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Student Name _____

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B

Last Name										First Name										MI
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C

Place the Student ID Label Here

D **Gender**

○ Female ○ Male

E **Date of Birth**

Day		Month	Year			
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2	2	○ Mar	2		2	2
3	3	○ Apr			3	3
	4	○ May			4	4
	5	○ Jun			5	5
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	9	○ Oct		9	9	9
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MCAP
Maryland Comprehensive Assessment Program

Grade 5
MISA

Practice Test

Large Print

School Use Only

F **SASID**

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SERIAL #

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Section 1

Directions:

Today you are going to take Section 1 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.

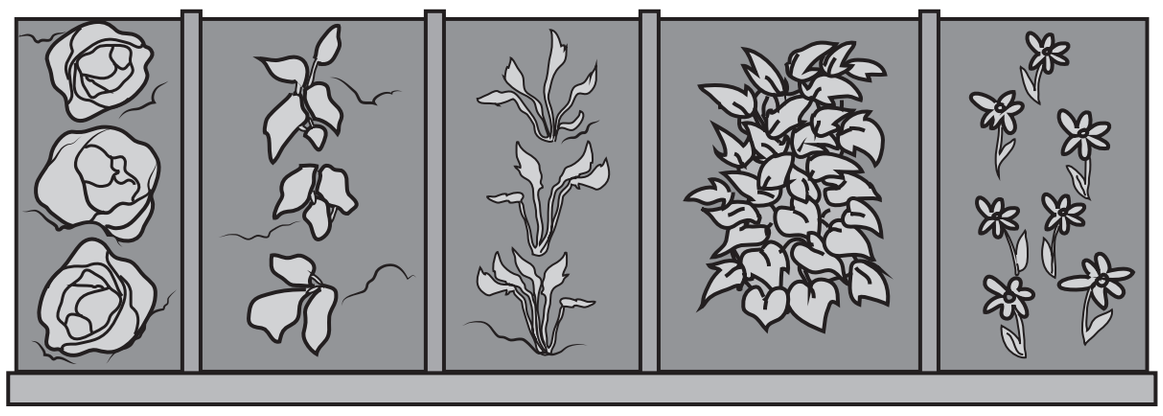
Some of the questions will ask you to write a response. Write your response in the space provided in your test book. Be sure to keep your response within the space provided. Only responses written within the space provided will be scored.

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.

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 below.

THE SCHOOL GARDEN



Lettuce Radishes Carrots Cucumbers Flowers

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.

GO ON ▶

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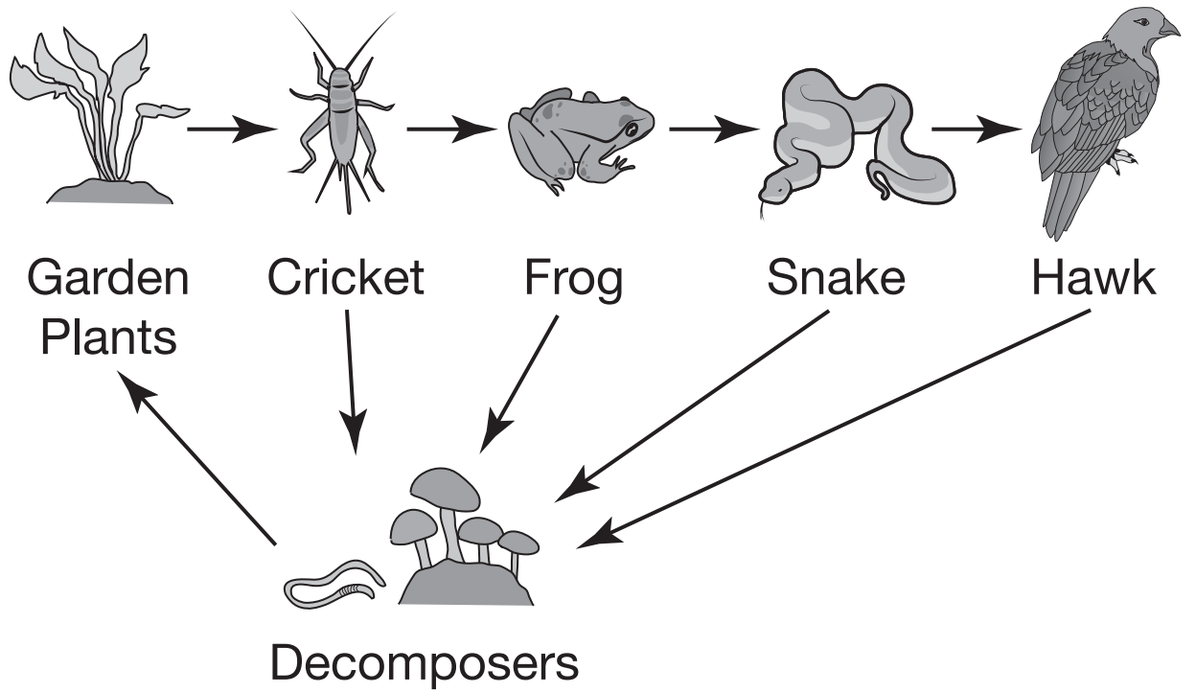
SERIAL #

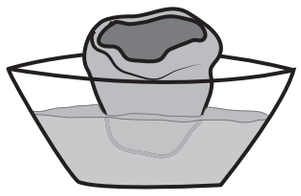
After the plants started to grow, the students noticed organisms that were not there before the garden was planted. The students learned that over time the garden had become a small ecosystem. To demonstrate the flow of energy in the garden ecosystem, the students drew a diagram and included decomposers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

ENERGY FLOW IN A GARDEN ECOSYSTEM



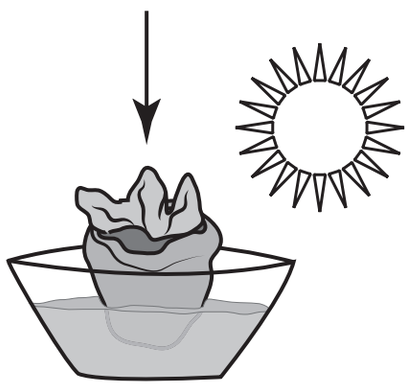
After the students rinsed off the fully grown lettuce, the teacher explained that some plants, such as lettuce, can be regrown from cuttings. The teacher then cut the lettuce, keeping the stem, and placed it in a bowl of water on a windowsill. The students added water to the bowl once a day for ten days.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

HOW TO REGROW LETTUCE

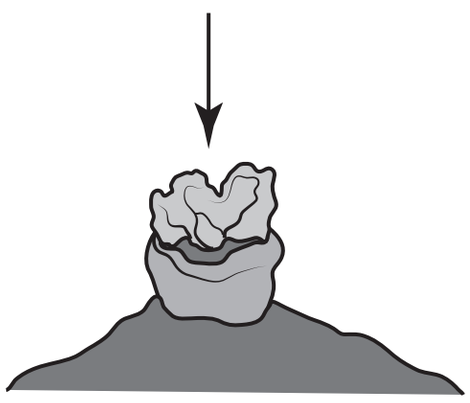


Place the stem of the lettuce in a bowl of water with the top exposed to air.

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.

GO ON ▶

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

The plant matter was <u>most likely</u> 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 all that apply.

Ⓐ 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.

