# The 5 Kingdoms

At the start of unit 4, we learnt about two types of organisation, can you remember what you wrote in your NSD?

[Hint: Use Ctrl+F on your NSD to search for "categories"].

All living things on Earth are divided into groups for the second reason you wrote in the introduction to unit 4. The Greek thinker Aristotle was one of the first people to sort organisms into groups (Ucmp.berkeley.edu, 2015) based upon their characteristics (what they look like). This is called **classification**. Today scientists have classified over 1.75 million different living things. The main groups are known as "Kingdoms" Can you find their names in this word-search?

The **classification system** begins with very big groups that include a lot of organisms and then moves down to smaller groups made up of fewer organisms. The biggest groups are called the kingdoms. All living things are classified into fivedifferent kingdoms.
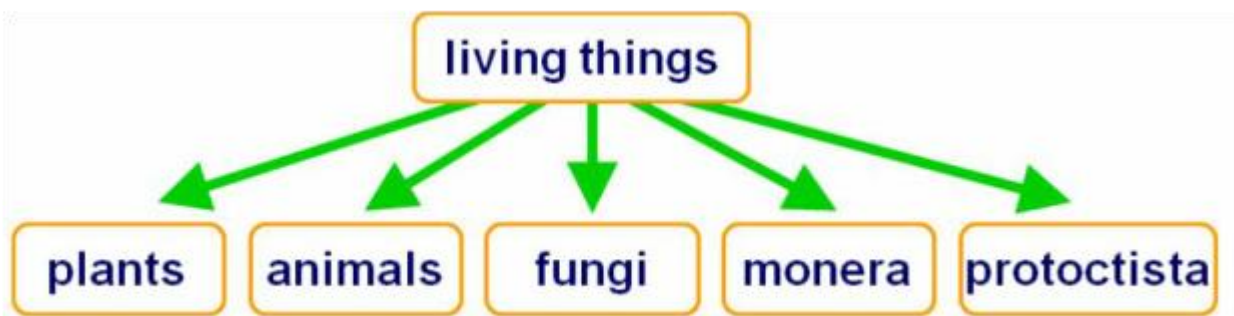
With over 1.5 million different types of living thing on Earth, scientists find it convenient to divide things into groups. The largest of these groups are called **kingdoms**. All living things belong to one of five different kingdoms: **plants**, **animals**,**bacteria**, **fungi** and **protoctists**. The two largest kingdoms are the plant kingdom and the animal kingdom.

Each kingdom is split into more groups called **phyla** (singular = **phylum**). The animal kingdom is divided into seven phyla. Humans are in the **vertebrate phylum**. All the animals in the vertebrate phylum have skeletons and a backbone, and are known as **vertebrates**. The animals in the other six phyla do not have backbones and are called **invertebrates**.

The vertebrate phylum is divided into five **classes**: amphibians, birds, fish, mammals and reptiles. The classes are divided into even more groups!

The two smallest groups are the **genus** and the **species**. Lions belong to the genus *Panthera* which is a group containing only big cats. The species that lions belong to is called *leo*. Only lions are in the species *leo*. Scientists give lions a name in Latin,*Panthera leo*. This name is the same all over the world, whereas the word 'lion' is

different in different languages. The Latin name avoids confusion.

This way of naming things, with two Latin words, was originally developed in 1735 by **Carl Linnaeus** (1707–1778). He used Latin because all the scientists of his day wrote in Latin!

Task 4a:

a) Under a suitable heading your NSD, write an introduction to the 5 Kingdoms and list their names using **bullet points.**

b) Create a 5 x 3 table with the names of the 5 kingdoms, a picture of each, and details about their characteristics using information from following video:

C) Answer the following questions:

1   What are the names of the five different kingdoms?
2   A kingdom is divided into more groups. What are these called?
3   What are animals that do not have a backbone called?
4   Write down **a** which kingdom, **b** which phylum and **c** which class humans belong to.
5   Why is classification so useful?
6   Humans are called *Homo sapiens* by scientists. Which one of these words is the genus name for humans?
7   Who developed this way of naming things?
8   What do you notice about the way that the genus and species names are written in the text above? *Hint:* there is more than one thing that you should notice!
9   Using a dictionary or science book, try to find out what the words '*Homo*' and '*sapiens*' mean.

Extension: Check your reference looks like the one at the bottom of the page for Gaffney, 2011.

