

## 2021 Innovative Science Sample Student Work and Scoring Guide

### Grade 8

#### Question 8: Constructed-Response

#### Reporting Category: Life Science

**Practice Category: Evidence, Reasoning, and Modeling:** Evaluate claims and evidence to argue the best scientific explanation or engineering design solution, including developing and analyzing models to represent scientific phenomena and engineering concepts.

**Standard: 8.LS.4.4** Use a model to describe the process of natural selection, in which genetic variations of some traits in a population increase some individuals' likelihood of surviving and reproducing in a changing environment. Provide evidence that natural selection occurs over many generations.

**Item Description:** Determine factors that impact a genetic change in a population over time.

#### Scoring Guide

*Select a score point in the table to view the sample student response.*

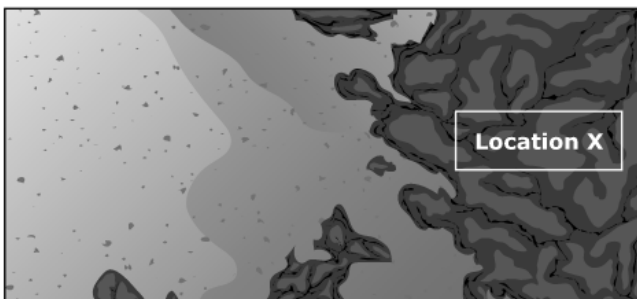
Score	Description
<u>3</u>	The response demonstrates a thorough understanding of the task by: <ul style="list-style-type: none"><li>Identifying that the number of gray mice at Location X increased after the volcanic eruption.</li><li>Explaining how having gray or tan fur became an advantage/disadvantage due to the dark rocks created by the volcanic eruption.</li><li>Explaining that the gray/tan mice were more/less likely to reproduce and pass their traits on to their offspring.</li></ul>
<u>2</u>	The response demonstrates a general understanding of the task by correctly responding to two of the three bullets.
<u>1</u>	The response demonstrates a minimal understanding of the task by correctly responding to one of the three bullets.
<u>0</u>	The response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

## Score Point 3

Lava Flow

Simulation

Volcanic eruptions around 1,000 years ago resulted in the formation of dark rocks in the desert. The images show what scientists think the desert looked like 1,200 years ago and what it looks like today.

**Overhead View of Desert 1,200 Years Ago****Overhead View of Desert Today****This question has two parts.**

Compare the image of the desert before the volcanic eruptions at Location X with the image of the desert today. Scientists think that gray mice and tan mice existed before the volcanic eruptions.

**Part A**

Determine whether there would have been more gray mice or more tan mice at Location X 1,200 years ago. Then determine whether there would be more gray mice or more tan mice at Location X today.

There would have been more tan mice at Location X 1,200 years ago. This is because it was entirely sand, which means that tan mice would blend in much better than grey mice. Today, there is more grey mice. This is because it is entirely black rock, which means that grey mice would have better camouflage.

**Part B**

Explain how the process of natural selection **most likely** affected the fur color of the mice at Location X during the generations that followed the volcanic eruption.

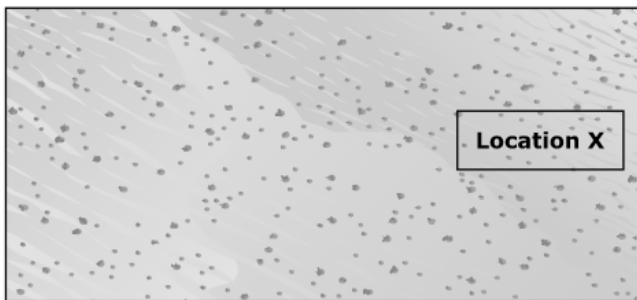
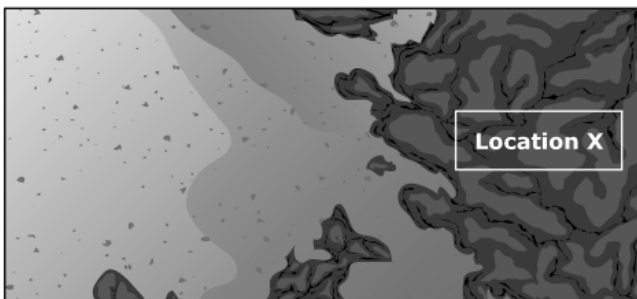
The tan mice would have stood out more, which means it would have been easier for predators like owls or hawks to spot them. This would mean that tan mice would die at a higher rate compared to grey mice, and that in turn means tan mice wouldn't survive to reproduce.

