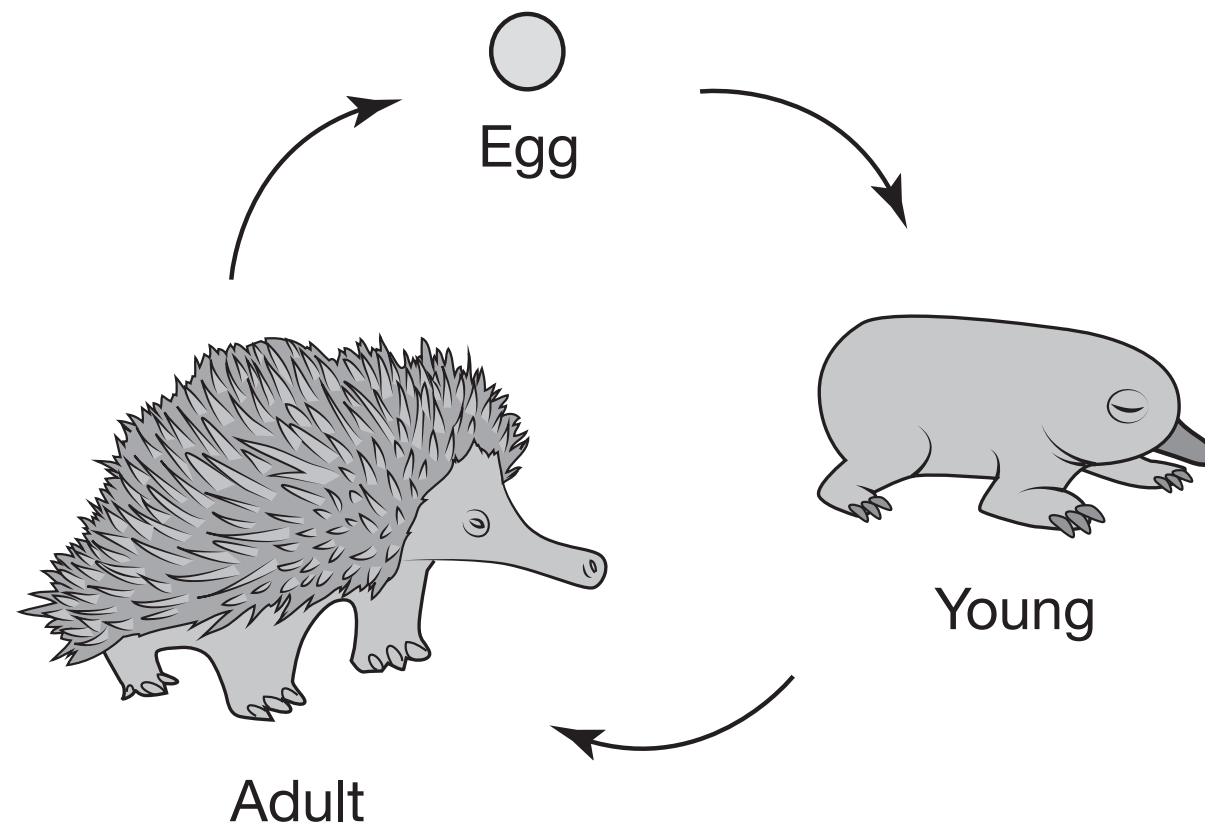
Echidna



Echidna Rolled into  
a Ball

The zookeeper then showed them a diagram of the echidna's life cycle and explained that echidnas are monotremes. Monotremes are mammals that lay eggs.

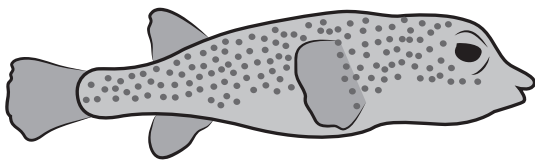
### LIFE CYCLE OF THE ECHIDNA



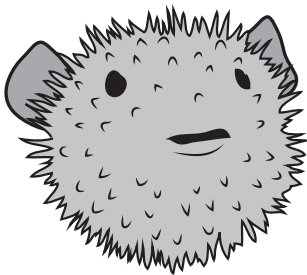
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Echidnas in the wild are most often found in open woodlands or grasslands where they can live up to 45 years. Their pointy noses have the ability to sense electrical signals from insects such as ants and termites. Once they sense the insects underground, they dig with long, sharp claws. Then they pick up the insects with their long tongues and grind them on tooth pads inside their mouths.

The zookeeper then took the family to the aquarium area to observe an animal that also has spikes but lives in an underwater environment. This animal is called the spotted porcupinefish (pôr-kyə-pîn-fish). The adult usually has a long spotted body and is about 90 centimeters (cm) long with small fins. The spikes of the adult fish lay flat against its body until it is threatened. When that happens, the spotted porcupinefish inflates its body, causing its spikes to stick out. The spotted porcupinefish can inflate itself up to three times its normal size. The zookeeper showed the family a diagram of a spotted porcupinefish before and after it has inflated.