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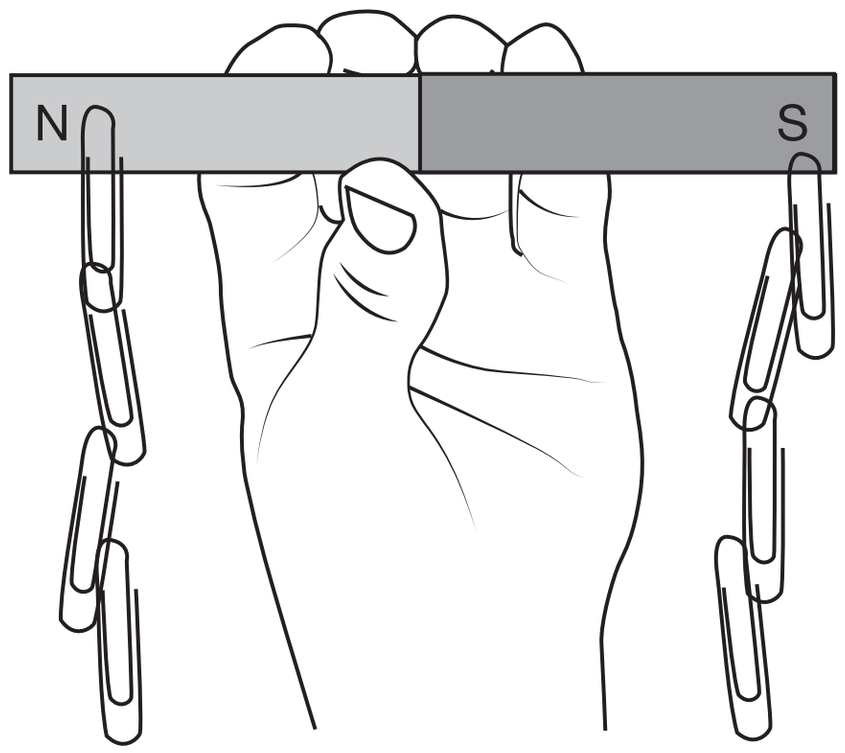
6 Use evidence from the diagram to describe how matter is cycled through the garden ecosystem. In your description, be sure to include the roles of the organisms.

GO ON ▶

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

During an investigation in a science class, a teacher held a bar magnet above a pile of steel paper clips on a lab table and then moved the magnet toward the pile. When the magnet was approximately 5 centimeters above the pile, a few paper clips moved off the table toward the bar magnet. The teacher raised the bar magnet so the students could observe that four steel paper clips were attached to each end of the magnet, as shown in the following diagram.



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One of the students asked whether magnets affect objects made of all materials. To further investigate the student's question, an investigation using bar magnets held above objects made of various materials was conducted. The students observed which objects were attracted by the magnets and recorded their observations in a table like the following table.

WHAT MATERIALS ARE ATTRACTED BY MAGNETS?

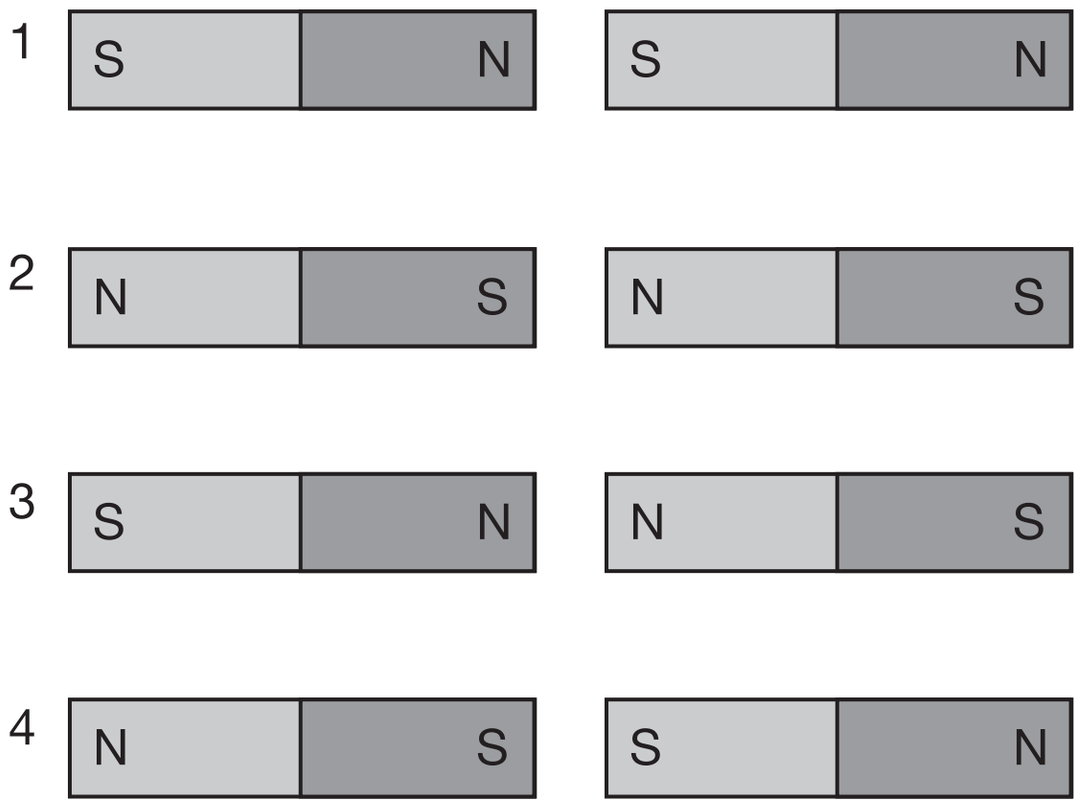
Object	Attracted by Magnet
Wood pencil	No
Plastic ruler	No
Steel paper clips	Yes
Paper cups	No
Iron nails	Yes
Copper pennies	No
Aluminum foil	No

GO ON ▶

Section 1

While investigating magnets, the students observed that when the poles of two magnets were placed close to each other, the magnets either attracted or repelled each other. The students then posed the question: When will the magnets be attracted by each other? The students designed a second investigation where two magnets were pushed slowly toward each other, as shown in the following diagram.

MAGNET INVESTIGATION



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7 Which question did the students <u>most likely</u> want to answer by conducting the "Objects Attracted by Magnets" investigation?

Ⓐ Are large objects attracted by a magnet?

Ⓑ What materials are attracted by magnets?

Ⓒ How far from a magnet can an object be and still be attracted by a magnet?

Ⓓ Does the shape of a magnet affect the objects that will be attracted by a magnet?

8 A student asked if the steel paper clips could be attracted by a bar magnet from a distance greater than 5 centimeters.

The <u>best</u> way to investigate if the paper clips could be attracted from a distance greater than 5 centimeters is to

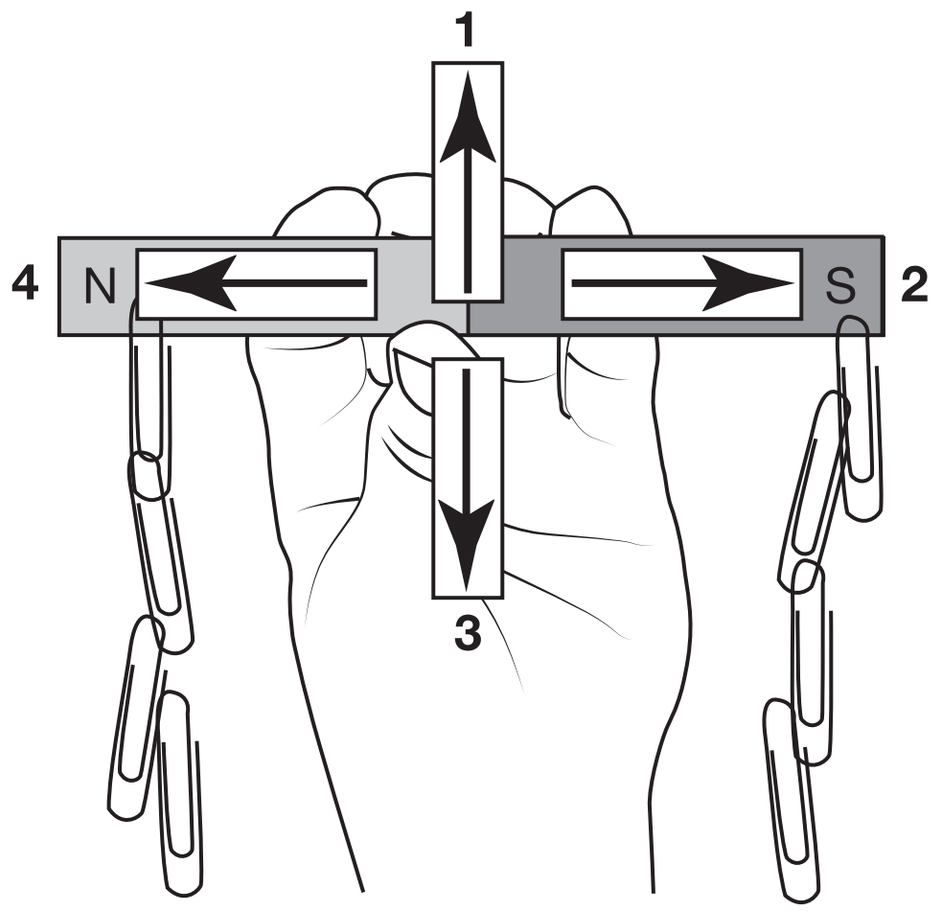
Ⓐ increase the distance of the magnet from the steel paper clips and increase the number of steel paper clips

