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Finding your way around the curriculum pack

The pack aims to provide creative teaching ideas within a structured sequence of lessons complete with supporting resources. The pack contains six structured sessions made up of starter activities, main teaching activities, plenary sessions, assessment opportunities and homework suggestions. Where appropriate, cross-curricular learning opportunities are incorporated into each of the teaching sessions.

There are five main aspects covered within the teaching sequence:

- What is evolution?
- What causes evolution?
- The timescale of evolution
- What is adaptation? Animals and plants
- What is extinction?

The pack lends itself to be used in different ways. It could form the basis of a whole week's mini project or form a teaching sequence for a term's work.

We've included links to each separate resource included in this pack so that you can access the resources directly on www.teachitprimary.co.uk. We've also included the file number for each original resource – just pop this into Teachit Primary's search engine. Lots of the resources in this pack are Word documents, but we've also included links to PowerPoints and interactive activities. Please log in first in order to access any of these resources on Teachit Primary.

We hope you enjoy using this pack. If you have any questions, please get in touch: email support@teachitprimary.co.uk or call us on 01225 788851. Alternatively, you might like to give some feedback for other Teachit Primary members – you can do this by adding a comment on the [Evolution Project Pack](#) page on Teachit Primary (please log in to access this!).

Session 3: The timescale of evolution (Statutory requirements covered: 1,2,3)

Purpose: To introduce the changes in the complexity of life over vast periods of time using a time line. To introduce fossils as evidence of changes over time.

Starting things off:

- Not all life forms evolved at the same time or at the same rate. Simple organisms came before more complex living things. Ask the children to consider the order in which the first life forms for each of the four kingdoms appeared. [Resource 22592: The order of evolution](#) provides a detailed breakdown of when life forms evolved. Ask the children if they can add another life form to the timeline and explain how they know it belongs there.

Getting into the detail:

- *Taking it wider – bringing in an expert:*

An ideal introduction would be to arrange a visit from a 'minibeast zoo', which specialises in bringing in small invertebrates, 'dangerous' or scary creatures such as spiders, snakes, giant slugs and maybe even scorpions. Request that your expert visitor tells the children all about the fascinating adaptations and habitats of the animals and ask them to talk about how most of these animals would have had an ancient edition of themselves, usually one that was much larger, like the scorpion or centipede.

- Take the example of a scorpion (a member of the arachnid family) which first appeared on the earth around 400 million years ago. Explain that we know this because of the fossils that have been found and that examination of these fossils has shown that modern scorpions have barely changed the way they look, so some might consider this to be evidence that there has been no evolution. However, scorpions today live on land and grow up to 23cm long whereas early scorpions inhabited water and could grow up to 2.5 metres in length!

Over time, scorpions have become more successful as land predators, and their smaller size means they can easily hide, don't require as much food and can survive by catching smaller prey. Environmental facts also play a part in evolution; the Earth was much warmer when these gigantic scorpion beasts were around but, now that it is cooler, scorpions of that size would not be able to keep warm.

- When you reach the most recent part of the timeline, share this interesting fact: if you squashed all the time that life has been on Earth into 24 hours, humans would only have been around for 2 seconds! By comparison, dinosaurs were around for 35 minutes (2100 seconds)! Humans are a very new life form but even within this relatively short timeframe man has already undergone dramatic evolutionary changes. Use the [Natural History](#)

[Museum's 3D hominid skulls interactive](#) to show examples of early human skulls. Ask the children to list similarities and differences between the skulls, focusing on features such as eye sockets, brain cavity size and teeth. Relate these changes to diet and levels of intelligence.

- *Taking it wider – cross-curricular learning opportunities: Literacy*

Charles Darwin is credited with being the man who came up with the theory of evolution, although some would argue that Alfred Wallace was thinking along the same lines at the same time. Take either of these famous naturalists and research their lives and achievements to create biographies. [Resource 22593: Charles Darwin Biography](#) provides a reading comprehension activity that works well as an example of a biography as well as providing background knowledge.

Rounding things up:

- Environmental evolution is driven by a need to survive – failure to evolve in response to environmental changes or other threats will reduce a species' chances of survival. Ask the children if they think that humans will survive as long as the dinosaurs did? Would humans have managed to stop an asteroid impact? Will humans pollute the Earth so much that it will be impossible to live on?

Assessment opportunity:

- Provide the children with a selection of photographs or plastic models. Ask them to sort them by asking the question 'Which came first the ... or the ...?'

Taking it home:

- Using a long strip of paper, ask children to produce their own personal timeline, including when they were born and other significant changes and events that have occurred. Remind them that the timeline will need to be equally measured out to show the passing of each year.

