

# Maryland MCAP Grade 5 Science Practice

Exam Materials  
Pages 2 - 61

Answer Key Materials  
Pages 62 - 65



Maryland Comprehensive  
Assessment Program

Grade 5  
MISA  
Practice Test



# 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.

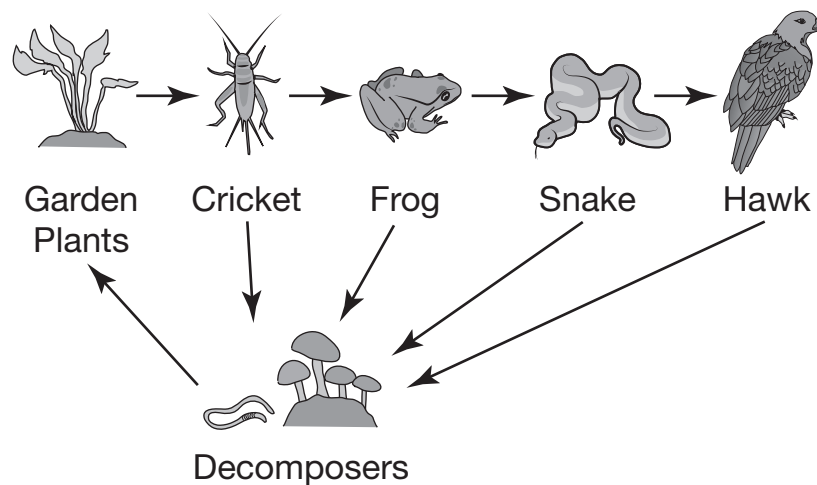
If you do not know the answer to a question, you may go on to the next question. If you finish early, you may review your answers and any questions you did not answer in this Section ONLY. Do not go past the stop sign.

**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.**

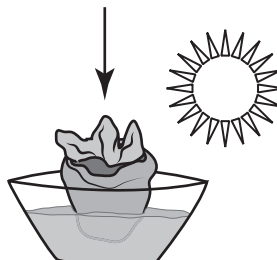
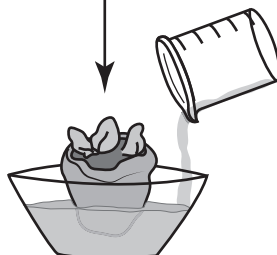
**Once a week, the students recorded their observations about the garden in their journals. When the plants were fully grown, the students took the plants out of the soil, rinsed them off with water, and had a garden day. During garden day, other students from the school were invited to view the fully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



**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**

- (A) eaten by the crickets
- (B) used as shelter by the snakes
- (C) used as nutrients for the hawk
- (D) 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**

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

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

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

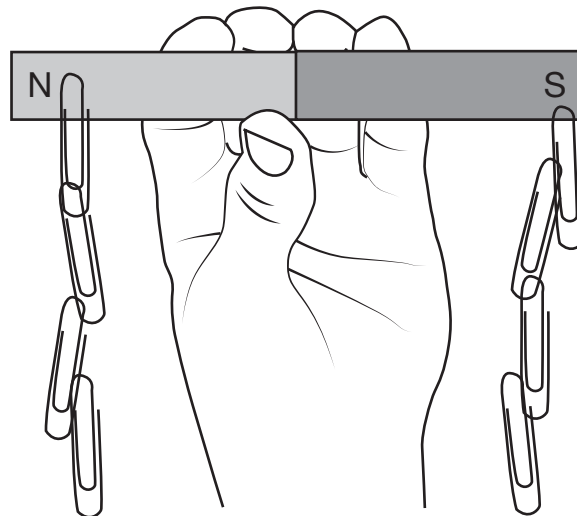
- Which statement provides evidence that supports this claim?**