● Ⓑ decrease the angle of the magnet from the steel paper clips and increase the number of steel paper clips

Ⓒ increase the distance of the magnet from the steel paper clips with the same sized bar magnet

Ⓓ decrease the angle of the magnet from the steel paper clips with the same sized bar magnet

9 In the diagram below, the teacher is holding a bar magnet with steel paper clips attached.



Select the arrow in the diagram that identifies the direction of the force of gravity on the paper clips.

Ⓐ Location 1

Ⓑ Location 2

Ⓒ Location 3

Ⓓ Location 4

10 During the "Magnet Investigation," the students asked if the bar magnets attracted or repelled each other.

Identify the trials in which the magnets repel.

Ⓐ Trial 1 and Trial 2

Ⓑ Trial 2 and Trial 3

Ⓒ Trial 2 and Trial 4

Ⓓ Trial 3 and Trial 4

GO ON ▶

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GO ON TO NEXT PAGE

GO ON ▶

11 The students' four trials with the bar magnets were <u>most likely</u> done to investigate the effects of

Ⓐ the size of the magnets

Ⓑ the shape of the magnets

Ⓒ the strength of like and unlike poles

Ⓓ the placement of like and unlike poles

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SERIAL #

12 Use the data from the "Objects Attracted by Magnets" investigation to explain why the steel paper clips did not need to be in direct contact to be attracted by the bar magnet the teacher used. In your explanation, be sure to include evidence from the students' investigation.

STOP

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

PLEASE DO NOT WRITE IN THIS AREA

SERIAL #

Section 2

Directions:

Today you are going to take Section 2 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.

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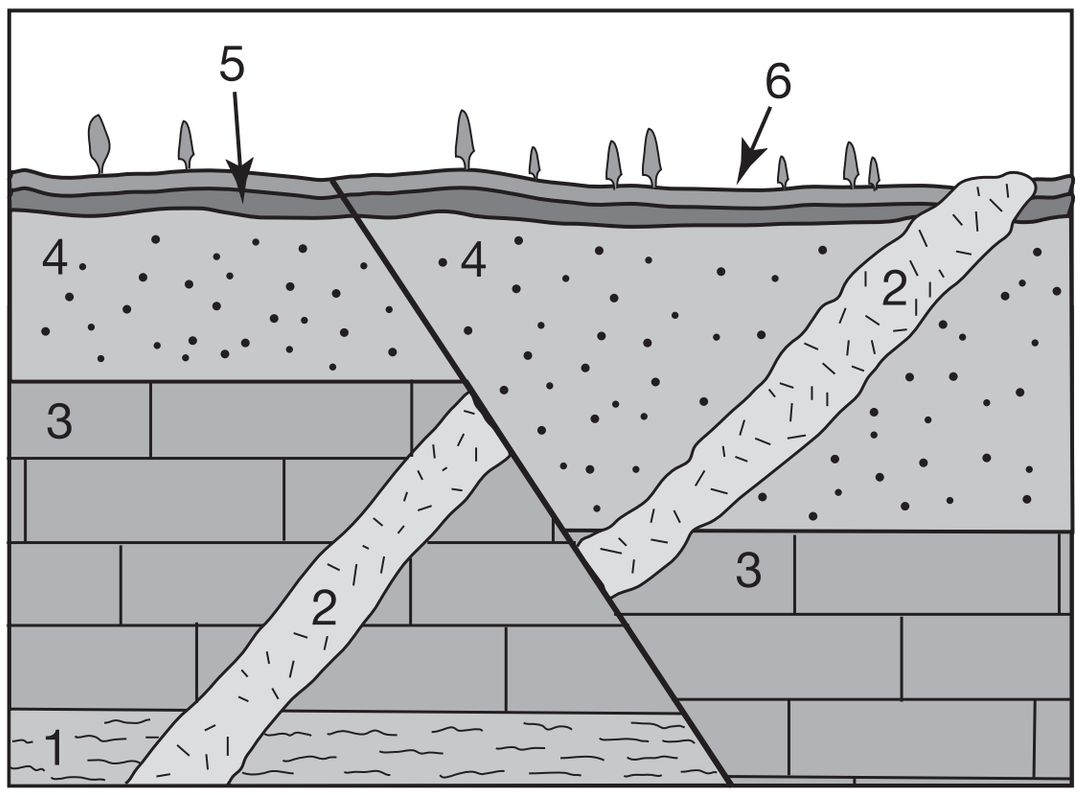
Read all of the information. Use the information to answer the questions.

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.

ROCK LAYERS



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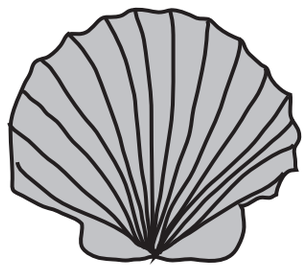
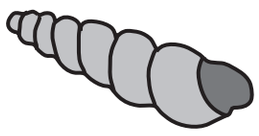
After the field trip to Calvert Cliffs, some students stated that they observed rock layers high up on the cliff face similar to the diagrams they made in their science journals. The rock layers were visible due to their different coloration. The students also observed fossils in some of the rock layers.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

