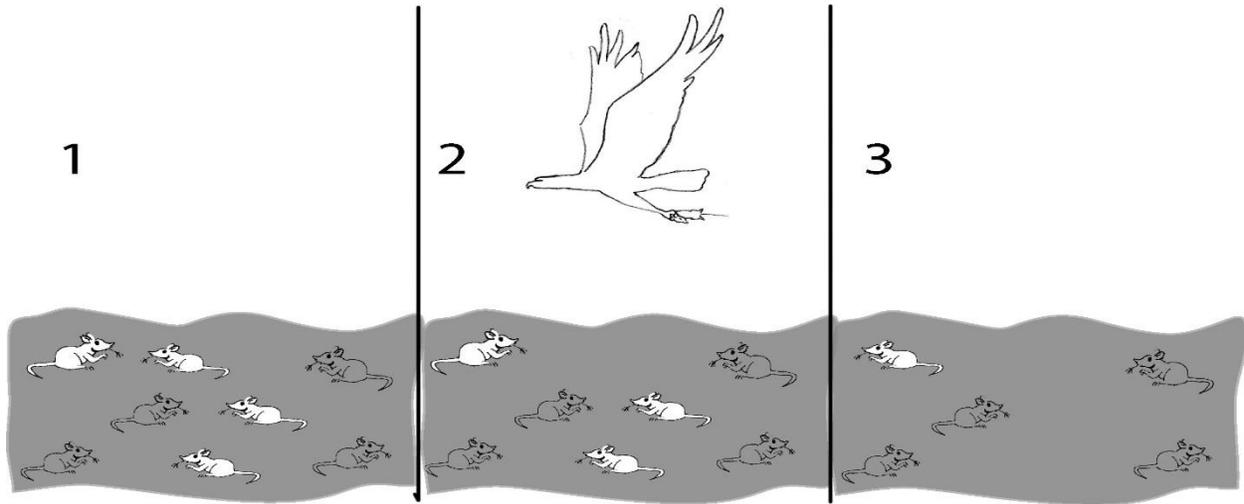


Natural Selection

Of Desert Mice

1. What is happening in these figures? Describe how the population of mice is different in figure 3 compared to figure 1. Explain what happened to cause this difference.



An **adaptation** is any characteristic that increases **fitness**, which is defined as the ability to survive and reproduce.

2. For the mice in the figure, what characteristic was an adaptation that increased fitness?

Suppose a population had three female mice with the following characteristics.

Characteristics of each female mouse	Color of Fur		
	White	Gray	Black
Running speed	5 cm/sec.	6 cm/sec.	8 cm/sec.
# offspring produced by each female	5	19	8
Age at death	3 months	6 months	3 months

3. According to the definition of fitness given above, which of these mice would be the fittest? Explain why this mouse would be the fittest.

4. If a mouse's fur color is generally similar to its mother's fur color, which fur color would be the most common among the offspring? ___ black ___ gray ___ white

A characteristic which is influenced by genes and passed from parents to offspring is called a **heritable trait**. Fur color is a heritable trait for mice.

In general, individuals with a heritable trait that increases fitness produce more offspring than individuals that do not have this trait. Because the trait is heritable, offspring resemble their parents, so more of the offspring will have this adaptive heritable trait. Therefore, over time, adaptive heritable traits tend to become more common in a population. This process is called **natural selection**.

5a. Suppose that one day while the mice were sleeping in their burrows, the gray sand is replaced by white sand. (Perhaps the owner of the desert has a plan to attract more tourists.) Think about what would happen to the population of mice on the white sand. After a year, which color fur do you think most of the mice would have? ___ black ___ gray ___ white

5b. Explain how the change in the color of the sand could eventually result in a change in the most common fur color in this population of mice.

6. When mice live on gray sand, which color fur is an adaptive heritable trait?

When mice live on white sand, which color fur is an adaptive heritable trait?

Notice that the trait which is adaptive differs in different environments.

7. What is natural selection? As part of your answer, explain why an adaptive heritable trait tends to become more common in a population.

TRUE or FALSE:

8. _____ Natural selection occurs if the variation can be inherited.
9. _____ Fitness is defined as the strongest, fastest and/or smartest organism.
10. _____ Adaptations can lead to natural selection.
11. _____ The organisms that survive and have the most offspring are the fittest in the population.
12. _____ Natural selection can lead to speciation (the development of a new species).
13. _____ Natural selection is a random event.
14. _____ Natural selection always acts on the same trait.