Resources contained within Session 3

22592 The order of evolution	17
22593 Charles Darwin Biography.....	18



To access this resource please [log in](#) to the [Teachit Primary website](#) and type [22592](#) into the search bar.

Taking a look at how life on Earth has changed over billions of years.

3.5 billion years ago, single-celled life, bacteria

1 billion years ago, multi-cellular life, moulds

600 million years ago, simple animal life

500 million years ago, simple fish and land plants

400 million years ago, insects and plants with seeds

360 million years ago, amphibians

All life evolved from single-celled organisms!

Moving forward in time ...

Life in the last few hundred million years...

300 million years ago, reptiles

200 million years ago, mammals

150 million years ago, birds

130 million years ago, flowers

Moving back in time ...

More recent living things are very complex.

Moving forward in time ...

Life in the last few million years...

60 million years ago, primates

20 million years ago, great apes

2.5 million years ago, early humans

200 thousand years ago, modern humans

Moving back in time ...

More recently, humans evolved from apes.

A biography of Charles Darwin

(1809-1882)

Born in Shrewsbury in 1809, British scientist Charles Darwin became one of the most famous naturalists in the world. His ideas changed the way people think about nature and the living things that thrive in every environment on the planet Earth. Most notably, Darwin shocked many people with his ideas that human beings are directly descended from animals such as apes.

1859 was a time when people's thinking about the world was based on the story of Genesis in the Old Testament of the Bible, a Christian point of view, which describes how god created the world in seven days. Darwin's research and the document he wrote, called 'On the Origin of Species by Means of Natural Selection', shocked everyone. The idea that humans were simply animals that had evolved, like all those animals around them, was hard for people to believe. Not least the Church which attacked Darwin's ideas, which went against its beliefs and teachings.

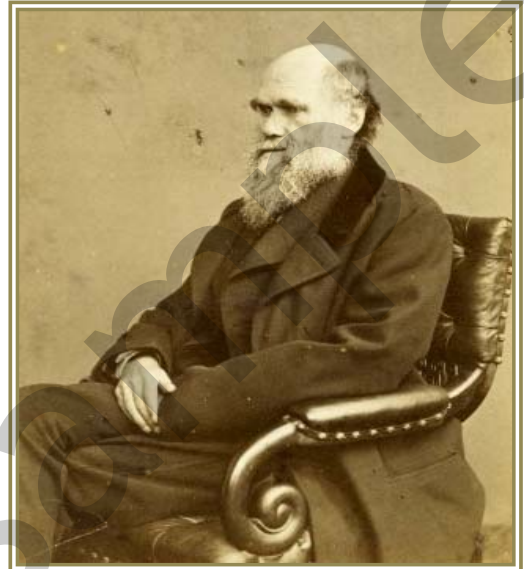


Image credit Wellcome Library, London

So how did Charles Darwin come to such a radical idea? During a scientific expedition to The Galapagos Islands in 1831, Darwin first began to think and read about fossils being possible evidence for ancient life on Earth. The Galapagos Islands are located about 500 miles west of the coast of South America. Here the animals had been isolated from the mainland and so had developed (evolved or adapted) their own unique characteristics. Once there, Darwin was enthralled by the vast array of distinct life forms around him. Many of the animals and plants here were unique.

Gradually, through observing species here and elsewhere, Darwin concluded that animals change to suit their environment over periods of time and that these changes take place over vast amounts of time. He came up with a theory of **natural selection** – where a species only survives if it conforms to the changes in nature around it. These changes might be in the food chains or in the environment. Darwin pondered on his ideas for 20 years before making a joint announcement with fellow scientist, Alfred Russel Wallace (who had similar notions).

Now, over 150 years later, Darwin and Wallace's theories are the accepted explanation of how life around us, including ourselves, has evolved to fit in with nature's ever-changing ways. Darwin, because of his careful evidence-based work, is regarded as one of the most respected scientific thinkers of the past few hundred years.

Identifying features of a good biography

Look back carefully at the text and try to identify some key features shown within this biography. Write down a quote from the text to demonstrate how and where they are used.



a) Time connectives and dates

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b) Introductory paragraph and concluding paragraph

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c) Key events, journeys, experiences and moments of tension

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d) Heroism, standing up for something, thinking differently

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e) Changing the world, discovering something new

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f) Doing something that is very difficult

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g) Facts about the person's life

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Thinking about what you have read

Try to refer back to the text in your responses.

1) What first led Darwin to come up with his ideas about evolution?

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2) Why do you think people still respect Darwin today?

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3) Why didn't people accept Darwin's ideas when he first proposed them?

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4) Make a short timeline or list of the main events of Darwin's life from the biography.

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5) What was the key idea that most offended people about Darwin's thinking?

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6) Why do you think Darwin waited twenty years before publishing his ideas?
Think of two reasons.

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