FOSSILS OBSERVED AT CALVERT CLIFFS

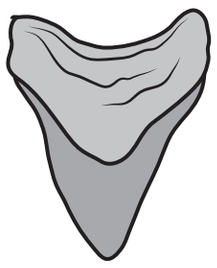


Scallop Shell Fossil

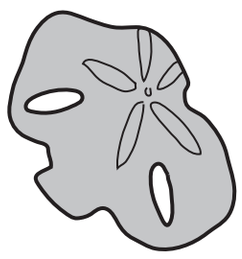
Murex Shell Fossil



Snail Fossil



Shark Tooth Fossil



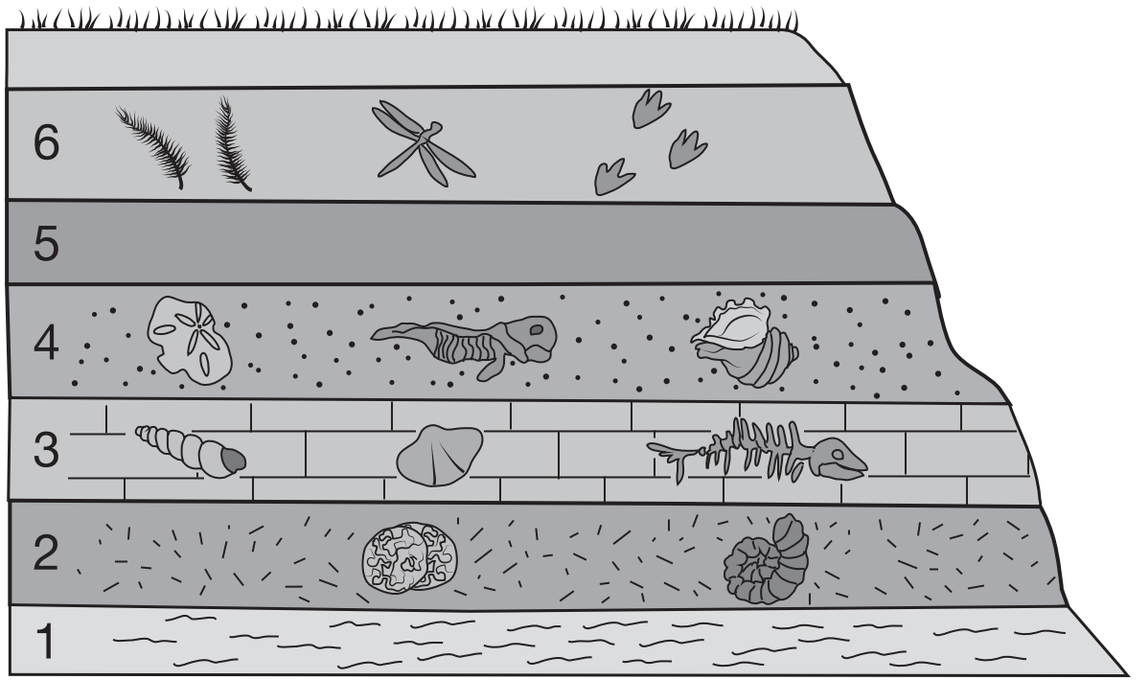
Sand Dollar Fossil

ROCK LAYERS OF CALVERT CLIFFS

GO ON ▶

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



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SERIAL #

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

The event that <u>most likely</u> caused the movement seen 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

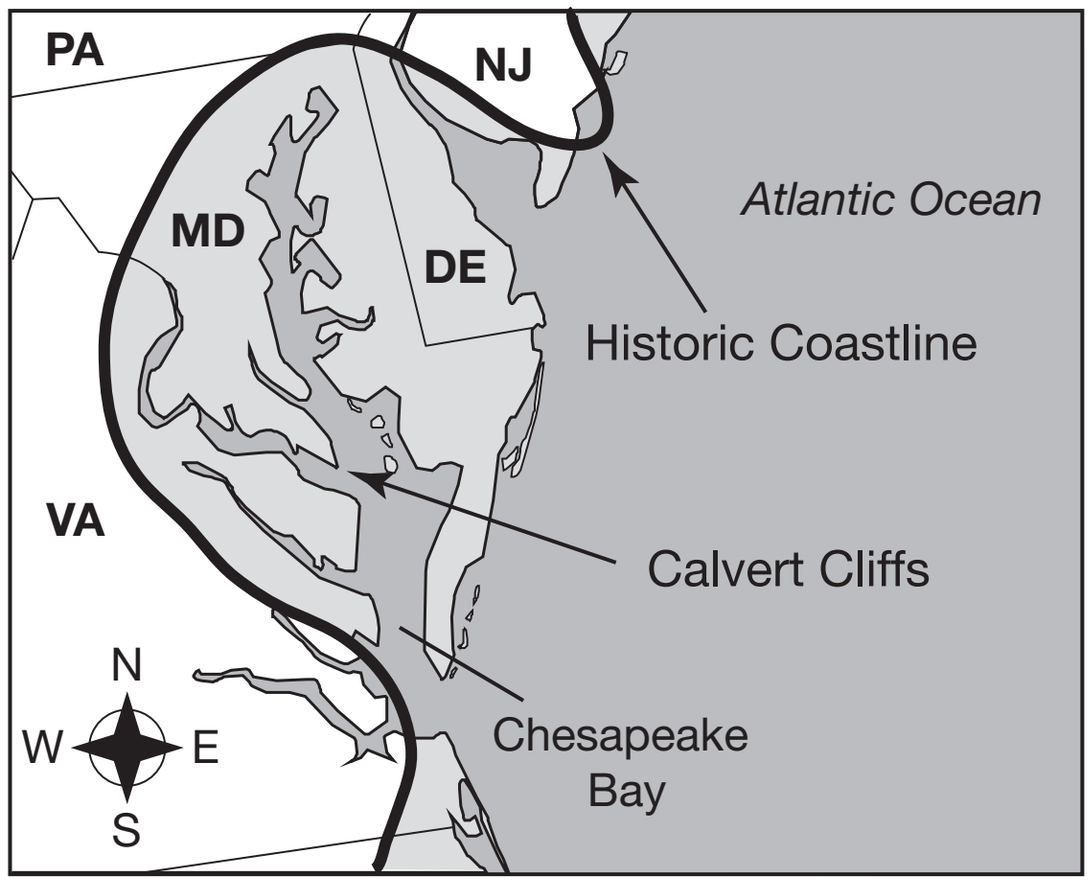
Ⓑ a mountain environment because of the fossil evidence from land mammals

Ⓒ a forest environment because of the fossil evidence from marine organisms

Ⓓ an ocean environment because of the fossil evidence from marine organisms

GO ON ▶

4 One student drew a map, shown below, 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 What evidence can be obtained from the rock layers diagram about the organisms in layer 3?

Ⓐ 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 <u>most likely</u> appeared millions of years ago.

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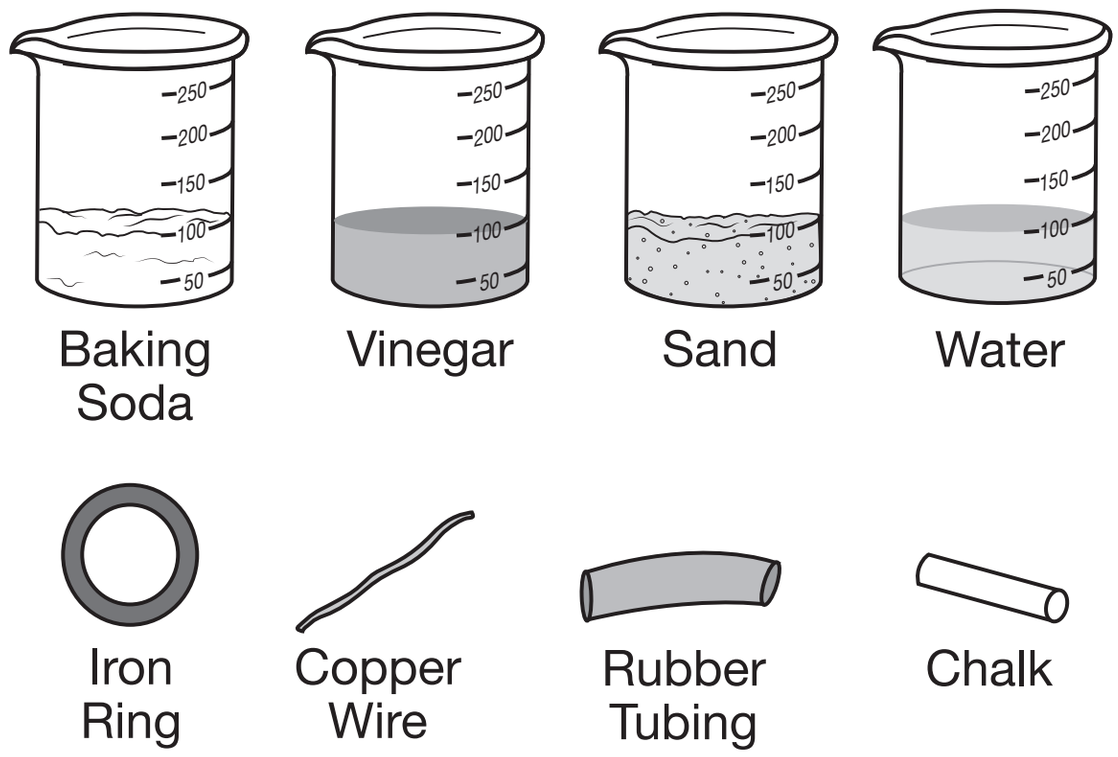
SERIAL #

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.



