

GCSE Biology – Evolution - Transcript

Life on Earth has been evolving for billions of years. But how do small changes between generations lead to the huge diversity of species we see today?

It's explained by the principles of evolution by natural selection. Evolution is the gradual change in inherited characteristics of a species over time.

By the middle of the 1800s many scientists knew these changes occurred but nobody could figure out how.

Then Charles Darwin and Alfred Wallace independently proposed a mechanism that worked. All living things had evolved from simple life forms, like a big family tree.

Their theory was that this occurred by natural selection. So how does it work?

Darwin noticed that individuals within a species show slight variations. In the rabbit population, for example, some may have had slightly longer ears than the others. We now know this is caused by changes in their genes called mutations.

The rabbits with longer ears could hear predators sooner, so they were more likely to escape and reproduce. Their offspring were likely to inherit the genes that give them longer ears, giving them the same advantage.

After many generations of this advantage being passed down, more rabbits in the population now have long ears. That's natural selection: the survival and reproduction of the individuals best suited to the environment. The fittest.

If two groups of the same species become separated they may adapt in different ways. These rabbits are separated from the mainland population on an island.

They have evolved to survive in a different habitat. Their genes can become so different they can no longer breed together to have fertile offspring. They are now two new species.

When this happens over millions of years, the changes can be dramatic. We see evidence of evolution everywhere. Fossils are evidence of how species, like the horse have changed over millions of years.

During the industrial revolution, the population of peppered moths changed colour from light to dark as the trees became covered in soot. Moths with a mutation for darker colouring were harder to find, giving them an advantage.

As a result of evolution most of the moths became darker. And in bacteria, evolution can happen really quickly as they reproduce rapidly. Mutations have made some bacteria resistant to antibiotics.

So, over millions of years nature has been selecting for different traits that help species survive, adapt and change. Leading to the great variety of life we see today.