

Name: _____

Date: _____ Period: _____

The Pocket Mouse: Evolution on our time scale

Selective Force: an environmental pressure on a population of organisms that selects favorable traits in a population.

Part 1: Pictures

1. View the images of the pocket mouse populations in each location and record the numbers for each color.

Card 1

Location A: Light-colored fur _____ Dark-colored fur _____

Location B: Light-colored fur _____ Dark-colored fur _____

Card 2

Location A: Light-colored fur _____ Dark-colored fur _____

Location B: Light-colored fur _____ Dark-colored fur _____

Card 3

Location A: Light-colored fur _____ Dark-colored fur _____

Location B: Light-colored fur _____ Dark-colored fur _____

Card 4

Location A: Light-colored fur _____ Dark-colored fur _____

Location B: Light-colored fur _____ Dark-colored fur _____

2. What do you think happened at location B?
3. Arrange the cards in what you think is the correct order from the oldest to the most recent and write the order you chose: _____
4. Why did you choose the order that you did?
5. What do you think caused the pocket mouse population to change like it did?

Part 2: Video

Fill in the table with the correct information

Creature	Habitat Information	Adaptation	Advantage	Selective Force
Pocket Mouse				

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Answer the questions after watching the video.

1. What caused the unusual landscape at the Valley of Fire?
 - a. Flooding
 - b. Volcanic eruptions
 - c. Human activities
 - d. Forest fires
2. Predators of the pocket mice hunt using which sense?
 - a. Smell
 - b. Sound
 - c. Vision
 - d. Heat
3. Why did dark-colored pocket mice first appear in a population of light-colored pocket mice?
 - a. Individuals change color to blend in with the environment
 - b. There is dark lava rock in the area where they live.
 - c. They have a genetic mutation that affects their fur color.
 - d. Predators eat light-colored pocket mice.
4. Why do dark-colored pocket mice on dark lava flows have white bellies?
 - a. There is no selection for dark bellies by visual predators.
 - b. White bellies protect them from insects found in the desert
 - c. There is a reproductive advantage to having a light belly.
 - d. White bellies are an important part of camouflage.
5. Mutations are always
 - a. good
 - b. bad
 - c. neutral
 - d. a change in an organism's DNA
6. Dark pocket mice are found in locations far apart that have dark rock. What did DNA testing show about mice in different locations?
 - a. They had different mutations
 - b. They had the same mutations
 - c. They were a totally different species.
7. Now that you have watched the video, go back to your set of cards and arrange them in the order you think they happened, starting with the oldest. You may change your order from your original idea. Once you are satisfied with the order, complete the table.

		Sequence of Pictures			
		1st (Oldest))	2nd	3rd	4th (Newest)
Location A	# of dark mice				
	# of light mice				
Location B	# of dark mice				
	# of light mice				

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Part 3: Data Analysis + Graphing

- On a piece of graph paper, graph the changing population of mice at each location.
- Make two line graphs, one for location A and one for location B. Fit them on the same piece of graph paper if you can .
- Show both lines on the same graph.

Part 4: Analysis Questions

1. Describe the adaptation that was at work here.

2. Explain the selective force in the environment that determined the favorable trait.

3. Explain the evidence that the pocket mice have evolved.

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Highly Proficient Opportunity

Look at the table below and answer the questions on a separate piece of lined paper (or type):

1. What seems to determine which phenotype is more common?
2. Explain which population is an outlier from the general pattern.
3. What do you think might explain the color ratio in this outlier population?
4. Explain the dominance pattern that you think this follows. Include both alleles.
5. Using your knowledge of natural selection, explain the pattern of pocket mice color in these different areas.

Population →	Christmas Pass	Tule Well	Lava (West)	Lava (Mid)	Lava (East)	O'Neill Pass
Soil color	Light	Light	Dark	Dark	Dark	Light
Number of tan mice	6	80	0	0	3	34
Number of dark mice	0	5	7	5	42	43
Total number of mice	6	85	7	5	45	77
Percentage of tan mice	<u>100%</u>	<u>94%</u>	<u>0%</u>	<u>0%</u>	<u>7%</u>	<u>44%</u>

Natural Selection: Use evidence to support an explanation that natural selection can lead to increases and decreases of specific traits in populations of organisms over time.

Highly Proficient (4)	Proficient (3)	Close to Proficient (2)	Developing (1)
<input type="checkbox"/> The population data is connected to natural selection. <input checked="" type="checkbox"/> all answers have evidence and detail.	<input type="checkbox"/> student understands the basics of natural selection <input type="checkbox"/> Lab is complete <input type="checkbox"/> analysis questions are complete and most show thought. <input type="checkbox"/> Graph is complete and correct.	<input type="checkbox"/> Student has some knowledge of natural selection <input type="checkbox"/> Answers need more detail for higher level <input type="checkbox"/> Some information is incorrect <input type="checkbox"/> Work is incomplete <input type="checkbox"/> Graph is attempted.	<input type="checkbox"/> no understanding is shown <input type="checkbox"/> questions are mostly incomplete. <input type="checkbox"/> Graph is not attempted