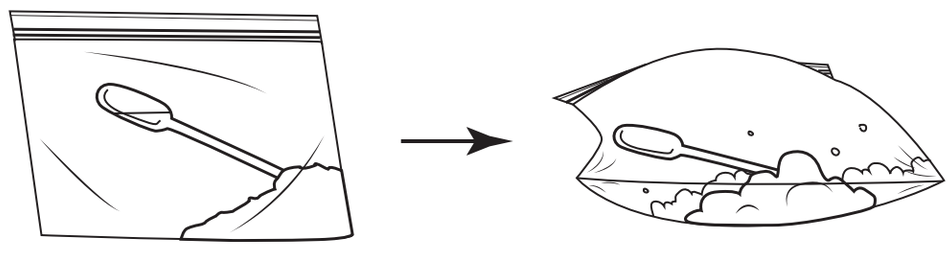
After reviewing the safety instructions with the teacher, the students put on protective goggles and lab coats and proceeded with the investigations. In the first investigation, the students combined vinegar and baking soda and recorded the results in their lab journals. Then they changed the investigation 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.**

GO ON ▶

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

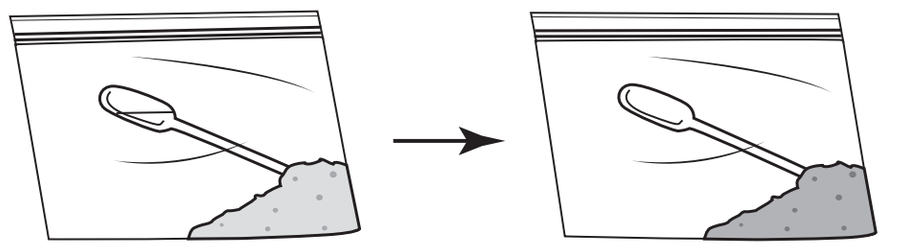


Vinegar + Baking Soda Before Combining

Vinegar + Baking Soda After Combining

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.



Vinegar + Sand Before Combining

Vinegar + Sand After Combining

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

Select all the qualitative properties of the two substances.

Ⓐ vinegar is a liquid

Ⓑ baking soda is white

Ⓒ baking soda is a solid

Ⓓ the volume of vinegar used

Ⓔ mass of the baking soda used

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SERIAL #

8 Part 1

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 2

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 <u>most likely</u> use to sort the liquids?

Select all that apply.

Ⓐ color

Ⓑ mass

Ⓒ hardness

Ⓓ volume

Ⓔ temperature

Section 2

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 all that apply.

Ⓐ 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

GO ON ▶

PLEASE DO NOT WRITE IN THIS AREA

SERIAL #

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 all that apply.

Ⓐ Balance

Ⓑ Microscope

Ⓒ Thermometer

Ⓓ Magnifying glass

Ⓔ Graduated cylinder

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

STOP

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SERIAL #

You have come to the end of Section 2 of the test. Review your answers from Section 2 only.

GO ON TO NEXT PAGE

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SERIAL #

Section 3

Directions:

Today you are going to take Section 3 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.

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SERIAL #

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

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
Biomass	Household garbage, logging and farming leftovers, and food crops are processed into fuels for transportation and to produce electricity.	• Less waste makes it to landfills. • More land is needed for crops. • Burning biomass releases fewer warming gases than burning fossil fuels.
Fossil fuels	Coal, oil, and natural gas are burned to produce electricity and power transportation and other engines.	• A large amount of energy is contained in a small amount of fuel. • The fuel takes millions of years to occur naturally. • Warming gases are released when burned.

GO ON ▶

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.	• Areas where water can be trapped by a dam are limited. • Animals in the water can be harmed near the dam. • No warming gases are produced.
Nuclear	Heat from mined nuclear material boils water. Steam spins turbines to produce electricity.	• Enough electricity is produced to power large cities. • Nuclear waste is very dangerous and must be disposed of by the government. • No warming gases are produced.
Solar	Solar cells formed into panels change sunlight directly into electricity.	• The sun needs to be out to make electricity. • No warming gases are produced.
Wind	Blowing wind spins large windmills connected to electric generators.	• Wind must be blowing to produce electricity. • Birds may be harmed by spinning blades. • No warming gases are produced.

GO ON ▶

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SERIAL #

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 all that apply.

Ⓐ 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 students listed energy sources that would be best to power schools and homes.

Identify the energy source that has the greatest <u>negative</u> 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 <u>positive</u> and <u>negative</u> 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

GO ON ▶

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SERIAL #

5 Part 1

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

Identify words or phrases that describe fossil fuels.

Select all that apply.

Ⓐ renewable

Ⓑ nonrenewable

Ⓒ sources of energy

Ⓓ made from rock layers

Ⓔ removed from the ground

Part 2

The use of fossil fuels <u>negatively</u> 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.

GO ON ▶

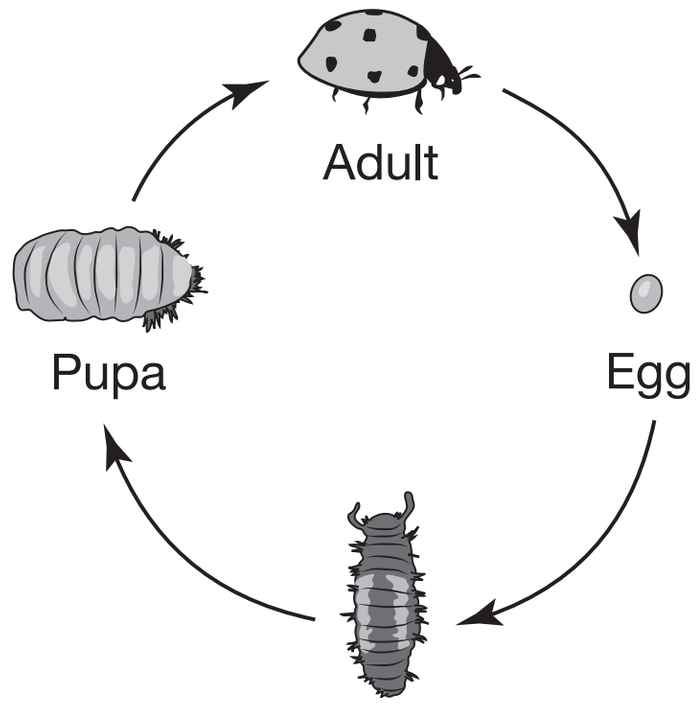
PLEASE DO NOT WRITE IN THIS AREA

SERIAL #

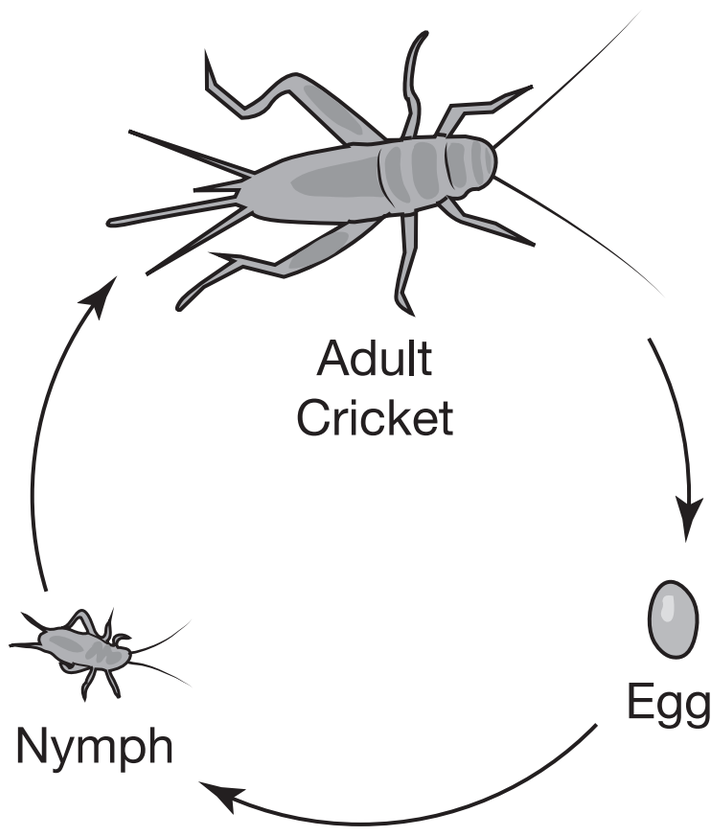
Read all of the information. Use the information to answer the questions.