## Score Point 2

Lava Flow

Simulation

Volcanic eruptions around 1,000 years ago resulted in the formation of dark rocks in the desert. The images show what scientists think the desert looked like 1,200 years ago and what it looks like today.

**Overhead View of Desert 1,200 Years Ago****Overhead View of Desert Today**

This question has two parts.

Compare the image of the desert before the volcanic eruptions at Location X with the image of the desert today. Scientists think that gray mice and tan mice existed before the volcanic eruptions.

**Part A**

Determine whether there would have been more gray mice or more tan mice at Location X 1,200 years ago. Then determine whether there would be more gray mice or more tan mice at Location X today.

There would be more tan mice 1,200 years ago because the surrounding color is tan. There would be more gray mice now because the surrounding location is dark.

**Part B**

Explain how the process of natural selection **most likely** affected the fur color of the mice at Location X during the generations that followed the volcanic eruption.

The tan mice most likely got killed more often because they stand out.

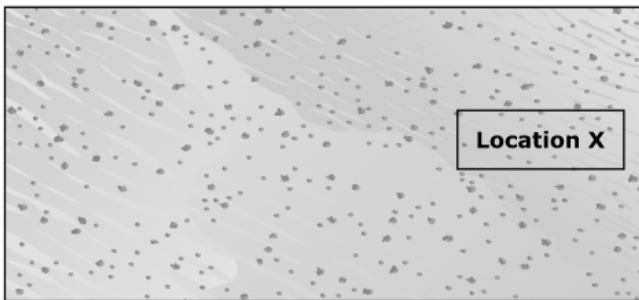
Score Point 1

Lava Flow

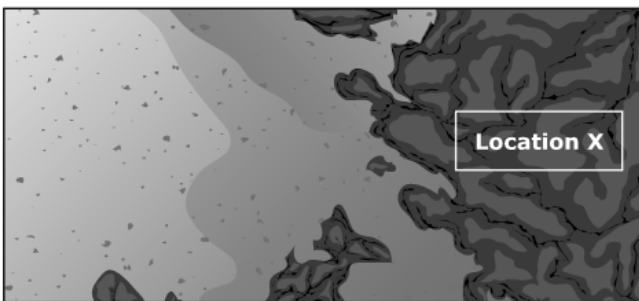
Simulation

Volcanic eruptions around 1,000 years ago resulted in the formation of dark rocks in the desert. The images show what scientists think the desert looked like 1,200 years ago and what it looks like today.

**Overhead View of Desert 1,200 Years Ago**



**Overhead View of Desert Today**



**This question has two parts.**

Compare the image of the desert before the volcanic eruptions at Location X with the image of the desert today. Scientists think that gray mice and tan mice existed before the volcanic eruptions.

**Part A**

Determine whether there would have been more gray mice or more tan mice at Location X 1,200 years ago. Then determine whether there would be more gray mice or more tan mice at Location X today.

In location 1,200 they would be more tan mouse. In today location theres more gray mice.

**Part B**

Explain how the process of natural selection **most likely** affected the fur color of the mice at Location X during the generations that followed the volcanic eruption.

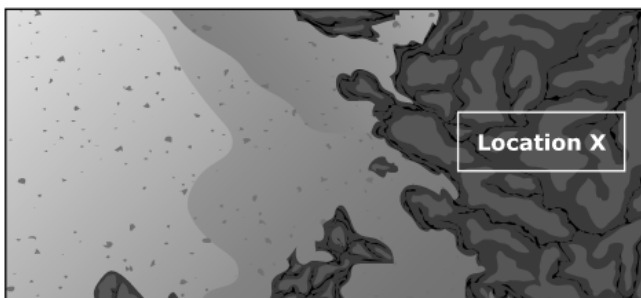
The volcan caused more gray mouse because we gained more after the volvanos.

## Score Point 0

Lava Flow

Simulation

Volcanic eruptions around 1,000 years ago resulted in the formation of dark rocks in the desert. The images show what scientists think the desert looked like 1,200 years ago and what it looks like today.

**Overhead View of Desert 1,200 Years Ago****Overhead View of Desert Today**

**This question has two parts.**

Compare the image of the desert before the volcanic eruptions at Location X with the image of the desert today. Scientists think that gray mice and tan mice existed before the volcanic eruptions.

**Part A**

Determine whether there would have been more gray mice or more tan mice at Location X 1,200 years ago. Then determine whether there would be more gray mice or more tan mice at Location X today.

there would be more grey mice in te desert  
1,200 years ago

**Part B**

Explain how the process of natural selection **most likely** affected the fur color of the mice at Location X during the generations that followed the volcanic eruption.

there would be more tan mice in the desert  
today