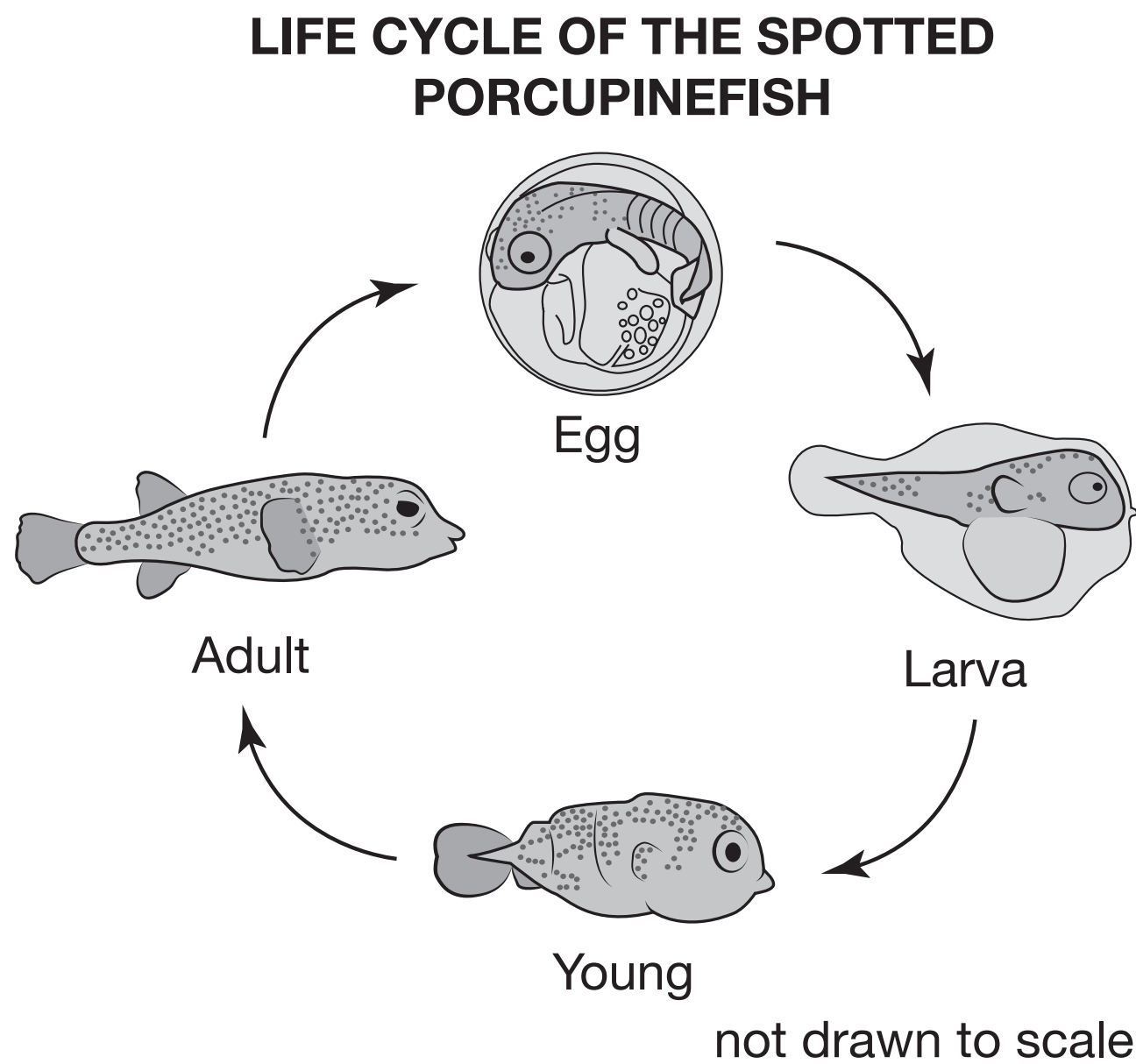


Spotted Porcupinefish



Spotted Porcupinefish  
Inflated

The zookeeper then showed the family a diagram of the life cycle of the spotted porcupinefish.



The zookeeper explained that the adult spotted porcupinefish can live up to 10 years and is found in underwater caves or around coral reefs where it searches for food sources.

**7 Which actions are likely to occur due to the ability of the echidna to sense electrical signals?**

**Select two.**

- Ⓐ digging into the ground
- Ⓑ finding food sources
- Ⓒ sensing predators
- Ⓓ rolling into a ball
- Ⓔ locating shelter

**8 An echidna senses signals from**

- Ⓐ food sources using its spikes, then uses its claws to dig for food.
- Ⓑ food sources using its pointy nose, then uses its claws to dig for food.
- Ⓒ predators using its sharp claws, then uses its claws to scare away predators.
- Ⓓ predators using its spikes, then uses its claws to scare away predators.

**9 What most likely causes the echidna to roll into a ball when threatened?**

- Ⓐ The digestive system sends a signal to the brain which is processed over time.
- Ⓑ The circulatory system sends a signal to the brain where it is stored in memory.
- Ⓒ The sensory receptors send a signal to the brain which immediately responds.
- Ⓓ The skeletal system sends a signal to the brain which is processed over time.

**10 The difference in the life cycles of the organisms is that the**

- Ⓐ spotted porcupinefish has a larval stage, while the echidna has a different means of protection.
- Ⓑ spotted porcupinefish has an egg stage, while the echidna has a different end to its life cycle.
- Ⓒ spotted porcupinefish has a growth stage, while the echidna has a different means of protection.
- Ⓓ spotted porcupinefish has a larval stage, while the echidna has a different end to its life cycle.