A group of students observed ladybugs in a school garden and wanted to find out more about insect life cycles. During the research, the students found evidence that as they develop some young insects appear similar to adult insects. Other insects appear different as they go through the stages of development. To do more research about the growth and behavior of insects, the students attended a summer camp, "The Bug Institute," sponsored by a local university. While at the camp, the students kept journals to record their observations. The first activity at the camp involved researching the life cycles of two different insects and drawing diagrams, similar to the diagrams as follows.

LIFE CYCLE OF LADYBUG



LIFE CYCLE OF CRICKET



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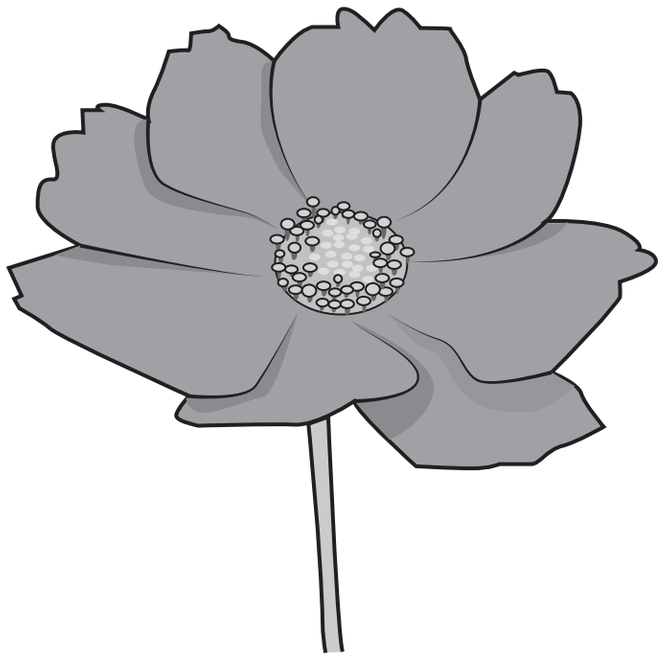
SERIAL #

To learn more about how insects interact with their environment the students performed an investigation with each insect, the details of which are shown.

1. Ladybug investigation:

The students examined adult ladybugs that were placed in a terrarium containing cosmos plants. The flowers of the cosmos plants come in one of three colors: pink, purple, or white. A diagram of a flower from a cosmos plant is shown.

FLOWER OF THE COSMOS PLANT



GO ON ▶

In order to determine if ladybugs were attracted to certain colors, the students carried out the following investigation:

- **Set up a terrarium with three cosmos plants having different colored flowers.**
  - **pink**
  - **purple**
  - **white**
- **Observed the ladybugs moving around the flowers.**
- **Counted the number of ladybugs present on each colored flower every day for five days.**

On day five of the investigation, the data showed that the plant with the white flowers had the greatest number of ladybugs on it. The students concluded the ladybugs were most often attracted to the white flowers.

2. Cricket investigation:

To investigate how crickets respond to different stimuli, the students examined how cotton balls soaked in different solutions would affect the crickets.

The students used a terrarium containing 12 crickets.

Each cotton ball was soaked in solution and placed in the terrarium.

The results are shown.

CRICKET INVESTIGATION RESULTS

Solution	Cricket Motion
None	Neither toward nor away
Peppermint oil	Away
Lemon juice	Away
Vanilla oil	Toward
Cinnamon oil	Away
Pine-scented cleaner	Toward

GO ON ▶

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SERIAL #

7 Select the statement that accurately describes the life cycles in the diagram.

Ⓐ The first stage of an insect's life cycle starts as a pupa but the cricket develops into an adult from the egg stage.

Ⓑ The first stage of an insect's life cycle starts as a larva but the cricket develops into an adult from the pupa stage.

Ⓒ The first stage of an insect's life cycle starts as an egg but the cricket develops into an adult from the nymph stage.

Ⓓ The first stage of an insect's life cycle starts as a nymph but the cricket develops into an adult from the larva stage.

8 The students found evidence that the life cycles of the insects did not have the same stages.

Which life-cycle stages do both insects have in common?

Select all that apply.

Ⓐ Adult

Ⓑ Egg

Ⓒ Larva

Ⓓ Nymph

Ⓔ Pupa

9 What would <u>most likely</u> be the results if ladybugs stopped producing eggs?

Select all that apply.

● Ⓐ decreased numbers of larva

Ⓑ decreased numbers of adult ladybugs

Ⓒ decreased amount of ladybug habitat

Ⓓ loss of the entire ladybug population over time

Ⓔ loss of all food sources for the ladybug population over time

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SERIAL #

10 The purpose of the students' cricket investigation was to observe the crickets' response to a stimulus.

The students <u>most likely</u> used the cotton balls soaked in solutions as evidence that the crickets are attracted by certain

Ⓐ colors

Ⓑ odors

Ⓒ sounds

Ⓓ temperatures

11 The observation that <u>most likely</u> helped the students draw the conclusion about ladybugs is that the ladybugs

Ⓐ flew around all flowers equally

Ⓑ rested equally on all flower colors

Ⓒ ate parts of certain flowers most often

Ⓓ rested on a single flower color most often

12 At the completion of the ladybug investigation, the students performed further research and discovered that ladybugs eat aphids, which are white.

Describe how this information would <u>most likely</u> help the students understand the results of the ladybug investigation. In your description, be sure to include

- **evidence from the investigation**
- **the sensory organs the ladybug would use**

STOP

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SERIAL #

cc

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

Section 4

Directions:

Today you are going to 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.

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GO ON ▶

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SERIAL #

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[1] 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[2] 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.

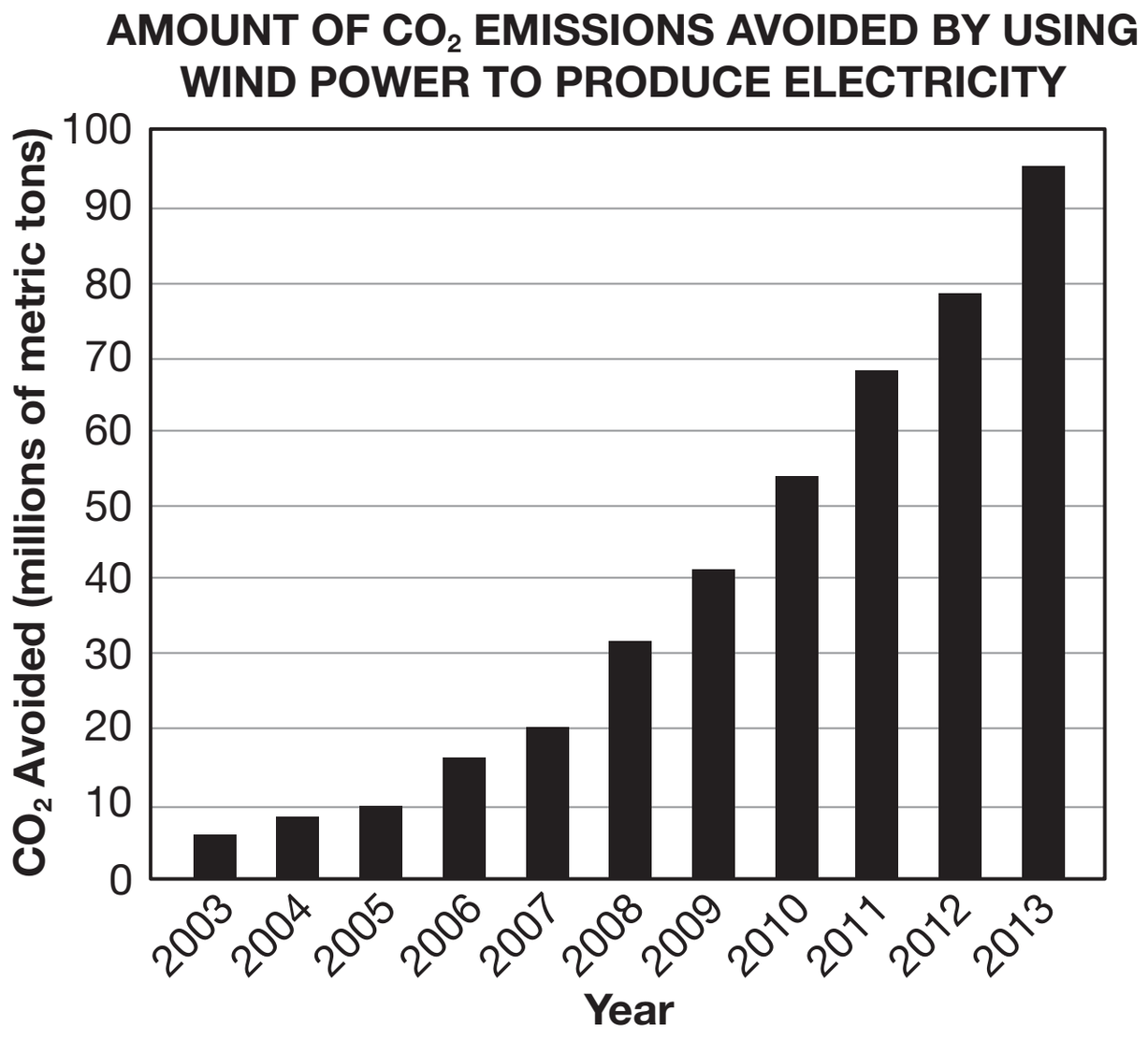
While solar cookers are not a new idea, this is the first time someone has come up with one that works and is cheap enough to be adapted on a large scale.