- GO ON ►**





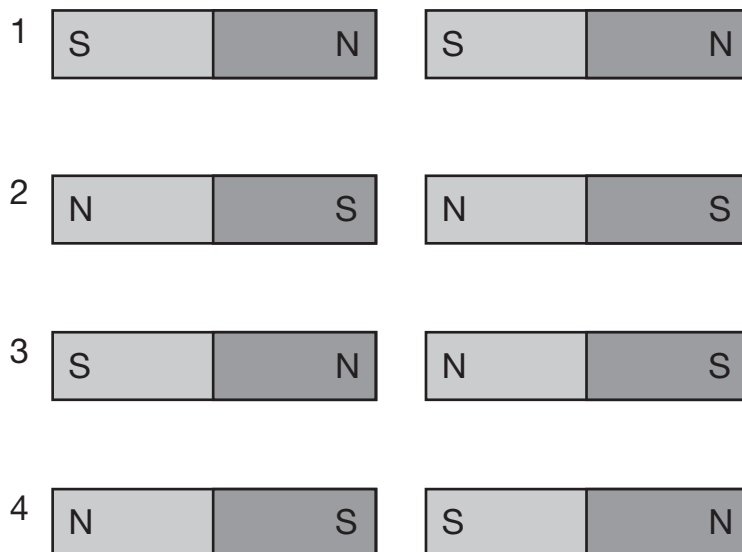
**During an investigation in a science class, a teacher held a bar magnet above a pile of steel paper clips on a lab table and then moved the magnet toward the pile. When the magnet was approximately 5 centimeters above the pile, a few paper clips moved off the table toward the bar magnet. The teacher 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.**



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



**7 Which question did the students most likely 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 best 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

A diagram of a hand holding a horizontal bar. The bar has four numbered points: 1 at the top center with an upward arrow, 2 at the right end with a rightward arrow, 3 at the bottom center with a downward arrow, and 4 at the left end with a leftward arrow. Paper clips are attached to the ends of the bar.

- 10 During the “Magnet Investigation,” the students asked if the bar magnets attracted or repelled each other.**

☐ Trial 1 and Trial 2  
☐ Trial 2 and Trial 3  
☐ Trial 2 and Trial 4  
☐ Trial 3 and Trial 4

- Ⓐ the size of the magnets
- Ⓑ the shape of the magnets
- Ⓒ the strength of like and unlike poles
- Ⓓ the placement of like and unlike poles

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.



# 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.

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.

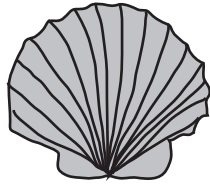
**A science club was planning a field trip to Calvert Cliffs State Park in Maryland. The purpose of the field trip was to observe rock layers and to record information about the different layers of rock. Before the trip, the students researched rock layers and drew diagrams of different rock layers in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

A geological cross-section diagram illustrating a fault and an unconformity. The diagram is divided into several layers and features:

- Layer 1:** The bottom-most layer, representing water, indicated by wavy lines.
- Layer 2:** A layer of sedimentary rock, represented by horizontal blocks, situated above the water.
- Layer 3:** A layer of sedimentary rock, represented by horizontal blocks, situated above Layer 2.
- Layer 4:** A layer of sedimentary rock, represented by horizontal blocks, situated above Layer 3.
- Layer 5:** A layer of sedimentary rock, represented by horizontal blocks, situated above Layer 4.
- Layer 6:** The top-most layer, representing soil or vegetation, indicated by small tree-like shapes.
- Fault:** A diagonal line representing a fault, separating the left side of the diagram from the right side. The fault line is labeled with a '5' and an arrow pointing to it.
- Unconformity:** A diagonal line representing an unconformity, separating the left side of the diagram from the right side. The unconformity line is labeled with a '6' and an arrow pointing to it.
- Other Labels:** The numbers 1, 2, 3, and 4 are also used to label specific layers or features within the diagram.

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.

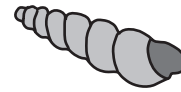
### FOSSILS OBSERVED AT CALVERT CLIFFS



Scallop Shell  
Fossil



Murex Shell  
Fossil



Snail Fossil



Shark Tooth  
Fossil

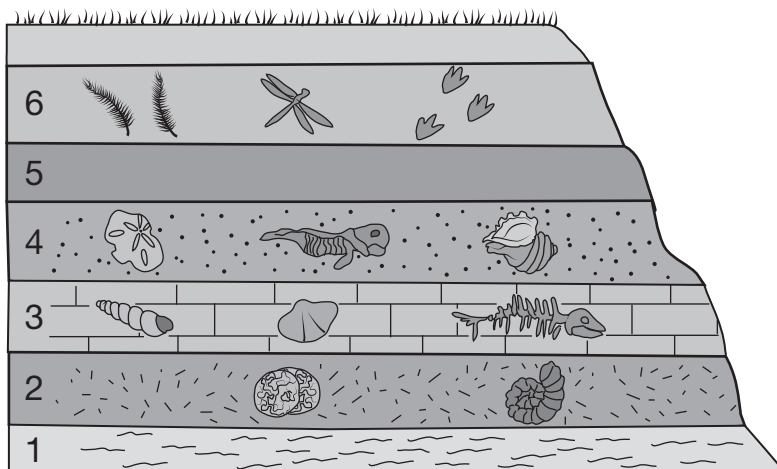


Sand Dollar  
Fossil

### ROCK LAYERS OF CALVERT CLIFFS



## ROCK LAYERS CONTAINING FOSSILS



not drawn to scale

- 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 most likely 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



