Name: _____ Date: _____ Period: _____

Evolution by Natural Selection

Adapted from the University of California, Los Angeles Life Sciences 1 Demonstration Manual

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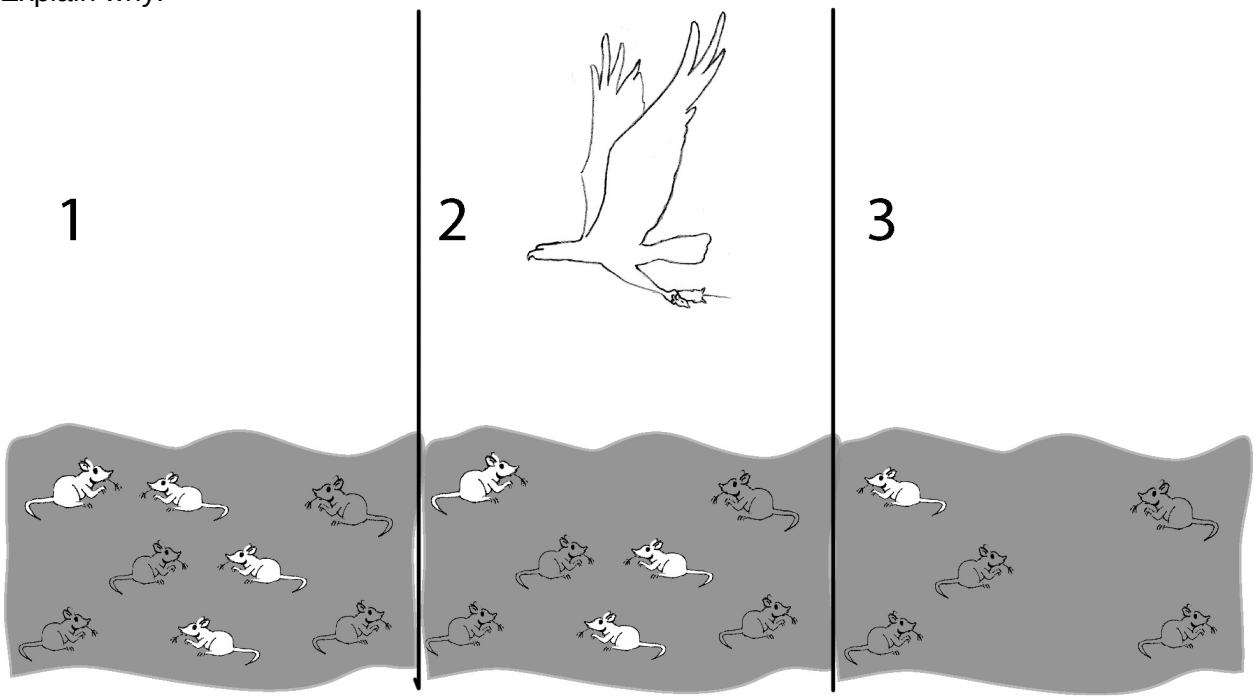
Describe what is happening in figures 1-3. Is the population of mice different in figure 3 than in figure 1? Explain why.



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Is the population of mice different in figure 3 than in figure 1? Explain why.

[1] Teachers are encouraged to copy this student handout for classroom use. A Word file (which can be used to prepare a modified version if desired), *Teacher Preparation Notes, comments, and the complete list of our hands-on activities are available at* http://serendip.brynmawr.edu/sci_edu/waldron/.

Living things that are well adapted to their environment survive and reproduce. Those that are not well adapted don't survive and reproduce. An **adaptation** is any characteristic that increases **fitness**, which is defined as the ability to survive and reproduce. What characteristic of the mice is an adaptation that increased their fitness?

The table below gives descriptions of four female mice that live in a beach area which is mostly tan sand with scattered plants. According to the definition given for fitness, which mouse would biologists consider the fittest? Explain why this mouse would be the fittest.

Color of fur	Black	Tan	Tan and Black	Cream
Age at death	2 months	8 months	4 months	2 months
# pups produced by each female	0	11	3	0
Running speed	8 cm/sec.	6 cm/sec.	7 cm/sec.	5 cm/sec.

If a mouse's fur color is generally similar to its mother's color, what color fur would be most common among the pups?

A characteristic which is influenced by genes and passed from parents to offspring is called **heritable.** Over many generations heritable adaptive characteristics become more common in a population. This process is called **evolution by natural selection**. Evolution by natural selection takes place over many, many generations.

Evolution by natural selection leads to adaptation within a population. The term evolution by natural selection does not refer to individuals changing, only to changes in the frequency of adaptive characteristics in the population as a whole. For example, for the mice that lived in the beach area with tan sand, none of the mice had a change in the color of their fur; however, due to natural selection, tan fur was more common for the pups than for the mother mice.

In summary, a heritable characteristic that helps an animal or plant to have more offspring which survive to reproduce will tend to become more common in a population as a result of evolution by natural selection.

Questions

1. Explain why a characteristic which helps an animal to live longer will generally tend to become more common in the population as a result of evolution by natural selection.