**Task 4b: 5 Kindoms Summary Mindmap.**

This task can be done by hand on paper, or in a Google Doc. If you want to experiment with your NSD read on, OR draw a mind-map to summarise the 5 Kingdoms by hand.

- In your NSD, click "Add-ons", then "Get Add-ons". Search for "Mindmeister" and Click "Free", then "Accept".

- This App can be used to create mind-maps from bullet-point lists.

- Click "More" on the toolbar and select the bullet-point option. Next to this is "Increase indent".

- Experiment how the App works with different indentations in your list by highlighting your list, clicking "Add-ons", "Mindmeister" and "Insert as Mindmap".
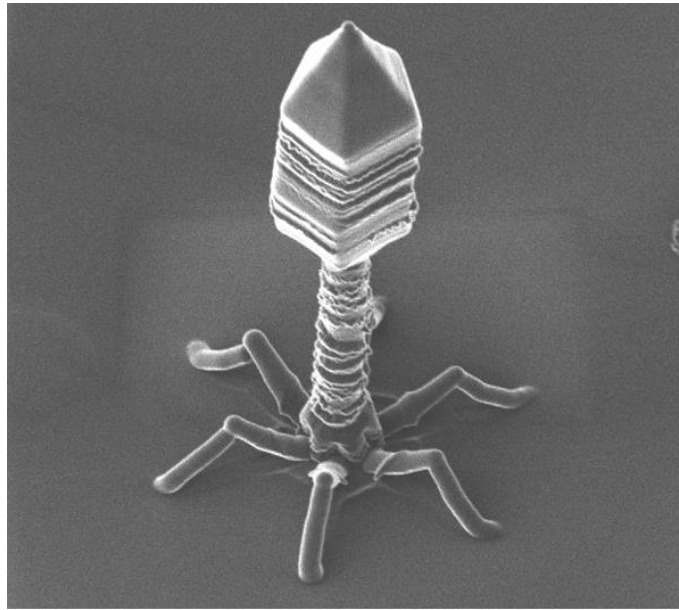- You can also watch this video.
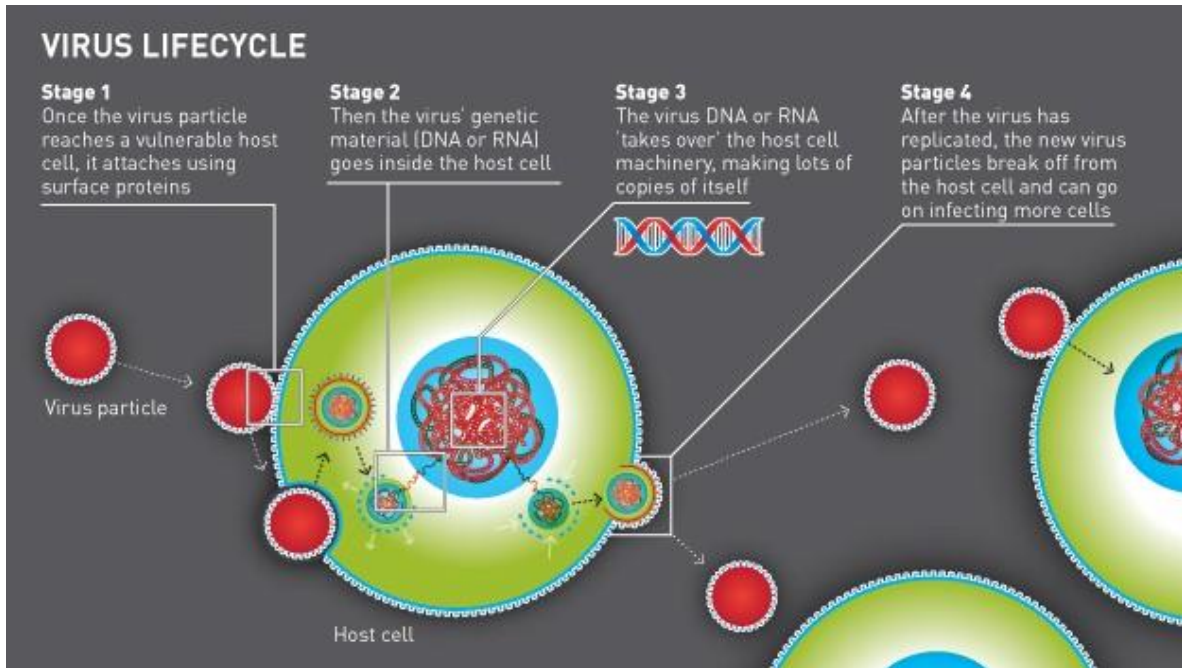
Robert H. Whittaker (1969)
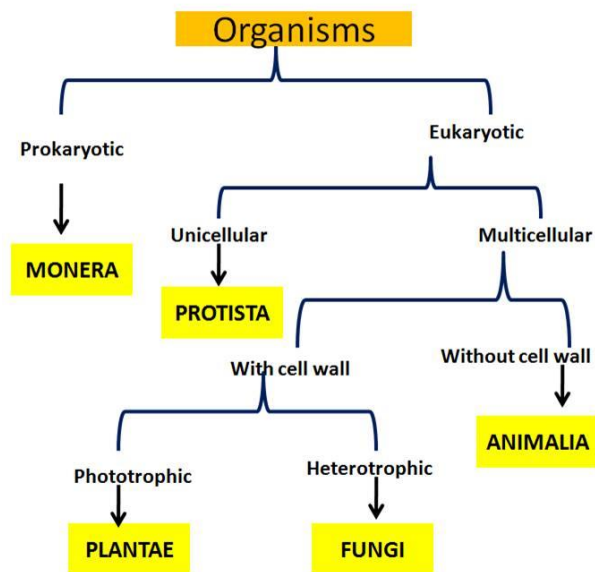
(BIOLOGY4ISC, 2015)

