

Natural selection :

[Book pages :220 & 221](#)

[Workbook page 95](#)

<https://www.youtube.com/watch?v=vnktXHBvE8s> 2

https://www.youtube.com/watch?v=BcpB_986wyk 1

Objective

Describe Darwin's theory of evolution by natural selection

page 220

Darwin's theory of evolution

The theory

Darwin's theory of evolution by natural selection depends on a few simple ideas:

- Living things produce many offspring, but most don't survive.
- Every individual is different and some are more likely to survive than others.
- Successful individuals pass their characteristics to their offspring.
- Over time, these characteristics become more common.

Overproduction of offspring

Warthogs like these start reproducing when they are 2 years old. Their numbers could double in size every year if none of their offspring died.

Other animals produce more offspring at a time so their numbers can build up more quickly. One female rabbit can produce up to 40 rabbits in a year.

Why aren't there more of these animals?



↑ Warthogs can double their numbers in a year.

Competition and selection

The number of plants or animals in a population doesn't usually change much. Plants compete for patches of soil, water, and sunlight and animals compete for food and places to live. They both need to avoid being eaten. Most plants and animals die before they have chance to reproduce.

Survival of the fittest

The individuals in a population vary, and some are better adapted to their environment than others. A warthog that could run faster might escape from its predators. It could survive long enough to produce offspring. A cheetah with a better hunting strategy is more likely to catch its prey. It will collect enough food to raise its offspring successfully.

An animal's predators or prey are part of its environment. Other aspects of their environment can also decide which animals survive, such as the temperature, the water supply, and the presence of disease organisms. This is natural selection.



↑ Animals with useful characteristics are more likely to survive.

Inheritance of useful characteristics

Well adapted animals produce more offspring. Their useful characteristics pass to the next generation. Over time, these characteristics become more common and the species changes. It becomes better adapted to its environment. This is evolution by natural selection.

If members of a species become separated, natural selection may turn each group into a different species.

Evolution never stops. As environments change, the characteristics that make species successful change too, so natural selection starts to produce new adaptations.

Resistance



↑ Many rat populations are resistant to poisons that used to kill them.

Since 1950, a chemical called warfarin has been used to be used to poison rats. Like all animals, rats show a lot of variation. Some are not affected by the poison. Whenever the poison is used, it kills most of the normal rats. The resistant ones survive and breed, so they pass the genes that cause their resistance to the next generation. Eventually whole populations of rats can become resistant to warfarin.

- 1 Plants and animals keep producing offspring, but the total number of each species usually stays the same. Why is this?
- 2 List some of the things plants and animals compete for.
- 3 Explain why some animals are more likely to survive than others.
- 4 Give an example of a characteristic that could improve an animal's chance of surviving for long enough to reproduce.
- 5 Explain how evolution by natural selection could have made modern cheetahs run faster than their ancestors.

- Members of a species have different characteristics.
- These make some individuals more likely to survive than others.
- The survivors reproduce and pass their useful characteristics to the next generation.
- Over many generations these characteristics become more common and the species changes.

Page 221

Reading only

Workbook question 1 and 2 page 95:

Members of a species are not all the same. Some have **characteristics** likely to survive and raise **offspring** **generation**. They pass these useful characteristics to the next **generation**. Over many generations these characteristics become more **common**. This gradual change is **evolution**.

characteristics

common

evolution

offspring

generation

2 Link the key words to the correct definitions.

Key words	Definitions
Evolution	The huge number of offspring that most living things produce.
Variation	The way environmental factors like predators and the food supply influence survival.
Overproduction	The way plants and animals change over many generations.
Survival of the fittest	The differences between individuals that make some more likely to survive and reproduce.
Natural selection	The way natural selection can turn populations which become separated into different species.
Species formation	The survival of individuals best adapted to their environments.