**11 How would a reduced ability to produce eggs affect both the echidna and the spotted porcupinefish?**

**Select two.**

- Ⓐ There would be fewer larvae.
- Ⓑ There would be fewer adults.
- Ⓒ There would be an increase in growth.
- Ⓓ There would be a greater number of young.
- Ⓔ There would be more food resources available.

[illegible]



**You have come to the end of Section 3 of the test. Review your answers from Section 3 only.**



**GO ON TO NEXT PAGE**

# Section 4

**Directions:**

Today, you will take Section 4 of the MISA Practice Test.

Read each question. Then, follow the directions to answer each question. Mark your answers by completely filling in the circles in your test book. Do not make any pencil marks outside of the circles. If you need to change an answer, be sure to erase your first answer completely.

Some of the questions will ask you to write a response. Write your response in the space provided in your test book. Be sure to keep your response within the space provided. Only responses written within the space provided will be scored.

If you do not know the answer to a question, you may go on to the next question. If you finish early, you may review your answers and any questions you did not answer in this Section ONLY. Do not go past the stop sign.

**Read all of the information. Use the information to answer the questions.**

### **Simple Cardboard Invention May Help Billions**

Not every useful invention has to be developed over many years and cost a lot of money to make. Sometimes the simplest of ideas can improve our lives profoundly. All it takes is a little imagination and a desire to make a difference!

Ask John Bohmer, whose weekend project with his two daughters may end up not only make a significant difference in helping our environment but also improving the lives of 3 billion people worldwide.

John's invention is a solar-powered oven made from cardboard. Dubbed<sup>1</sup> Kyoto Box, it is composed of two cardboard boxes, one inside the other, covered with a sheet of acrylic glass—to help trap the heat from the sun. The inner box is painted with black paint, which absorbs the heat, while the box on the outside is lined with silver foil that reflects any energy that escapes toward the black box. This helps to create a concentrated source of energy that can be used for cooking.

The simple oven costs only \$7 USD to manufacture<sup>2</sup> and can easily be put together in any cardboard factory. With the capability of reaching high temperatures, it can be used to boil water, cook rice and casserole—and even bake bread.

It is estimated that over 3 billion people living in developing countries use chopped firewood for their main fuel, generating an estimated 2 tons of dangerous carbon dioxide emissions a year.

While solar cookers are not a new idea, this is the first time someone has come up with one that works and is cheap enough to be adapted on a large scale.

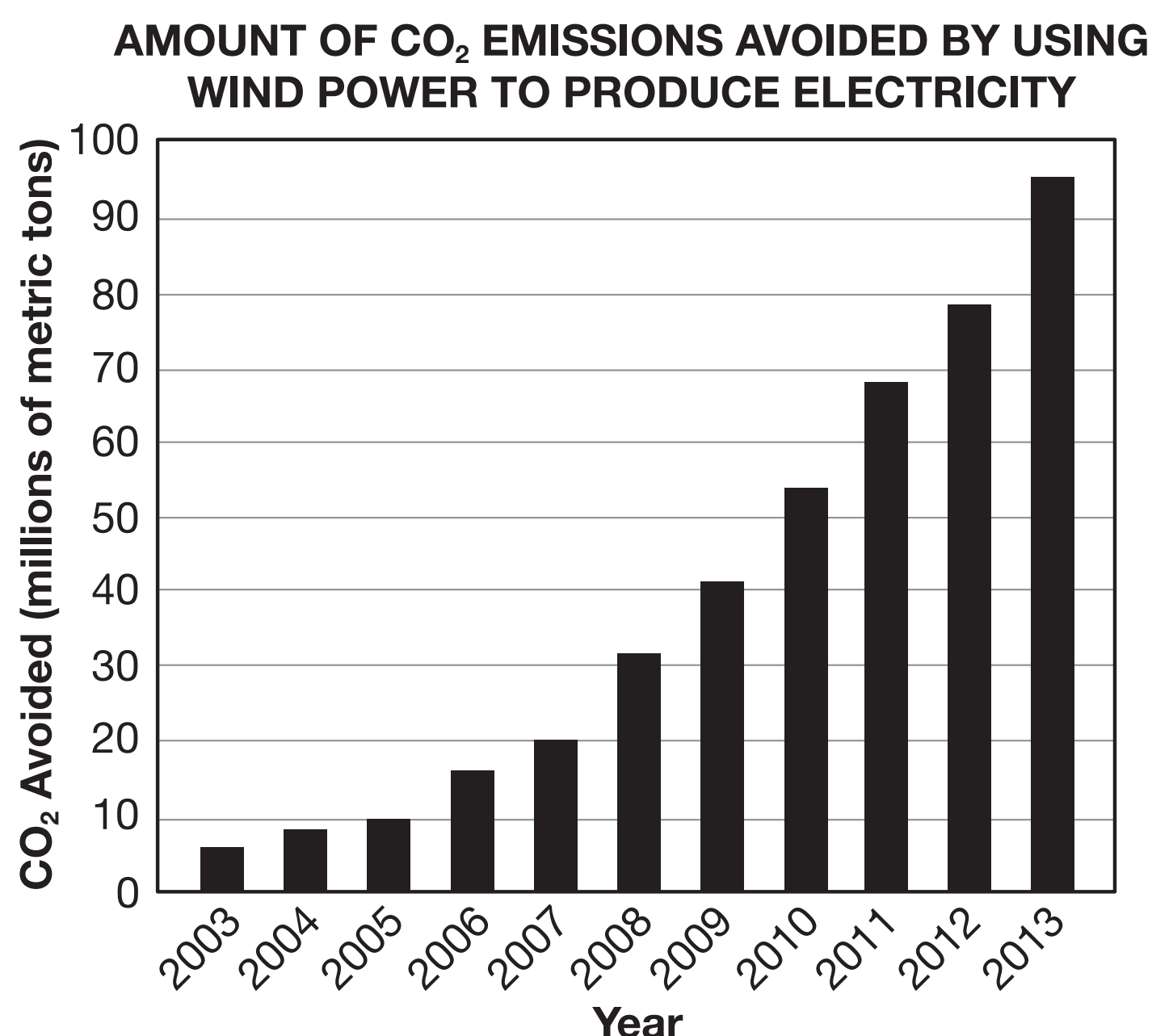
"Simple Cardboard Invention May Help Billions" – Meera Dolasia, DOGO News, © 2009.  
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<sup>1</sup>**Dubbed**—named