Is a virus alive?

A virus is a small particle that invades cells of living organisms. Once inside the cell, a virus uses the cell´s organelles to make more copies of itself. It cannot do this alone: a virus is unable to grow or reproduce outside a host cell.

Because of this it does not fit the definition of a living thing as all living things can grow and reproduce.

(News.bbcimg.co.uk, 2015)

VIRUS LIFECYCLE

Stage 1
Once the virus particle reaches a vulnerable host cell, it attaches using surface proteins

Stage 2
Then the virus' genetic material (DNA or RNA) goes inside the host cell

Stage 3
The virus DNA or RNA 'takes over' the host cell machinery, making lots of copies of itself

Stage 4
After the virus has replicated, the new virus particles break off from the host cell and can go on infecting more cells

Virus particle

Host cell

(Easyscienceforkids.com, 2015)
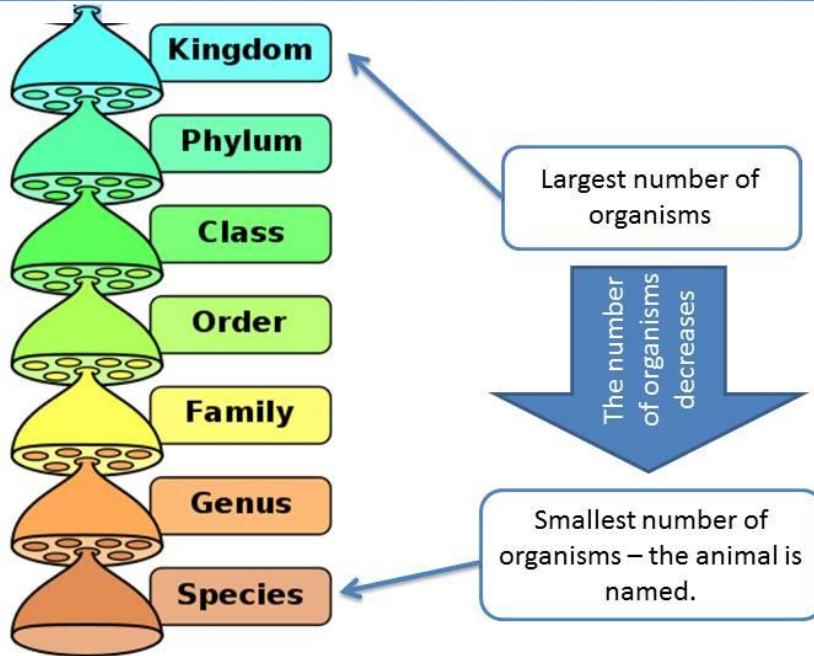

Can you identify each of the organisms in the pictures?

What characteristics allow you to identify them?

The Classification Ladder

We can further classify an organism into these subgroups.

Kingdom
Phylum
Class
Order
Family
Genus
Species

Largest number of organisms

The number of organisms decreases

Smallest number of organisms – the animal is named.