- 

**5 What evidence can be obtained from the rock layers diagram about the organisms in layer 3?**

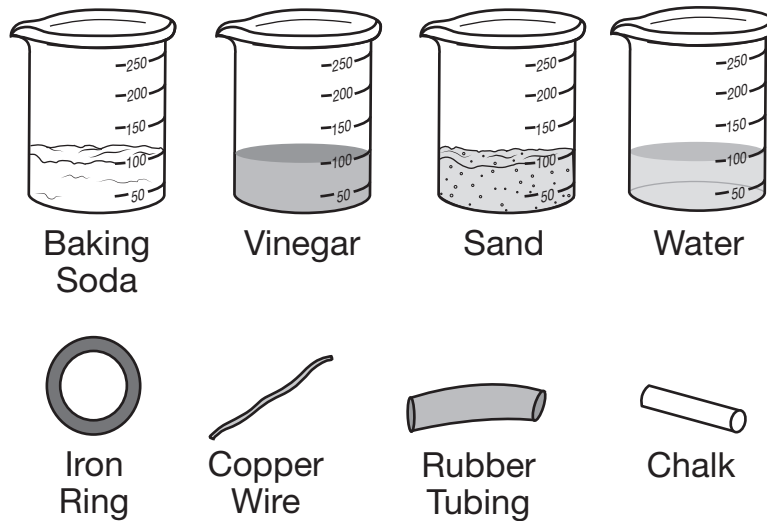
- Ⓐ The organisms in layer 3 lived before organisms in layer 2 and after organisms in layer 6.
- Ⓑ The organisms in layer 3 lived after organisms in layer 2 and before organisms in layer 6.
- Ⓒ The organisms in layer 3 lived after organisms in layer 4 and at the same time as organisms in layer 6.
- Ⓓ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

[illegible]



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

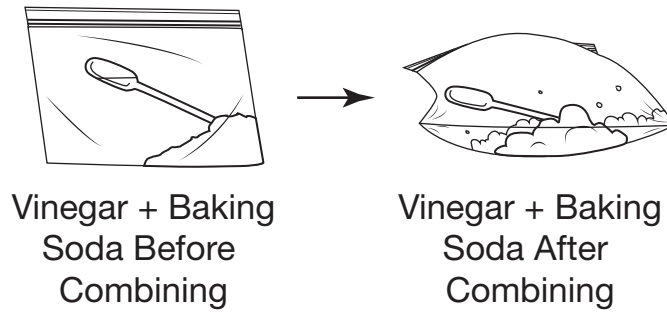
A science class investigated the properties of matter and observed that some forms of matter, gases, such as air, are not easily observed. Other forms of matter, such as liquids and solids, are easily observed and can be sorted using physical properties. In order to investigate the physical properties 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.



## Combining vinegar and baking soda.

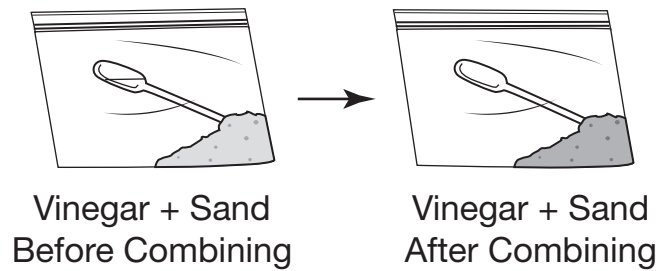
1. **Place a plastic pipette filled with vinegar inside a plastic bag containing baking soda.**
2. **Seal the plastic bag.**
3. **Measure the mass of the bag using a balance.**
4. **Place the bag on a lab table.**
5. **Squeeze the pipette to combine the vinegar with the baking soda.**
6. **Measure the 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.



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

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

**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 most likely use to sort the liquids?

Select all that apply.

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

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

- 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

- 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.**

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

[illegible]



### Section 3



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.