<sup>2</sup>**manufacture**—make

After reading about the solar-powered ovens, a student was curious about other technologies that help reduce carbon dioxide (CO<sub>2</sub>) emissions. The student found a credible website that stated that power plants that produce electricity from fossil fuels are a major source of carbon dioxide emissions. Using wind turbines to produce electricity lessens the amount of electricity needed from plants powered by fossil fuels. The use of an average-sized wind turbine to produce electricity can avoid the production of over 3,300 metric tons of carbon dioxide each year. That is equal to the amount of carbon dioxide emitted from 500 cars in one year. The graph shows that from 2003 through 2013 the increasing use of electricity produced by wind power has reduced carbon dioxide emissions by an amount equal to taking 16.9 million cars off of the road.



Producing electricity from wind turbines instead of at plants powered by fossil fuels seems likely to help reduce the amount of carbon dioxide in the air. However, while wind turbines do not produce carbon dioxide, they do require the use of large areas of land.

**1 John Bohmer's invention is inexpensive technology that uses**

- Ⓐ renewable resources to allow food to last longer.
- Ⓑ renewable resources to heat food before it is eaten.
- Ⓒ nonrenewable resources to protect food from germs.
- Ⓓ nonrenewable resources to make appliances more affordable.

**2 Which environmental impacts would occur if John Bohmer's invention were used more often?****Select three.**

- Ⓐ an increased use of fossil fuels
- Ⓑ a decreased use of fossil fuels
- Ⓒ more use of renewable resources as energy sources
- Ⓓ more use of nonrenewable resources as energy sources
- Ⓔ an increased amount of carbon dioxide in the atmosphere
- Ⓕ a decreased amount of carbon dioxide in the atmosphere

**3 The increased use of the invention would most likely increase**

- Ⓐ the need to chop down trees.
- Ⓑ the need to dig for fossil fuels.
- Ⓒ the use of nonrenewable resources.
- Ⓓ the quality of the air in the atmosphere.

**4 Use the evidence to determine the amount by which emissions of carbon dioxide would be reduced if 5 wind turbines were used to generate electricity for one year.**

**The effect of using 5 wind turbines to generate electricity for one year is equal to reducing how many metric tons of carbon dioxide emitted by how many cars?**

- Ⓐ 6,600 metric tons of carbon dioxide from 1,000 cars
- Ⓑ 9,900 metric tons of carbon dioxide from 1,500 cars
- Ⓒ 13,200 metric tons of carbon dioxide from 2,000 cars
- Ⓓ 16,500 metric tons of carbon dioxide from 2,500 cars

**5 A conclusion that can be made based on the evidence from the article is that John Bohmer’s invention would most likely**