Each kingdom is divided into **divisions** (for plants) or **phyla**(for animals); which can be divided into **orders**. Each orderis is made up of **families**; families are divided into **genus**and the genus into **species**.

Example: Humans

Kingdom: Animalia
Phylum: Vertebrate
Class: Mammal
Order: Primate
Family: Hominid
Genus: Homo
Species: Homo sapiens

Click here to do an activity to classify organisms

The importance of biodiversity.

The conservation (preservation) of habitats and species in order to maintain biodiversity (variety of life) is of vital importance to the interdependence and survival of all living organisms –since, living organisms affect each other directlyor indirectly.

Actions taken at local, national, and global levels to conserve species (animals, plants, and microorganisms) and maintain biodiversity are important for Economic, Ecological, Ethical, Aesthetic and Agricultural reasons.

Task 4d:

Below are some examples of the different criteria. Create a table with 5 columns and copy and paste the examples under the correct headings.

- Disruption of food chains–e.g. herring salmon bear–loss of salmon would endanger the bear population and cause an increase in the herring population
- Attractive environment –for leisure, tourism (economic advantage)
- Production of crops and livestock for food
- Source of edible food and some drinks (e.g. milk) for humans and livestock
- Religious & spiritual–coexistence & harmony with the natural world
- Clothing & footwear–e.g. cotton (plants) & leather (animals
- Loss of habitats–e.g. hedgerows (wildlife corridors –enable organisms to move between different habitats safely; removal can cause isolation of species and loss of food and nesting sites for many species
- Deforestation–leads to climate change (global warming;) disrupts habitats
- Moral issues -not to interfere with nature; right to exist; moral responsibility to conserve for future generations
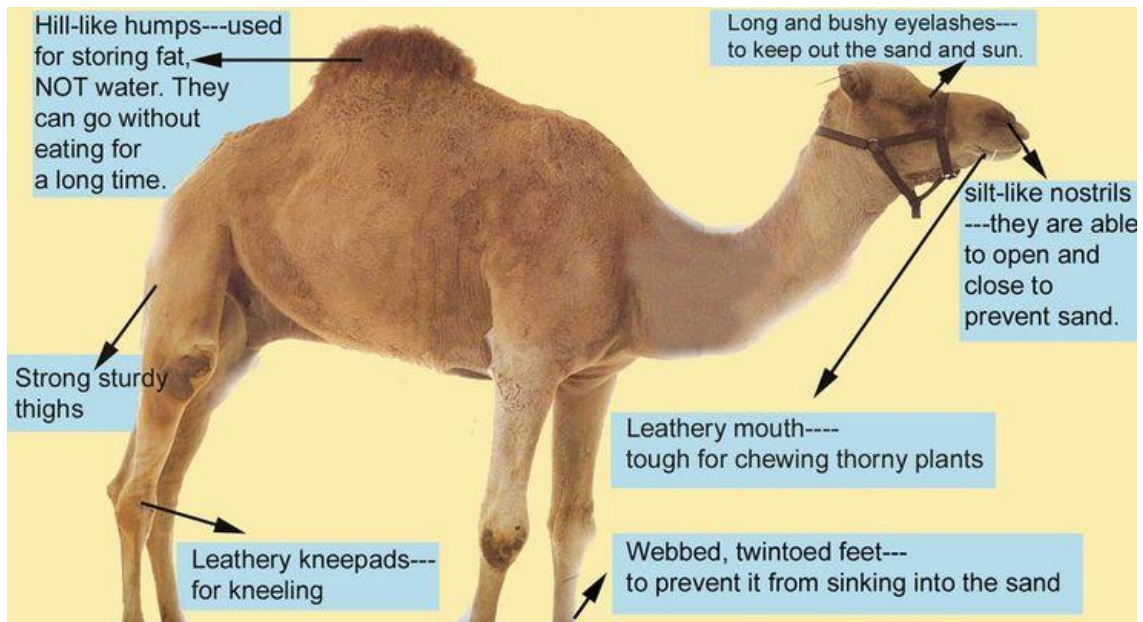- Wider range of food sources in cases of disaster (e.g. potato famine of 1845)

Adaptations

Organisms need to have special features which help them to survive in their habitat. These special features are calledadaptations. For example, you have plenty of adaptations to survive in your habitat. Your fingers are an excellent adaptation. Without their ability to grip you would not be able to do all of that schoolwork! Some adaptations are obvious while others are not so obvious. Can you think of any other adaptations that you have?

These organisms are all adapted to their environments in different ways. How are they specially adapted to survive?