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>

39

PLEASE DO NOT WRITE IN THIS AREA

**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





**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 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

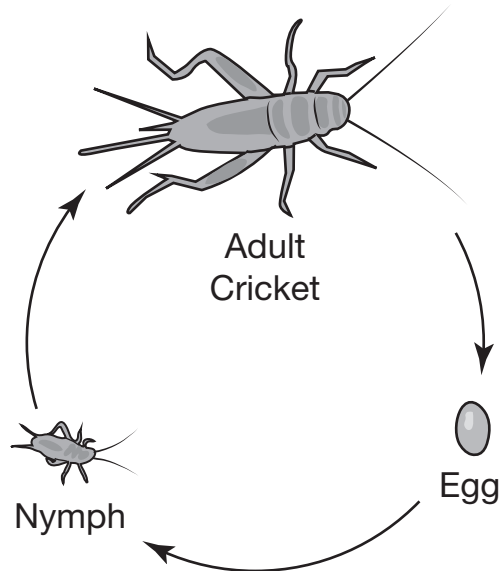
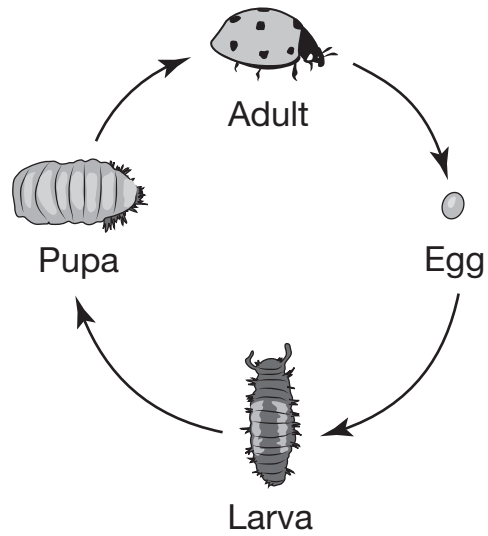


[illegible]

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.



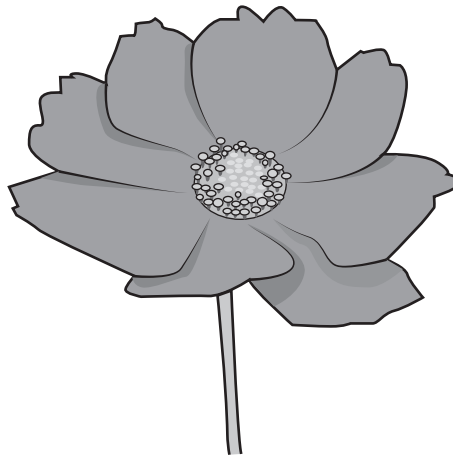


To learn more about how insects interact with their environment the students performed an investigation with each insect, the details of which are shown.