"Simple Cardboard Invention May Help Billions" - Meera Dolasia, DOGO News, © 2009. Reprinted by permission of the publisher.

[1]Dubbed — named

[2]manufacture — make

After reading about the solar-powered ovens, a student was curious about other technologies that help reduce carbon dioxide (CO_2) 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.

GO ON ▶

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 all that apply.

Ⓐ 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 <u>most likely</u> 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 <u>most likely</u>

Ⓐ 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

PLEASE DO NOT WRITE IN THIS AREA

SERIAL #

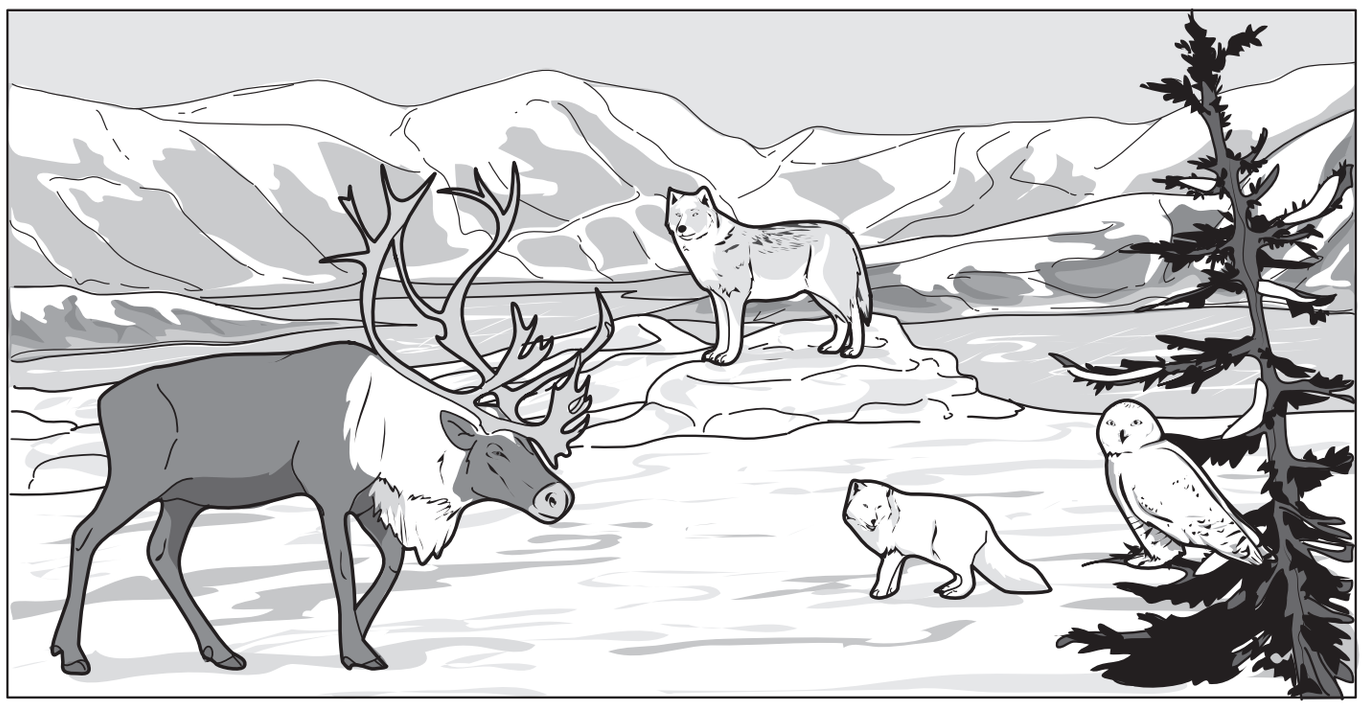
6 Use evidence to explain the effects that using John Bohmer's invention would have on the environment in developing countries compared to the current method of cooking food in those countries.

GO ON ▶

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.



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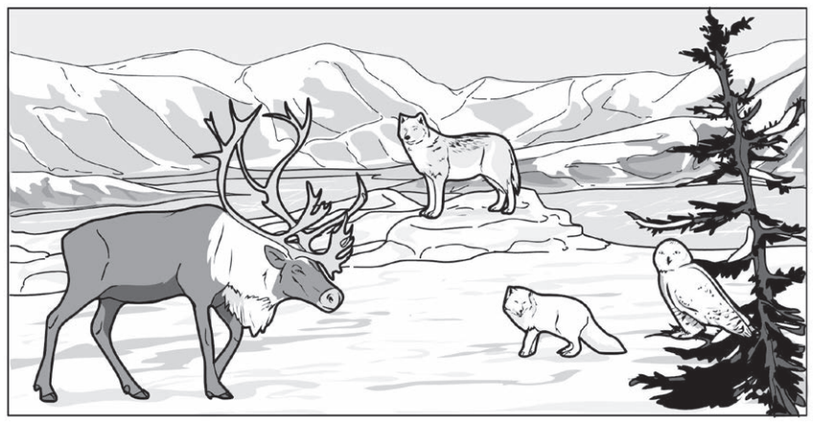
SERIAL #

Name	Observations
Caribou	• herbivores • migrate north in summer • migrate south in winter • large hooves • male and females have antlers • coats are white in winter • coats are brown in summer
Arctic Wolf	• carnivores • live alone or in packs of six • ears are smaller than the gray wolf's • legs are shorter than the gray wolf's • coats are thick and white
Arctic Fox	• omnivores • live in burrows • white coat in winter • brown or gray coat in summer
Snowy Owl	• carnivores • feathers turn whiter as they get older • hunt at night and day • excellent hearing and eyesight

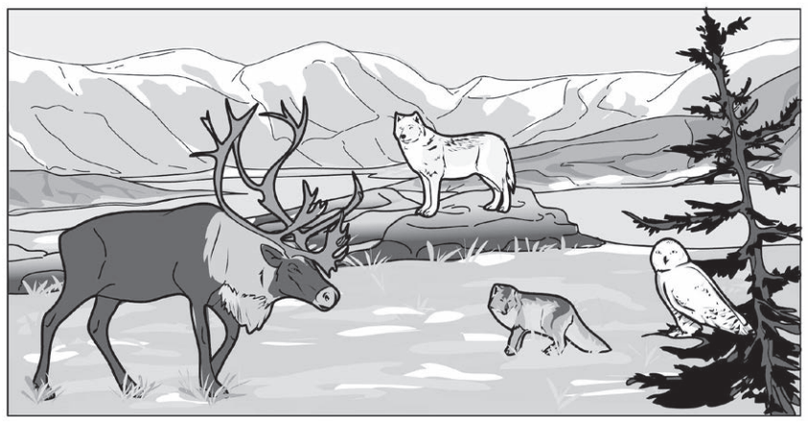
While researching tundra animals, the students found that the animals' environment changes. Higher temperatures have reduced the amount of snow present in the tundra, leading to more springlike and summerlike days. The students investigated how changes to the environment may affect the animals that live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