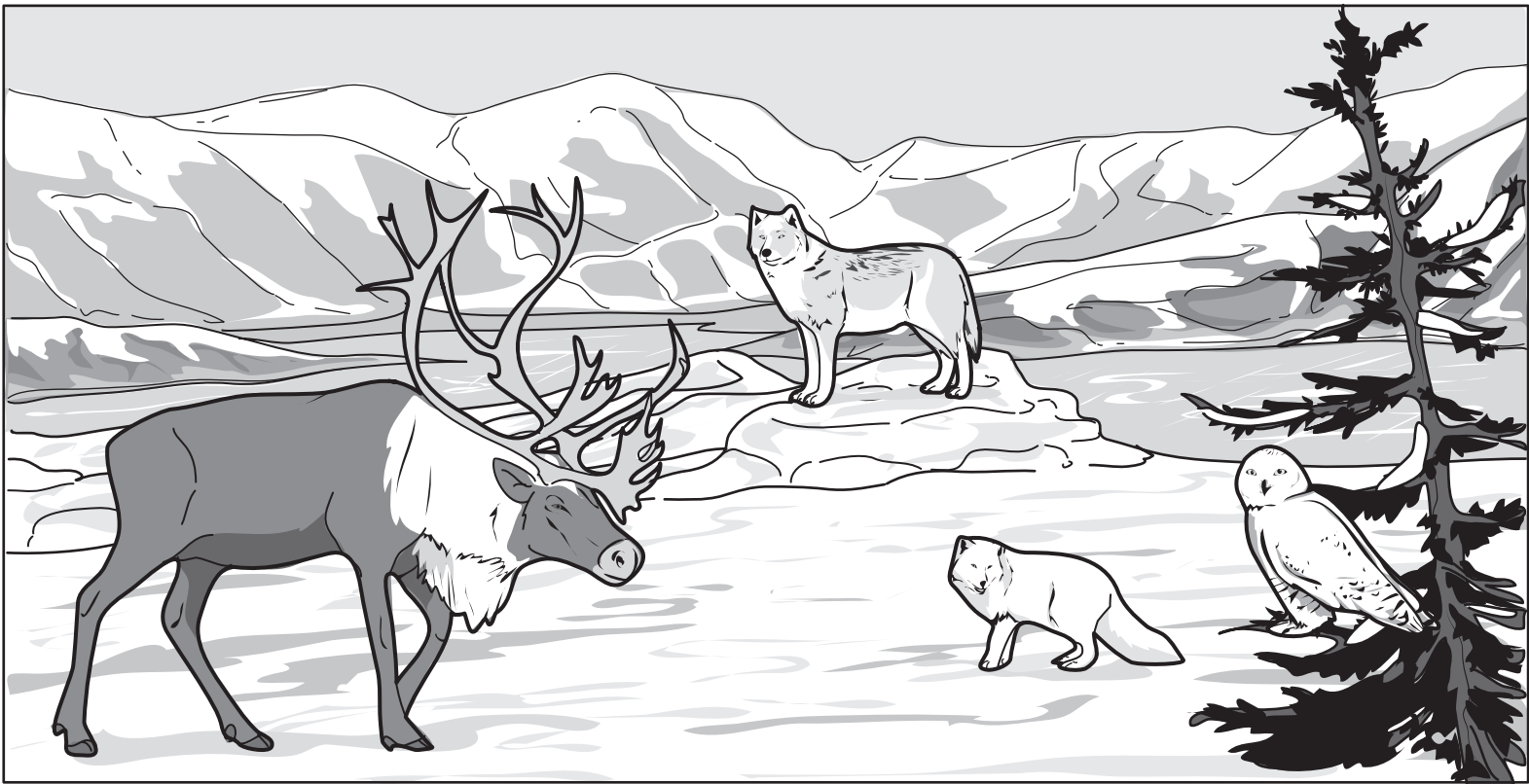
- Ⓐ increase the use of nonrenewable resources to produce electricity.
- Ⓑ decrease the use of nonrenewable resources to heat food sources.
- Ⓒ decrease the air quality in order to obtain nonrenewable resources.
- Ⓓ increase the use of renewable resources while absorbing heat from the atmosphere.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Read all of the information. Use the information to answer the questions.

During a unit on the environment, students researched ecosystems such as rain forests, deserts, and tundras. A group of students researched tundras and the many animals that live in a tundra. The students questioned which characteristics of the animals in the tundra help them to survive.

The students chose four animals that are found in a tundra environment and researched information about each, shown in the table.

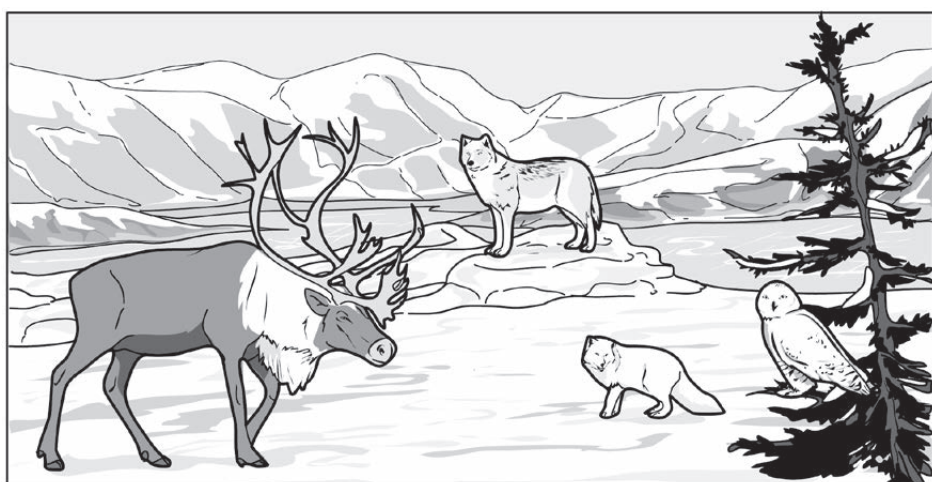


Name	Observations
Caribou	<ul style="list-style-type: none"><li>• herbivores</li><li>• migrate north in summer</li><li>• migrate south in winter</li><li>• large hooves</li><li>• male and females have antlers</li><li>• coats are white in winter</li><li>• coats are brown in summer</li></ul>
Arctic Wolf	<ul style="list-style-type: none"><li>• carnivores</li><li>• live alone or in packs of six</li><li>• ears are smaller than the gray wolf's</li><li>• legs are shorter than the gray wolf's</li><li>• coats are thick and white</li></ul>
Arctic Fox	<ul style="list-style-type: none"><li>• omnivores</li><li>• live in burrows</li><li>• white coat in winter</li><li>• brown or gray coat in summer</li></ul>
Snowy Owl	<ul style="list-style-type: none"><li>• carnivores</li><li>• feathers turn whiter as they get older</li><li>• hunt at night and day</li><li>• excellent hearing and eyesight</li></ul>