**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**



**The results are shown.**

**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.



1. **Introduction**  
 2. **Background**  
 3. **Methodology**  
 4. **Results**  
 5. **Discussion**  
 6. **Conclusion**  
 7. **References**  
 8. **Appendix**  
 9. **Figure 1**  
 10. **Figure 2**  
 11. **Figure 3**  
 12. **Figure 4**  
 13. **Figure 5**  
 14. **Figure 6**  
 15. **Figure 7**  
 16. **Figure 8**  
 17. **Figure 9**  
 18. **Figure 10**  
 19. **Figure 11**  
 20. **Figure 12**  
 21. **Figure 13**  
 22. **Figure 14**  
 23. **Figure 15**  
 24. **Figure 16**  
 25. **Figure 17**  
 26. **Figure 18**  
 27. **Figure 19**  
 28. **Figure 20**  
 29. **Figure 21**  
 30. **Figure 22**  
 31. **Figure 23**  
 32. **Figure 24**  
 33. **Figure 25**  
 34. **Figure 26**  
 35. **Figure 27**  
 36. **Figure 28**  
 37. **Figure 29**  
 38. **Figure 30**  
 39. **Figure 31**  
 40. **Figure 32**  
 41. **Figure 33**  
 42. **Figure 34**  
 43. **Figure 35**  
 44. **Figure 36**  
 45. **Figure 37**  
 46. **Figure 38**  
 47. **Figure 39**  
 48. **Figure 40**  
 49. **Figure 41**  
 50. **Figure 42**  
 51. **Figure 43**  
 52. **Figure 44**  
 53. **Figure 45**  
 54. **Figure 46**  
 55. **Figure 47**  
 56. **Figure 48**  
 57. **Figure 49**  
 58. **Figure 50**  
 59. **Figure 51**  
 60. **Figure 52**  
 61. **Figure 53**  
 62. **Figure 54**  
 63. **Figure 55**  
 64. **Figure 56**  
 65. **Figure 57**  
 66. **Figure 58**  
 67. **Figure 59**  
 68. **Figure 60**  
 69. **Figure 61**  
 70. **Figure 62**  
 71. **Figure 63**  
 72. **Figure 64**  
 73. **Figure 65**  
 74. **Figure 66**  
 75. **Figure 67**  
 76. **Figure 68**  
 77. **Figure 69**  
 78. **Figure 70**  
 79. **Figure 71**  
 80. **Figure 72**  
 81. **Figure 73**  
 82. **Figure 74**  
 83. **Figure 75**  
 84. **Figure 76**  
 85. **Figure 77**  
 86. **Figure 78**  
 87. **Figure 79**  
 88. **Figure 80**  
 89. **Figure 81**  
 90. **Figure 82**  
 91. **Figure 83**  
 92. **Figure 84**  
 93. **Figure 85**  
 94. **Figure 86**  
 95. **Figure 87**  
 96. **Figure 88**  
 97. **Figure 89**  
 98. **Figure 90**  
 99. **Figure 91**  
 100. **Figure 92**  
 101. **Figure 93**  
 102. **Figure 94**  
 103. **Figure 95**  
 104. **Figure 96**  
 105. **Figure 97**  
 106. **Figure 98**  
 107. **Figure 99**  
 108. **Figure 100**  
 109. **Figure 101**  
 110. **Figure 102**  
 111. **Figure 103**  
 112. **Figure 104**  
 113. **Figure 105**  
 114. **Figure 106**  
 115. **Figure 107**  
 116. **Figure 108**  
 117. **Figure 109**  
 118. **Figure 110**  
 119. **Figure 111**  
 120. **Figure 112**  
 121. **Figure 113**  
 122. **Figure 114**  
 123. **Figure 115**  
 124. **Figure 116**  
 125. **Figure 117**  
 126. **Figure 118**  
 127. **Figure 119**  
 128. **Figure 120**  
 129. **Figure 121**  
 130. **Figure 122**  
 131. **Figure 123**  
 132. **Figure 124**  
 133. **Figure 125**  
 134. **Figure 126**  
 135. **Figure 127**  
 136. **Figure 128**  
 137. **Figure 129**  
 138. **Figure 130**  
 139. **Figure 131**  
 140. **Figure 132**  
 141. **Figure 133**  
 142. **Figure 134**  
 143. **Figure 135**  
 144. **Figure 136**  
 145. **Figure 137**  
 146. **Figure 138**  
 147. **Figure 139**  
 148. **Figure 140**  
 149. **Figure 141**  
 150. **Figure 142**  
 151. **Figure 143**  
 152. **Figure 144**  
 153. **Figure 145**  
 154. **Figure 146**  
 155. **Figure 147**  
 156. **Figure 148**  
 157. **Figure 149**  
 158. **Figure 150**  
 159. **Figure 151**  
 160. **Figure 152**  
 161. **Figure 153**  
 162. **Figure 154**  
 163. **Figure 155**  
 164. **Figure 156**  
 165. **Figure 157**  
 166. **Figure 158**  
 167. **Figure 159**  
 168. **Figure 160**  
 169. **Figure 161**  
 170. **Figure 162**  
 171. **Figure 163**  
 172. **Figure 164**  
 173. **Figure 165**  
 174. **Figure 166**  
 175. **Figure 167**  
 176. **Figure 168**  
 177. **Figure 169**  
 178. **Figure 170**  
 179. **Figure 171**  
 180. **Figure 172**  
 181. **Figure 173**  
 182. **Figure 174**  
 183. **Figure 175**  
 184. **Figure 176**  
 185. **Figure 177**  
 186. **Figure 178**  
 187. **Figure 179**  
 188. **Figure 180**  
 189. **Figure 181**  
 190. **Figure 182**  
 191. **Figure 183**  
 192. **Figure 184**  
 193. **Figure 185**  
 194. **Figure 186**  
 195. **Figure 187**  
 196. **Figure 188**  
 197. **Figure 189**  
 198. **Figure 190**  
 199. **Figure 191**  
 200. **Figure 192**  
 201. **Figure 193**  
 202. **Figure 194**  
 203. **Figure 195**  
 204. **Figure 196**  
 205. **Figure 197**  
 206. **Figure 198**  
 207. **Figure 199**  
 208. **Figure 200**  
 209. **Figure 201**  
 210. **Figure 202**  
 211. **Figure 203**  
 212. **Figure 204**  
 213. **Figure 205**  
 214. **Figure 206**  
 215. **Figure 207**  
 216. **Figure 208**  
 217. **Figure 209**

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

**The students most likely used the cotton balls soaked in solutions as evidence that the crickets are attracted by certain**

- Ⓐ colors
- Ⓑ odors
- Ⓒ sounds
- Ⓓ temperatures

- 11 The observation that most likely 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

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

[illegible]

## 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.

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.

