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Opening extract from

Tree of Life

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The Tree of Life



Do you have a family tree that shows how the members of your family – aunts, cousins, grandparents and so on – are related?



The Tree of Life is like a family tree for all living things. It shows us biodiversity, which is the incredible variety of life on Earth. It shows us how all living things are related – from bacteria too small to see with the naked eye to the largest mammal, the blue whale.

So far, scientists have discovered and named 1 750 000 different species. A species is a group of living things that share similar characteristics. Scientists do not agree on the exact number of species – there are just too many to be sure. The numbers in this book are based on their best estimates. If every species were represented by a leaf, there would be 1 750 000 leaves on the Tree of Life. All those leaves would be related, some closely and others more distantly.

Every part of the Tree of Life is important. A problem with one branch, one twig or even just one leaf may affect the whole tree. In this book we explore the Tree of Life and its branches. This will help us to understand our place within the Tree of Life and our impact on it.

The five branches



The Tree of Life is a way to organize, or classify, all living things. By organizing them into different branches, we can better understand how closely – or distantly – they are related.

The Tree of Life is often divided into five main branches called kingdoms.

Kingdom Monera
bacteria

Kingdom Fungi
mushrooms, toadstools, moulds, yeasts, mildews, etc.

Kingdom Protoctista
paramecia, amoebas, algae, etc.

Kingdom Plants
flowering plants, mosses, ferns, etc.

Kingdom Animals
from invertebrates, such as sponges and spiders, to vertebrates, such as fish, amphibians, reptiles, birds and mammals

Each kingdom on the Tree of Life has a story to tell us about biodiversity and life on Earth.

KINGDOM

Fungi

72 000 species

Would you recognize a fungus? You've probably seen or even eaten one today. Every time you bite into a piece of bread, you are eating yeast, a species of fungus. Scientists believe that as many as one million more fungi species have yet to be discovered.

Some fungi are parasitic – they grow on other living plants and animals and take their nutrients from them. But most fungi are decomposers – they take nutrients from dead plants or animals. Decomposers are the recyclers and cleaners on the Tree of Life.

Imagine a forest in the autumn, with billions of leaves falling to the ground. Where do all these leaves go? Fungi (and some bacteria) help to break them down and absorb them as food. And as they do this, they create carbon dioxide, which plants use to make their own food.

Without fungi, the Tree of Life would become buried under its own leaves.

Fungi species

30 000 sac fungi (truffles, morels, yeast, lichen, etc.)
22 250 club fungi (mushrooms, toadstools, puffballs, etc.)
17 000 imperfect fungi (penicillin, candida, etc.)
600 conjugation fungi (black bread moulds, etc.)
... and others



Fungi – 72 000 leaves on the Tree of Life

What are lichens?
Lichens are usually combinations of fungi and tiny plants. They are very sensitive to toxins (poisons) in their environment. When lichens start to die, it's an early warning signal that pollution levels may be high in that area.

How large can fungi grow?
One of the world's oldest and heaviest fungi is an *Armillaria bulbosa* which lives beneath a forest floor in Michigan, in the United States. This 1500-year-old fungus may be heavier than an African elephant, but all you can see of it are tiny shoots poking up from the ground. The smallest puffball fungus is about the size of a chicken egg. The biggest is the size of a watermelon.



British soldier lichen



Puffball



Armillaria bulbosa