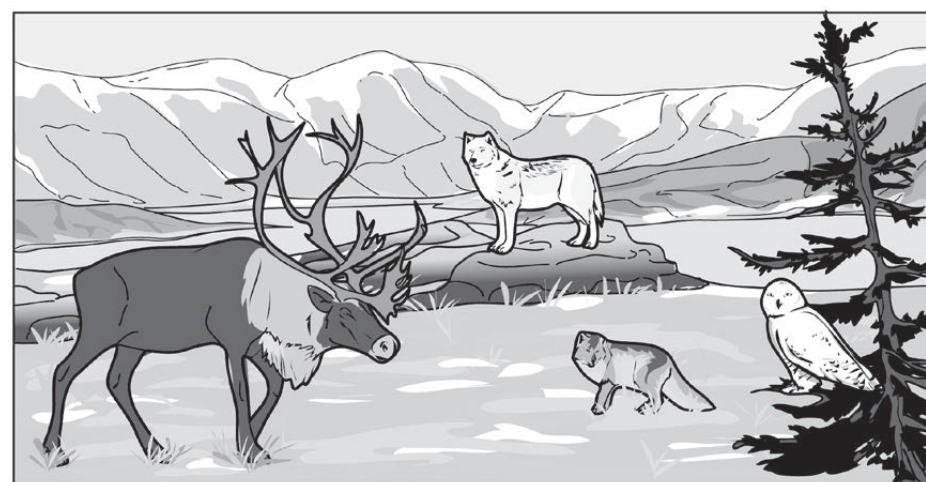
While researching tundra animals, the students found that the animals' environment changes. Higher temperatures have reduced the amount of snow present in the tundra, leading to more springlike and summerlike days. The students investigated how changes to the environment may affect the animals that live in a tundra.

To observe the changes to the environment and how the animals would appear during each season, the students constructed four diagrams, as shown.

