

Read the following passages and answer the questions as you read.

Evidence for Evolution

Evolution is change in living things over time, particularly the change as organisms develop from a common ancestor.

We find evidence for evolution as we look at homologous structures, understanding that organisms have evolved from a common ancestor may have similar structures (such as wings or arms). We also find evidence for evolution in DNA and amino acid sequence similarities. Organisms that are more closely related have more similar DNA and amino acid sequences. As the theory explains, humans and gorillas have 98% of the same DNA. Third, we find evidence in the fossil record. Fossils show us how organisms have changed over time by looking at rock samples from different time periods. Finally, embryology provides evidence for evolution by showing us that organisms that are most closely related have similar development patterns of their embryos.

Questions:

1) In your own words, define evolution:

2) List the four pieces of evidence for evolution:

- 1.
- 2.
- 3.
- 4.

Take a look at the following scenario and answer the following questions:

There are three types of polar bears: ones with thick coats, ones with thin coats, and ones with medium coats. It is fall, soon to be winter. The temperatures are dropping rapidly and the bears must be kept warm, otherwise they will freeze to death. Many of the bears have had two cubs each, but due to the extreme temperatures, many mothers only have one cub left.

Predict: Which bear in the scenario above is most likely to survive and reproduce? Why?

How does evolution occur?

Evolution occurs through a process called *natural selection*. Natural selection is the process by which individuals that are better adapted to their environment are more likely to survive and reproduce than other members of the same species.

In order for natural selection to occur, organisms of a particular species must show *variation*. Variation is the difference of traits (characteristics) in a species. Variation comes from mutations (changes) in DNA. For example, humans show variation in hair color, since some people have brown hair, while others have blond or red hair. This variation was caused by mutations.

3) In your own words, what is natural selection?

4) What does variation mean?

5) What causes variation?

Unit 8 Intro (Evolution/Classification)

Sometimes particular traits give an organism an advantage for survival. Such variation is called an *adaptation*. An adaptation includes any trait that helps the chances of survival and reproduction.

An example:

The variation: Originally, there existed variation in the giraffe species. Giraffes originally had short necks. A random mutation caused some giraffes to be born with long necks. The food giraffes eat is located high in trees, giving long-necked giraffes an advantage for finding and reaching food.

The result: Long-necked giraffes were better able to survive. Long-necked giraffes were therefore able to live long and reproduce, passing on their genes to their offspring. We now only see long-necked giraffes on earth today.

Use the image to the right to answer the following questions:

DISTRIBUTION OF RABBIT FUR COLOR



1. How is variation shown in the population of the rabbits?
2. What caused these rabbits to have different colored fur (what causes variation)?
3. Suppose these rabbits all live in Antarctica. Describe the environment they live in.
4. Which rabbit will be able to best survive and hide from predators (by blending in to the environment) in Antarctica? Why?
5. Predict what the rabbit population will look like in Antarctica in 100 years.

Next example: *There are two types of worms- worms that eat at night (nocturnal) and worms that eat during the day (diurnal). Birds eat worms. The birds eat during the day and seem to be eating ONLY the diurnal worms. The nocturnal worms are in their burrows during this time. Each spring when the worms reproduce, they have about 500 babies but only 100 of these 500 ever become old enough to reproduce.*

1. What variation is shown in the population?
2. What pressure causes some worms to survive better than others?
3. Which worms are best adapted and what can these best adapted worms do?
4. What will the worm population look like in the future?

6) What is an adaptation?

7) Explain how giraffes provide an example of natural selection: