

## Knowledge Organiser

Year Group	Subject	Topic
6	Science	Classifying living things

### The Big Picture

Living things are divided into groups, with members of each group having similar features. The obvious first grouping is animal or a plant.

Animals can be divided into invertebrates and vertebrates.

In this topic we will consider the other three groups: fungus, monera (microbes) and single-celled organisms called protists. Each time we divide up the living things by particular characteristics, the groups become smaller until we end up with the organism being 'identified'.

### Enquiry Question

What questions can you use to structure your classification?

Can you make a set of identification cards to help children in Year 4 classify and identify plants and animals in the school grounds or local environment?

How did Linnaeus's work help scientists who were arguing and could not decide the best way to classify living things?

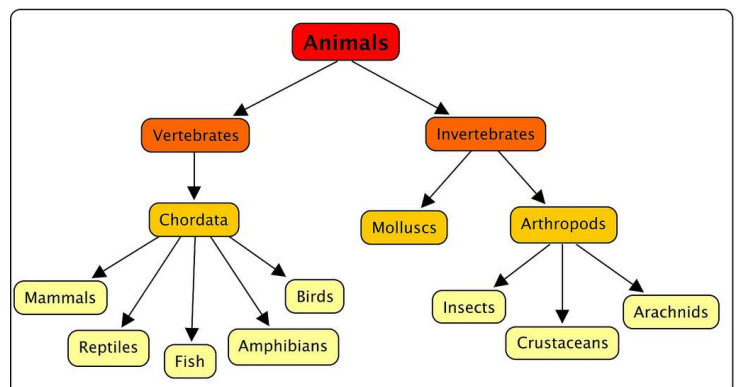
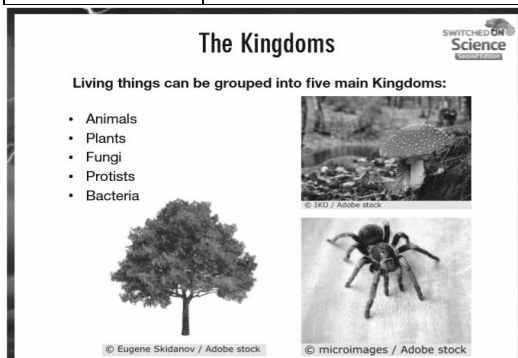
Why are bacteria sometimes good and sometimes bad?

### Key Vocabulary

<b>amphibian:</b>	an animal with an internal skeleton that lives both in and out of water
<b>bacteria:</b>	single-celled organisms, most of which can only be seen with a microscope
<b>bird:</b>	an animal that can often fly and has an internal skeleton
<b>fauna:</b>	living things that are animals
<b>fermentation:</b>	a change brought about by ferment (e.g. yeast into alcohol)
<b>fish:</b>	an animal with an internal skeleton that lives in water and has gills
<b>flora:</b>	living things that are plants
<b>fungi:</b>	taxonomic kingdom comprising all the fungus groups and sometimes also the slime moulds
<b>toadstool:</b>	any of various mushrooms having a stalk with an umbrella-like cap

<b>genus:</b>	the group that an organism belongs to
<b>insect:</b>	an animal with six legs
<b>invertebrate:</b>	animal without a backbone
<b>mammal:</b>	an animal that gives birth to live young
<b>microbe:</b>	tiny single-celled bacteria
<b>mushroom:</b>	any of various fleshy fungi including the toadstools, puffballs, coral fungi and morels
<b>organisms:</b>	living things
<b>reptile:</b>	are animals that are cold-blooded. Most reptiles lay eggs and their skin is covered with hard, dry scales
<b>species:</b>	the sub-group within the genus that an organism belongs to

### Classification



## Animals

The animal kingdom can be divided into two broad groups based on whether they have a backbone (vertebrate) or not (invertebrate). Invertebrates range from totally soft-bodied animals such as sponges and jellyfish, shelled animals such as mussels and barnacles, to complex spiders and insects. Some invertebrates have an exoskeleton (exo = external or out), some have no hard structures at all.

Invertebrates are subdivided into protozoa, annelids (worms), echinoderms (sea urchins), molluscs and arthropods (insects, crustaceans and arachnids).

## Plants

The plant kingdom can also be divided into two groups, flowering and non-flowering plants. Flowering plants include sunflowers, roses and lilies, and non-flowering include mosses and ferns. There are some obvious differences between plants and animals. Plants are green and they can photosynthesise, whereas animals cannot. Photosynthesis is the process by which a plant uses the energy from the light of the sun to produce its own food. Organisms such as coral are often thought to be plants, when in fact they are animals, but this can only be seen at the cellular level.

## Fungi

Fungi are not plants. They are in fact a separate kingdom. Many fungi play the role of decomposers, breaking down plant and animal material. Mushrooms and toadstools are the reproductive parts – they appear above ground to spread spores. Mushrooms forming a fairy ring







are usually all part of the same single organism. The mould that grows on our food is also a type of fungus. Other single-celled fungi, such as yeast, ferment sugar and produce ethanol (alcohol) and carbon dioxide gas. They are very important in making bread, as the gas causes bubbles in the dough and makes the bread rise. Prokaryotes, including bacteria Prokaryotes are the group that bacteria (and bluegreen algae) belong to. Bacteria are a large and diverse group of single-celled organisms without a nucleus. They are microscopic and found almost everywhere on Earth. They can live in extreme environments, from boiling hot springs to deep in the oceans and even grow on nuclear waste. They are found in the intestines of many animals, including humans, and aid digestion. Other bacteria can cause infectious diseases such as cholera, tuberculosis and bubonic plague. Bacterial infections can be treated by antibiotics.

## Protoctists

These are single cells or groups of single cells, the most well-known are amoeba and slime moulds. They are all single-celled organisms that are not bacteria.

## Carl Linnaeus and classifying organisms

Carl Linnaeus (1707–1787) invented the two-part naming system that is used to classify species of living thing. Linnaeus realised that new plants were being discovered and named, but nobody gave much thought to which family or group they might belong to, or resemble. He started to classify plants into 24 classes according to the number and position of their stamens and pistils. Although later botanical knowledge revealed that this system was inadequate, it did lay the foundation for the science of plant taxonomy.

Domain	Bacteria	Archaea	Eukarya			
Kingdom	Bacteria	Archaea	Protista	Fungi	Plantae	Animalia
Example						
Characteristics	Bacteria are simple unicellular organisms.	Archaea are simple unicellular organisms that often live in extreme environments.	Protists are unicellular and are more complex than bacteria or archaea.	Fungi are unicellular or multicellular and absorb food.	Plants are multicellular and make their own food.	Animals are multicellular and take in their food.