How is a camel adapted to its environment?

Hill-like humps---used for storing fat, NOT water. They can go without eating for a long time.

Long and bushy eyelashes---to keep out the sand and sun.

silt-like nostrils ---they are able to open and close to prevent sand.

Strong sturdy thighs

Leathery mouth---- tough for chewing thorny plants

Leathery kneepads--- for kneeling

Webbed, twintoed feet--- to prevent it from sinking into the sand

(pinimg.com, 2015)

Task 4e:

Scientists have discovered this strange new species on a small island off the coast of Argentina.

The scientists want you to help them describe where this animal lives (land, water or air), what it eats, how it eats, how it breathes, how it moves and last, but not least, what they should call it.

As the organism is adapted to its environment you should be able to use the way it looks to answer all of these questions in your NSD. Don't forget to give your organism a name!
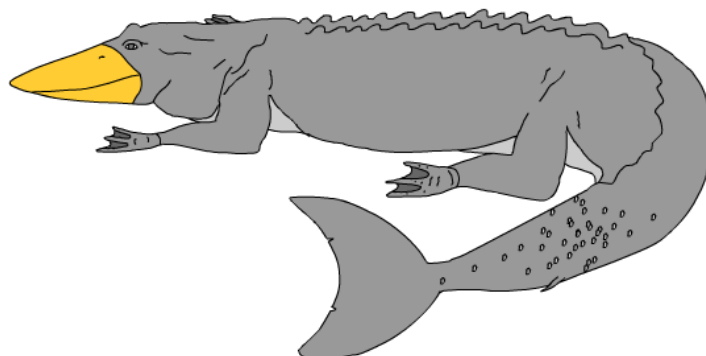
How to identify living things

If scientists divide organisms into groups based on the differences and adaptations, we can use those visible characteristics to help identify living things. All we need to do is ask questions that help us work through an *identification key*.
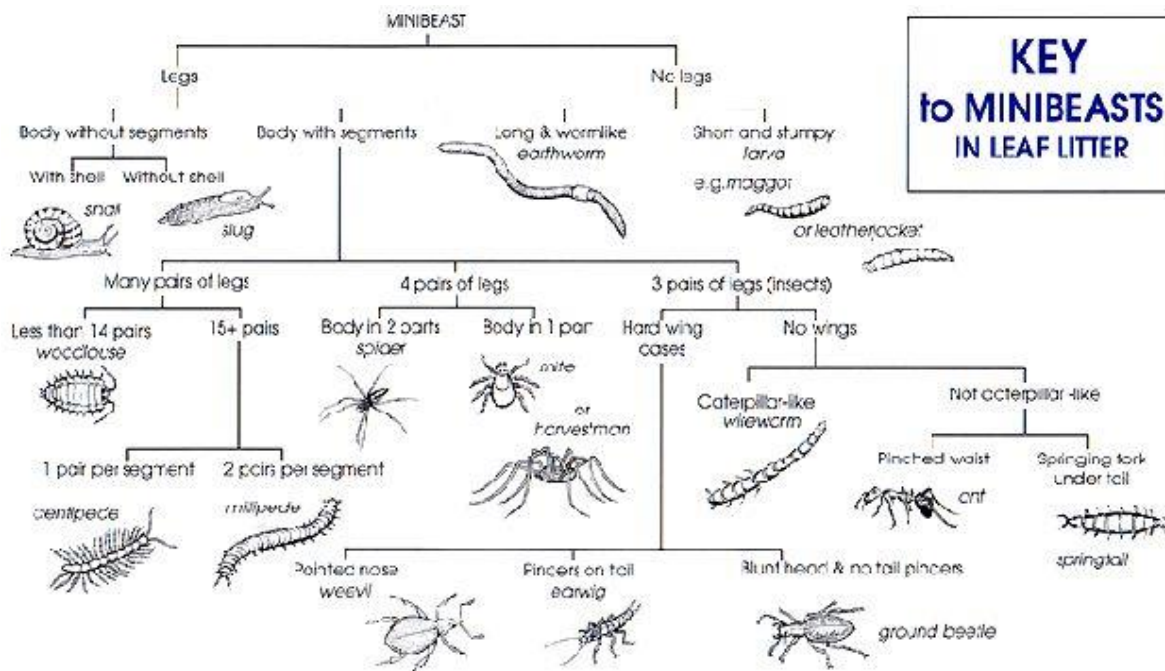
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