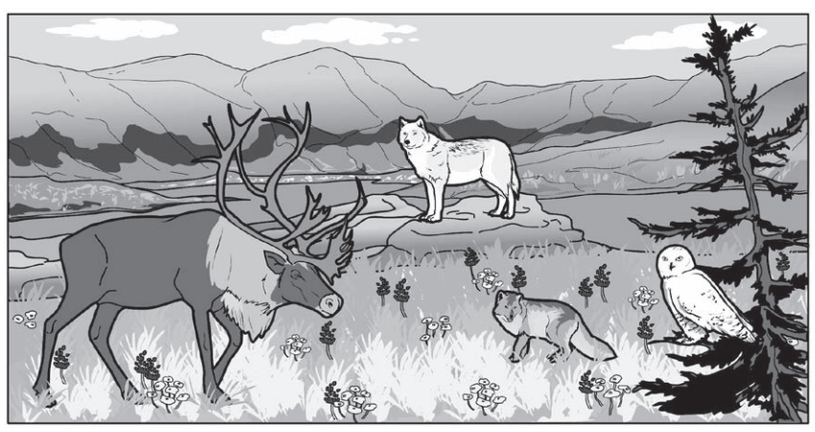
WINTER



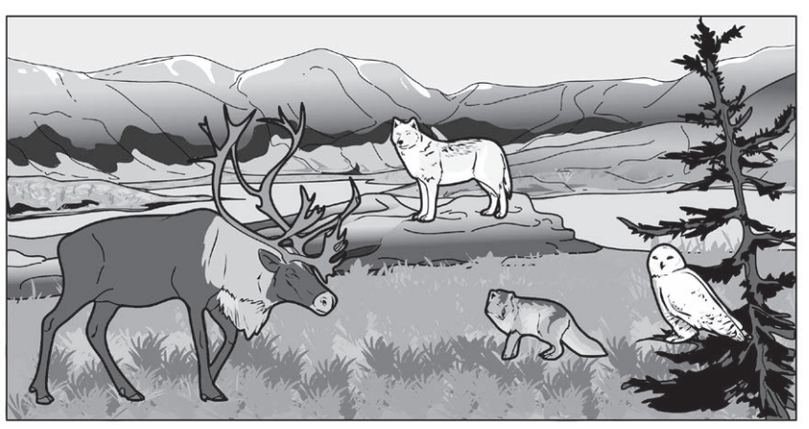
SPRING



SUMMER



FALL



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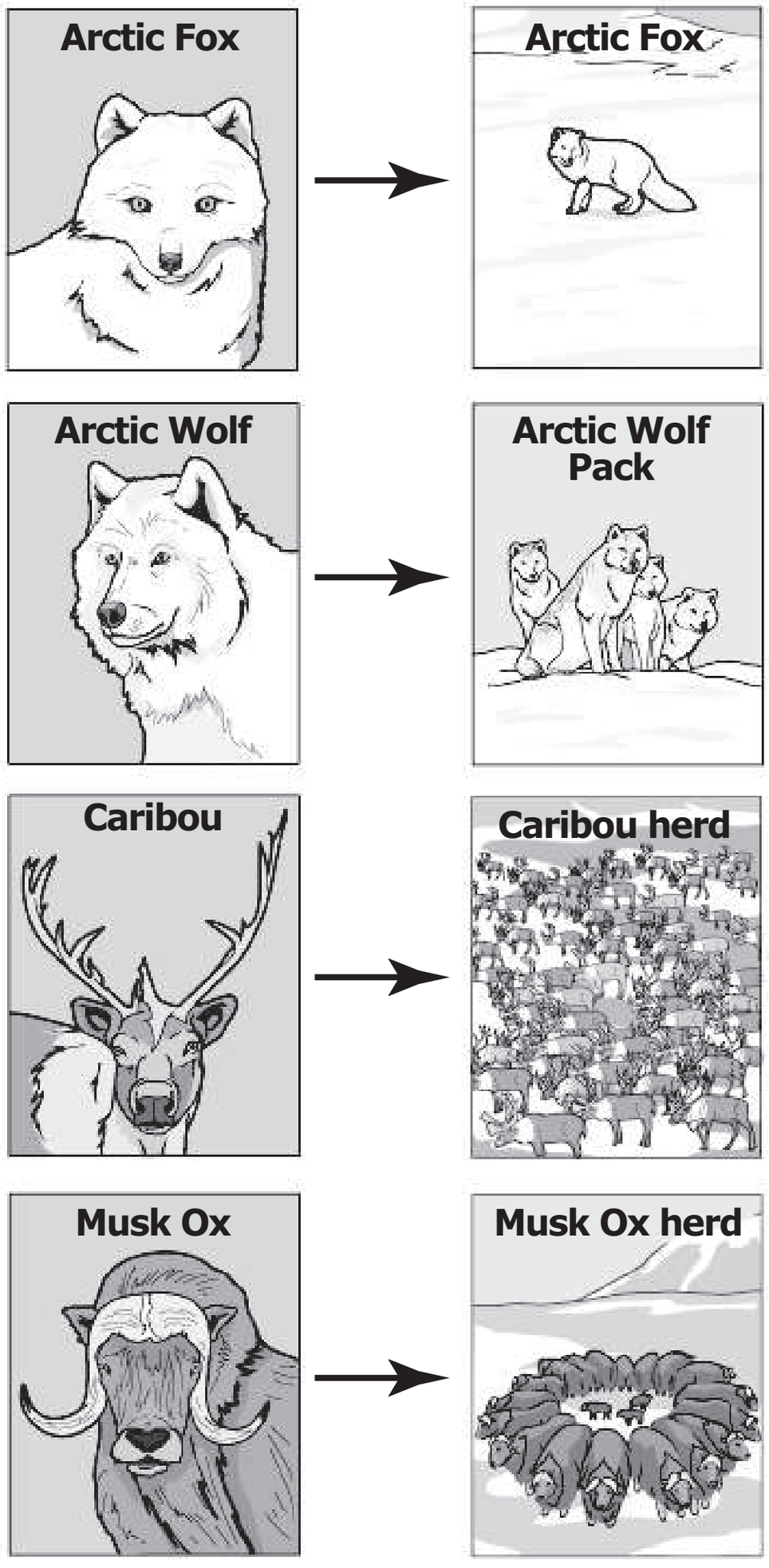
SERIAL #

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 all that apply.

Ⓐ 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 <u>best</u> 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

GO ON ▶

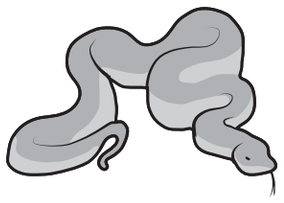
PLEASE DO NOT WRITE IN THIS AREA

SERIAL #

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

Select the animals that would <u>most likely</u> be able to survive in a tundra environment.

Ⓐ



Snake

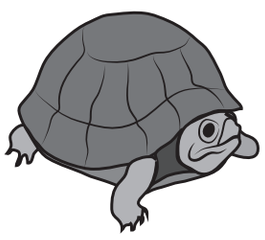
Ⓑ

Polar Bear

Ⓒ

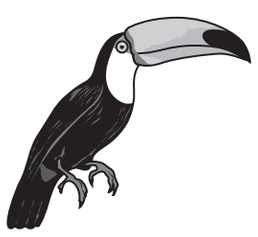
Oriole Bird

Ⓓ



Turtle

Ⓔ



Toucan Bird

Ⓕ

Husky Dog

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 <u>most likely</u> 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

GO ON ▶

PLEASE DO NOT WRITE IN THIS AREA

SERIAL #

12 Use evidence from the research to support the claim that being part of a group helps the animals survive.

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

STOP

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SERIAL #

P

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