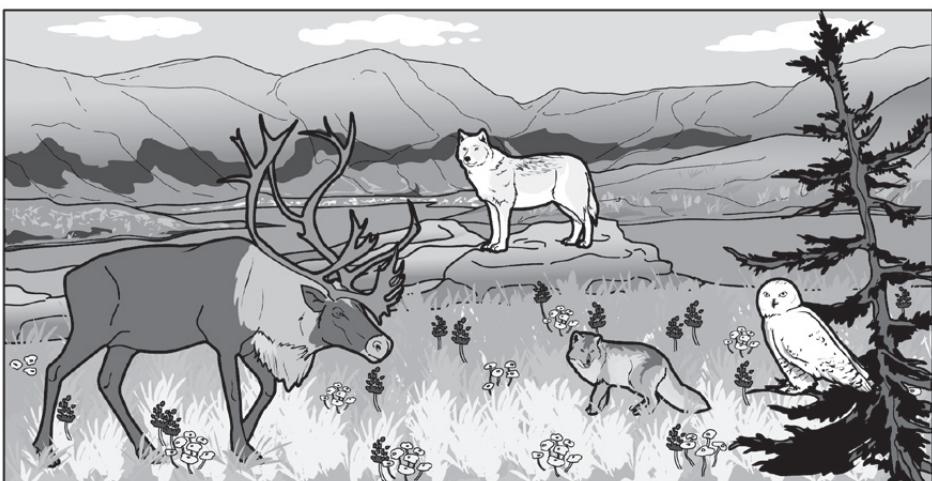
WINTER



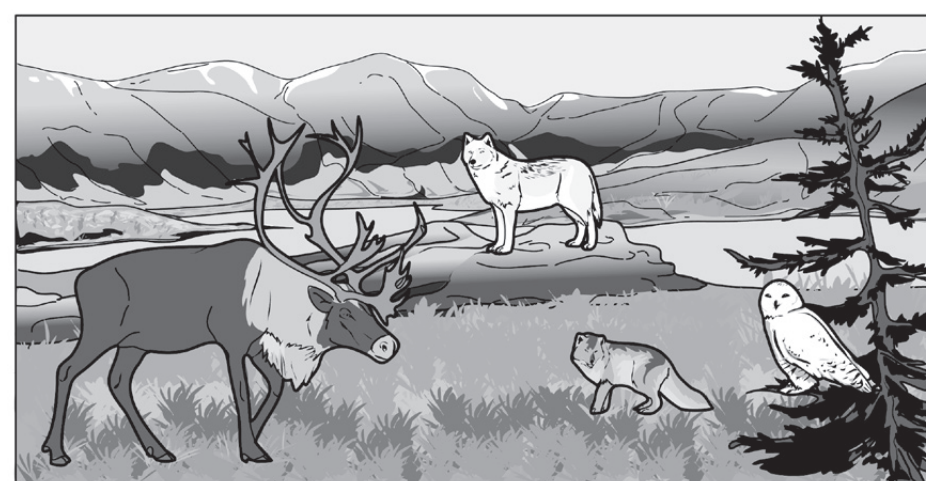
SPRING



SUMMER

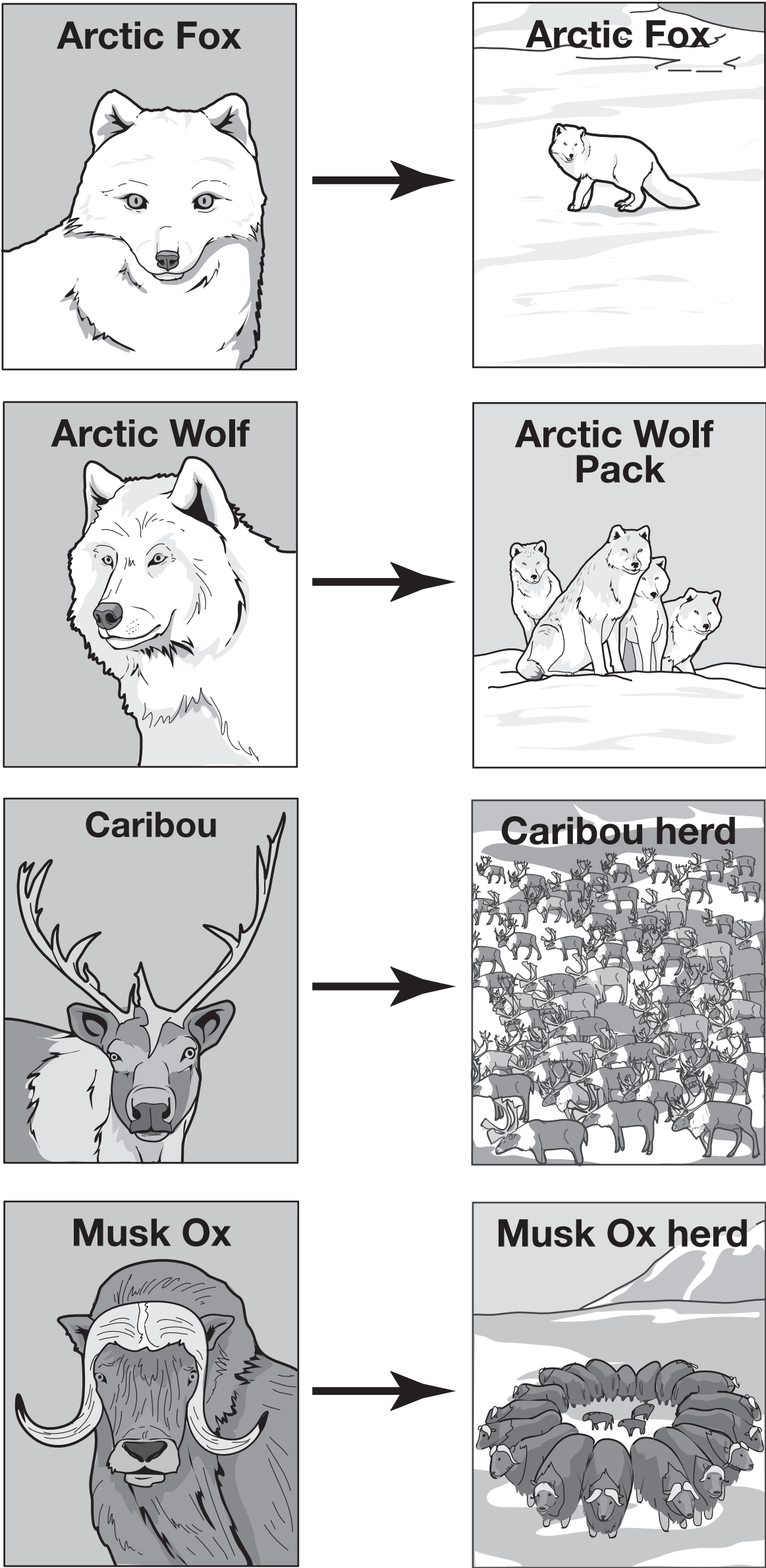


FALL



The research indicated some tundra animals live in large groups while others live alone or in small groups. The research also indicated that prey animals tend to live in larger groups and predators live in smaller groups.

The students then constructed diagrams of the Arctic Fox, Arctic Wolf, Caribou, and Musk Oxen to observe whether the animals live alone, in small groups or in large groups, shown as follows.



- 7 The students stated that even though the organisms have different characteristics that enable them to survive in a tundra environment, all the organisms have basic needs.**

