

Theory of Evolution by Natural Selection

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CHAPTER

1

Theory of Evolution by Natural Selection

- Explain the theory of evolution by natural selection.



How did dark deer mice become lighter over time?

A species changes color over time if its environment changes. Many other types of changes can take place, too. The darker deer mice evolved into the lighter deer mice in some locations. What do you think changed about the environment?

Biological Evolution

Adaptations in a species add up over time. These adaptations will mean that many genes have changed. If the environment is stable, the species won't change. But if the environment is changing, the species will need to adapt. Many adaptations may be necessary. In time, the species may change a lot. The descendants will be very different from their ancestors. They may even become a new species. This process is called biological evolution but is usually referred to just as **evolution**.

Organisms alive today evolved from earlier life forms. We can learn about this from fossils. For example, horse fossils from 60 million years ago are very different from modern horses. Ancient horses were much smaller than they are today (**Figure 1.1**). The horses' teeth and hooves have also changed. The horses evolved because of changes in their environment.

Although basic horse evolution appears to be linear, there were many more branches. Horse evolution is very well understood.

Natural Selection

Evolution happens because of **natural selection**. Good traits become more common in a population. Bad traits become less common. The deer mouse, species *Peromyscus maniculatus* gives an example of evolution by natural selection. In Nebraska, this mouse is typically brown. But in places where glaciers dropped lighter sand over the darker soil, the mice are light. Why? Because predators could more easily spot the dark mice on light sand. The

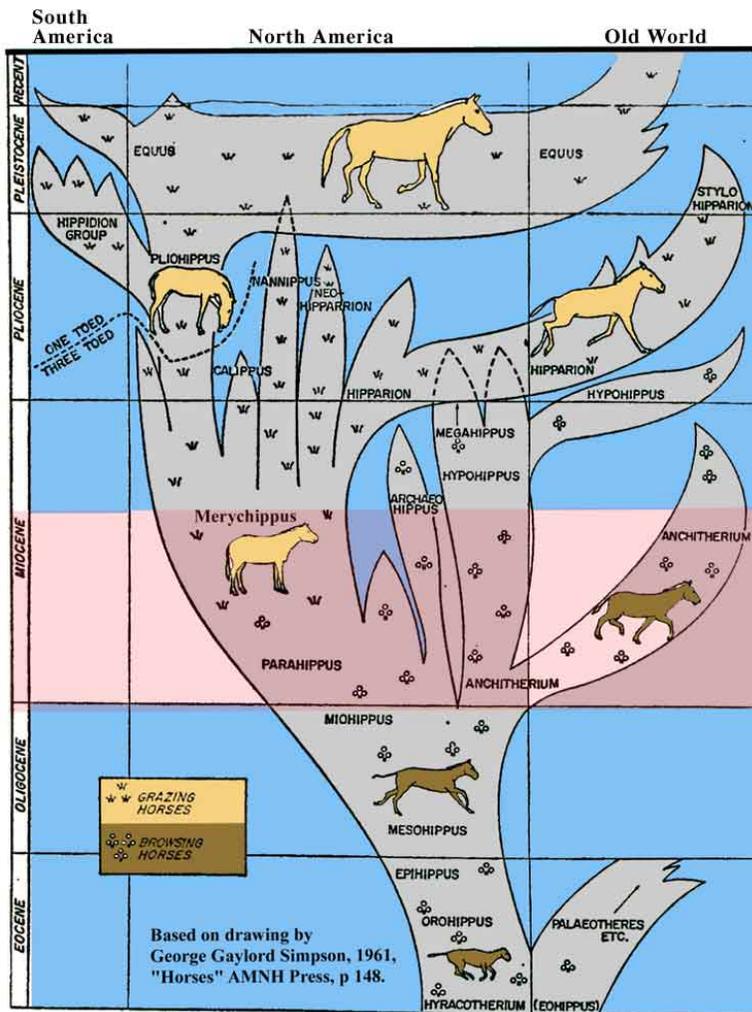


FIGURE 1.1

Ancient horses were quite different from present-day horses.

lighter mice were more likely to survive and have offspring. Natural selection favored the light mice. Over time, the population became light colored. Enough changes may take place over time that the two types of mice become different species.

Summary

- Changes in the genes of a species may result in a new species. This is biological evolution.
- Natural selection can change a species or even make a new species. Natural processes favor some traits over others in a population. This causes those traits to be more common in subsequent generations.
- Evolution just means change over time.

Review

1. Why are some deer mice brown and some lighter colored in Nebraska?
2. Using the example of the deer mice, how does natural selection explain the change with time of darker mice into lighter mice?
3. How does biological evolution work?

Explore More

Use the resource below to answer the questions that follow.



MEDIA

Click image to the left or use the URL below.

URL: <https://www.ck12.org/flx/render/embeddedobject/1502>

1. How do identical twins, who should have exactly the same sets of genes (genome) end up with differences?
2. How are genomes changed and passed on to offspring so that the offspring aren't genetically identical to one or the other parent?

References

1. Courtesy of US Geological Survey. [Ancient horses were quite different from present-day horses](#) . Public Domain