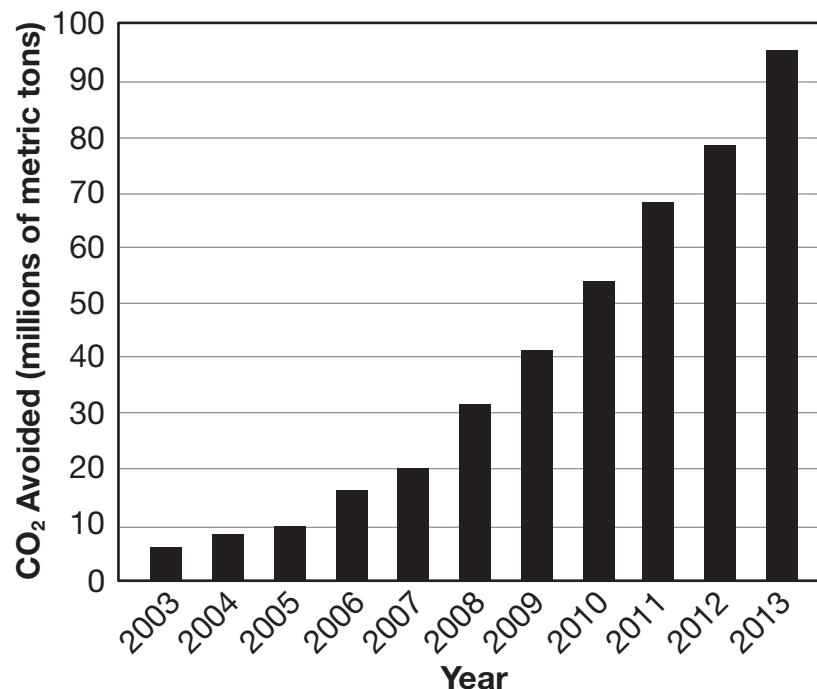
“Simple Cardboard Invention May Help Billions” - Meera Dolasia, DOGO News, © 2009. Reprinted by permission of the publisher.

<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.

## AMOUNT OF CO<sub>2</sub> EMISSIONS AVOIDED BY USING WIND POWER TO PRODUCE ELECTRICITY



**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 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

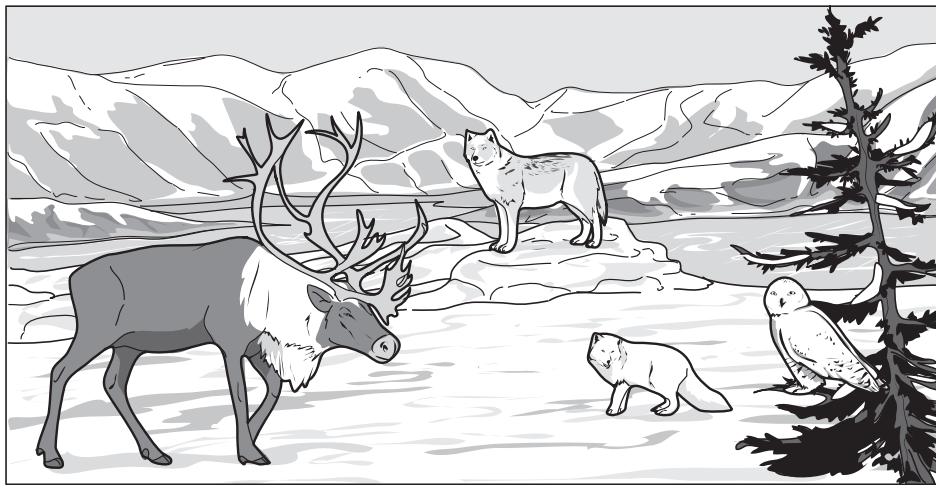
**3 The increased use of the invention would most likely increase**

- Ⓐ 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



[illegible]