**Determine the basic needs that organisms require.**

**Select three.**

- Ⓐ feathers
- Ⓑ food
- Ⓒ fur
- Ⓓ shelter
- Ⓔ water

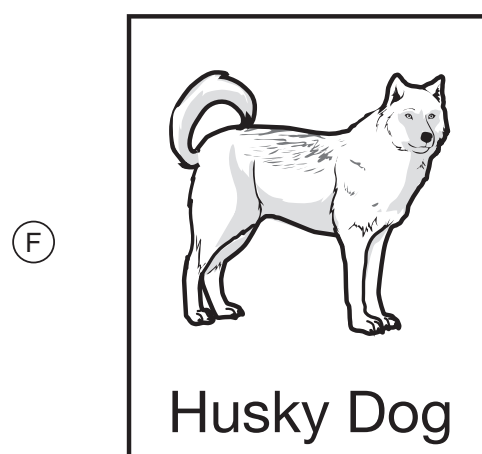
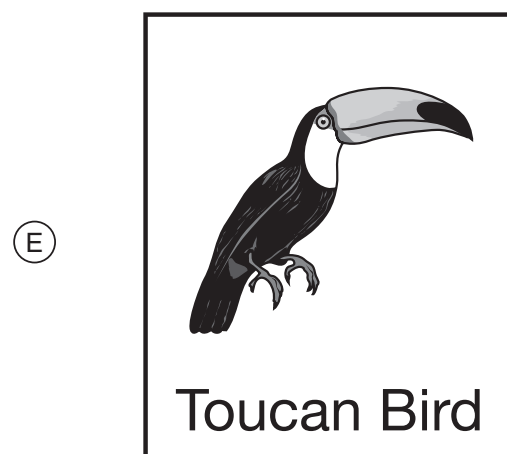
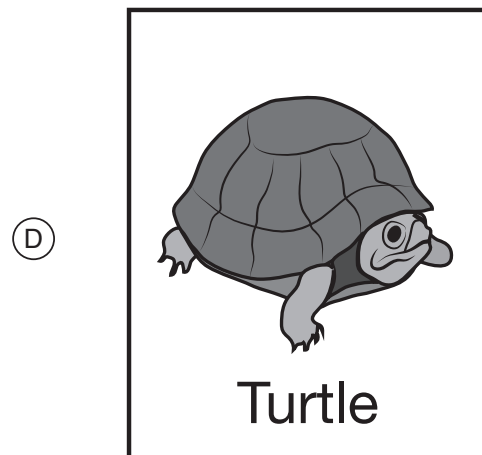
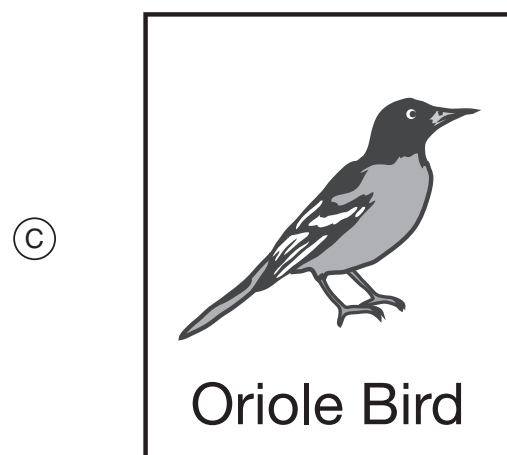
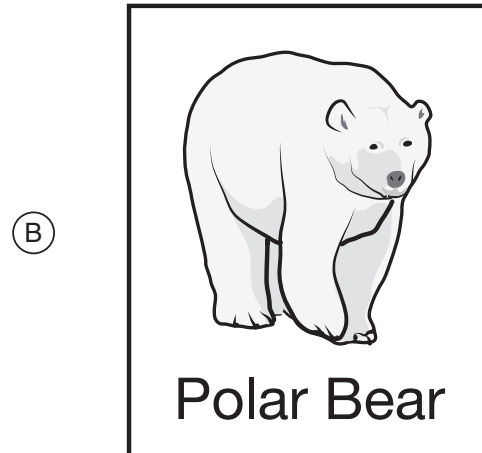
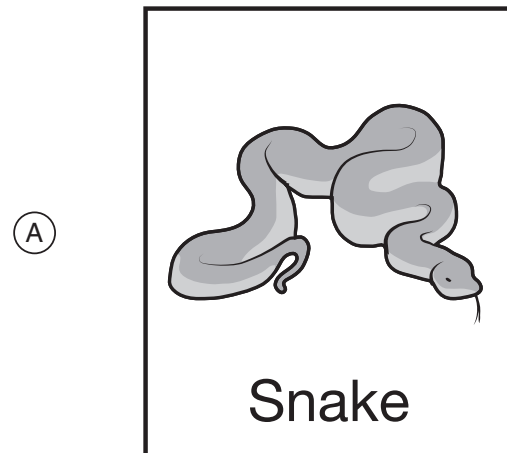
- 8 The students claimed that the arctic fox has a characteristic to help it survive from winter to summer.**

**The characteristic that best helps the arctic fox survive is the ability to**

- Ⓐ be more visible to prey.
- Ⓑ find more water sources.
- Ⓒ be less visible to predators.
- Ⓓ find fewer burrows for shelter.

9 Based on evidence, the students questioned whether other animals would be able to survive in a tundra environment.

Select the two animals that would most likely be able to survive in a tundra environment.



- 10 The students claimed that animals that live in smaller groups need to develop other characteristics in order to survive in their environment.**

**The animals that use blending into the environment instead of living in large groups as a way of survival are**

- Ⓐ caribou and arctic fox.
- Ⓑ snowy owl and caribou.
- Ⓒ musk ox and arctic wolf.
- Ⓓ arctic fox and arctic wolf.

- 11 The circling behavior of the musk oxen most likely benefits the herd by**

- Ⓐ providing more food for the herd.
- Ⓑ finding better shelter for the herd.
- Ⓒ reducing the number of young in the herd.
- Ⓓ protecting the smaller animals in the herd.

[illegible]



**You have come to the end of Section 4 of the test. Review your answers from Section 4 only.**



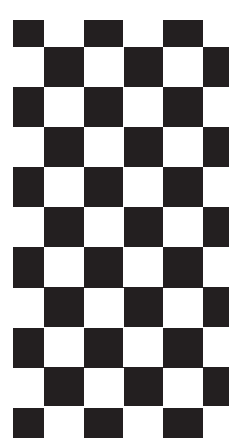




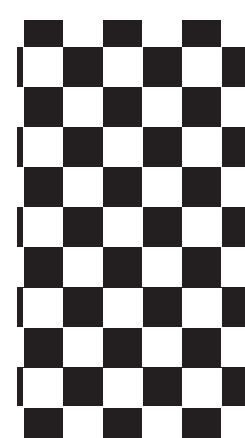




# Maryland Comprehensive Assessment Program



Grade 5  
MISA  
**Practice Test**



*Large Print*