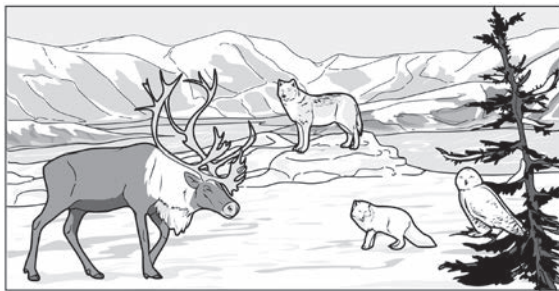
**The students chose four animals that are found in a tundra environment and researched information about each, shown in the table.**



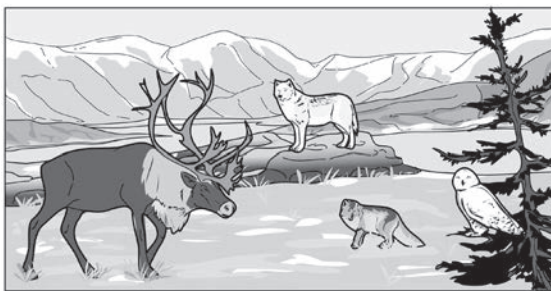
Name	Observations
Caribou	<ul style="list-style-type: none"><li>• herbivores</li><li>• migrate north in summer</li><li>• migrate south in winter</li><li>• large hooves</li><li>• male and females have antlers</li><li>• coats are white in winter</li><li>• coats are brown in summer</li></ul>
Arctic Wolf	<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>

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

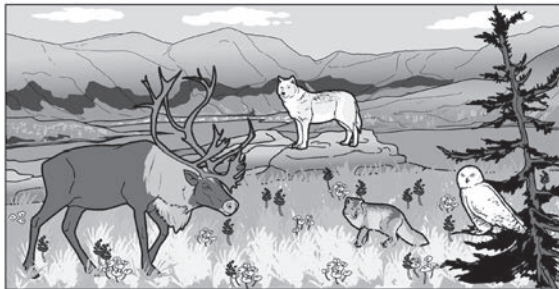
## WINTER



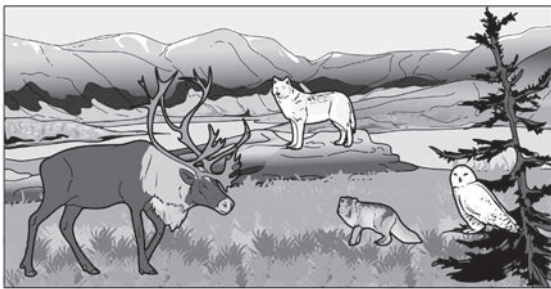
## SPRING



## SUMMER



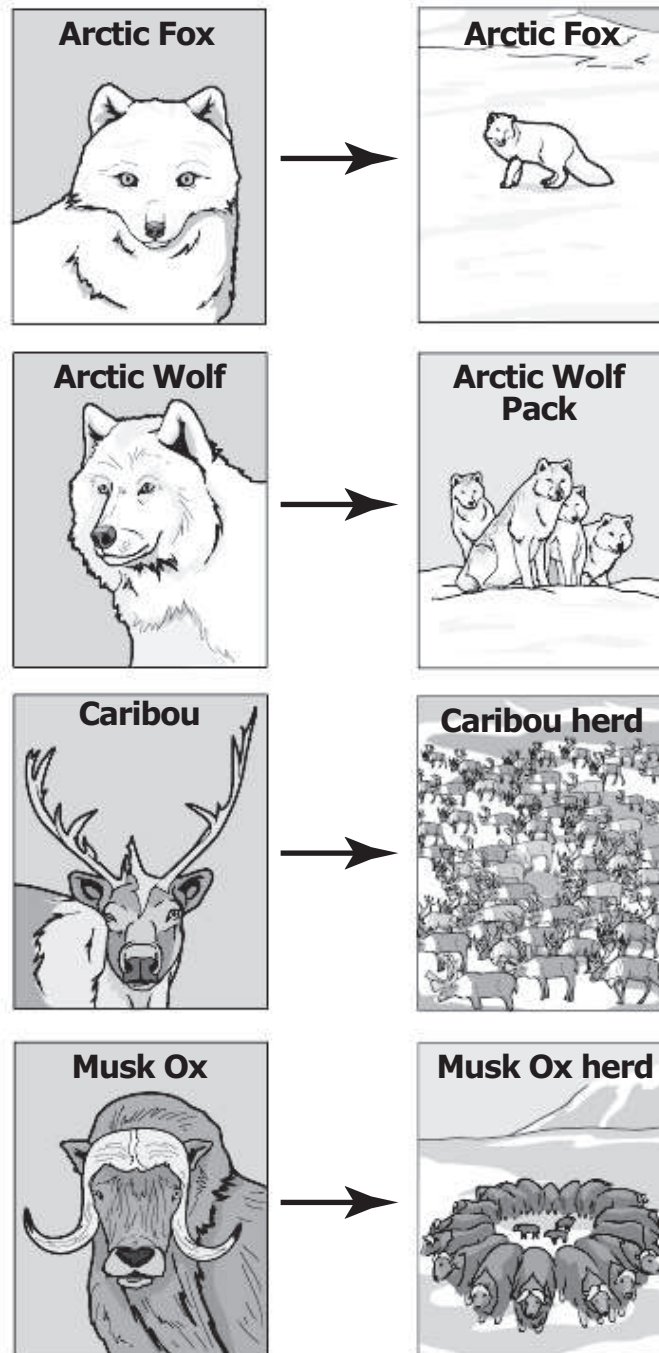
## FALL





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.



## Section 4

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

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

(A)



Snake

(B)



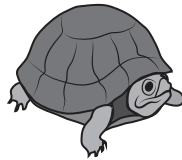
Polar Bear

(C)



Oriole Bird

(D)



Turtle

(E)



Toucan Bird

(F)



Husky Dog

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

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

[illegible]

## Practice Test Answer and Alignment Document

### Science: Grade 5

#### Section 1

Item Number	Answer Key	Performance Expectation
1. 51636_10	D	5-LS2-1
2. 51636_06	D	5-LS2-1
3. 51636_09	D, E	5-LS2-1
4. 51636_01	D	5-LS1-1
5. 51636_02	B	5-LS1-1
6. 51636_12	Refer to Grade 5 Science Scoring Rubric	5-LS2-1
7. 51614_09	B	3-PS2-3
8. 51614_02	C	3-PS2-3
9. 51614_11_P	C	5-PS2-1
10. 51614_04_P	D	3-PS2-3
11. 51614_10	D	3-PS2-3
12. 51614_06	Refer to Grade 5 Science Scoring Rubric	3-PS2-3

## Section 2

Item Number	Answer Key	Performance Expectation
1. 51615_02	C	4-ESS1-1
2. 51615_04	A	4-ESS1-1
3. 51615_05_P	D	3-LS4-1
4. 51615_09	B	3-LS4-1
5. 51615_03_P	B	4-ESS1-1
6. 51615_06	Refer to Grade 5 Science Scoring Rubric	3-LS4-1
7. 51613_01	A, B, C	5-PS1-4
8, 51613_02	<b>Part A:</b> B <b>Part B:</b> A, B	5-PS1-3
9. 51613_04_P	C	5-PS1-3
10. 51613_05	A, E	5-PS1-4
11. 51613_07_P	A, C, E	5-PS1-4
12. 51613_06	Refer to Grade 5 Science Scoring Rubric	5-PS1-4

### Section 3

Item Number	Answer Key	Performance Expectation
1. 51632_01	B	4-ESS3-1
2. 51632_09	A, C, E	4-ESS3-1
3. 51632_02	C	4-ESS3-1
4. 51632_06_P	A	5-ESS3-1
5. 51632_05	<b>Part A:</b> B, C, E <b>Part B:</b> A	4-ESS3-1
6. 51632_11	Refer to Grade 5 Science Scoring Rubric	5-ESS3-1
7. 51605_04_P	C	3-LS1-1
8. 51605_03_P	A, B	3-LS1-1
9. 51605_05	A, B, D	3-LS1-1
10. 51605_07	B	4-LS1-2
11. 51605_09	D	4-LS1-2
12. 51605_12	Refer to Grade 5 Science Scoring Rubric	4-LS1-2



## Section 4

Item Number	Answer Key	Performance Expectation
1. 51750_02	B	4-ESS3-1
2. 51750_03	B, C, F	4-ESS3-1
3. 51750_05	D	4-ESS3-1
4. 51750_07_P	D	5-ESS3-1
5. 51750_09	B	5-ESS3-1
6. 51750_06	Refer to Grade 5 Science Scoring Rubric	4-ESS3-1
7. 51697_08	B, D, E	3-LS4-3
8. 51697_03	C	3-LS4-3
9. 51697_04_P	B, F	3-LS4-3
10. 51697_07	D	3-LS2-1
11. 51697_11	D	3-LS2-1
12. 51697_12	Refer to Grade 5 Science Scoring Rubric	3-LS2-1