

BOOK 3

# OUR PLANET

SECTION 2

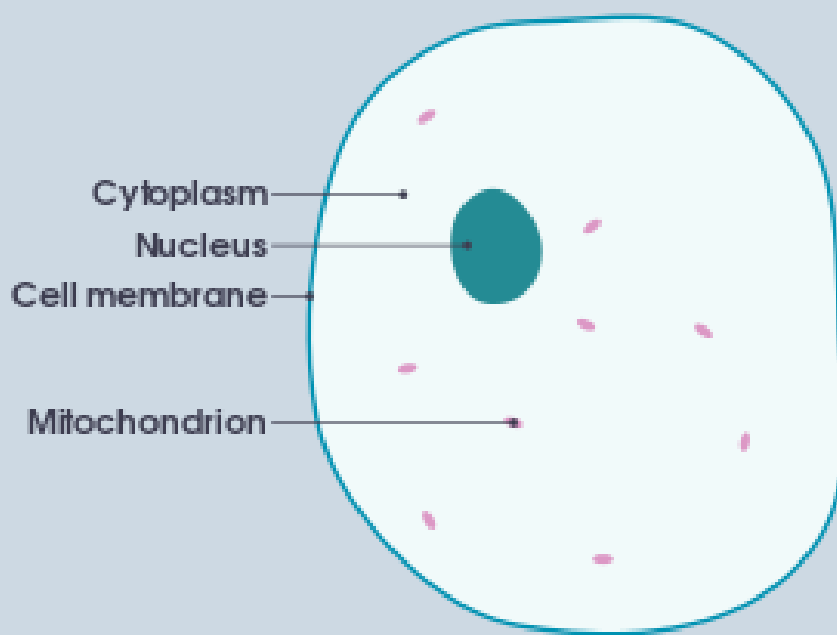
WORLD OF LIFE

## **ANIMAL AND PLANT CELLS**

There are two general types of cell - the animal cell and the plant cell. The animal cell is the most basic with the fewest parts. The plant cell has more parts.

### **THE ANIMAL CELL**

The basic animal cell is made up of three main parts (organelles) - the cell membrane, the nucleus and the cytoplasm. There are other parts but you don't need to know about them.



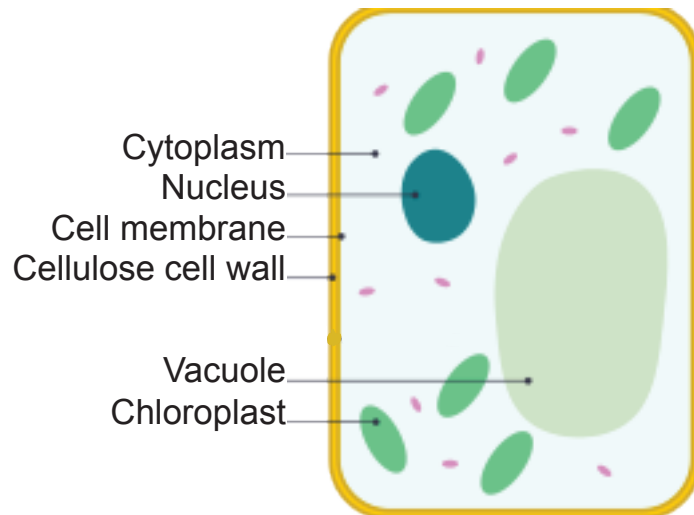
#### **Animal cell**

Simple diagram of an animal cell, Wikimedia CC, <http://bit.ly/2ehDXkX>



### THE PLANT CELL

The plant cell is made up of many more parts (organelles) than animal cells, some of which are common with animal cells. The plant cell is made of a cell wall, cell membrane, vacuole, nucleus, cytoplasm and chloroplasts (which contain chlorophyll).



#### Plant cell

Simple diagram of a plant cell, Wikimedia CC, <http://bit.ly/2e2BfSx>

## THE FUNCTION OF THE ORGANELLES

Animal cell		Plant cell	
Organelle	Function	Organelle	Function
Nucleus	Contains chromosomes which carry genetic information.	Nucleus	Contains chromosomes which carry genetic information.
Cell membrane	Controls the entry and exit of substances.	Cell membrane	Controls the entry and exit of substances.
Cytoplasm	The site of most cell reactions.	Cytoplasm	The site of most cell reactions.
		Cell wall	Made of cellulose and provides structural support.
		Vacuole	Contains a watery sugar solution called sap. A swollen vacuole pushes the cell contents against the cell wall making the cell firm.
		Chloroplast	Contains chlorophyll and is the site of photosynthesis.

## **LEVELS OF ORGANISATION**

In single-celled organisms, one cell carries out all life processes. However, in organisms made of multiple cells (multicellular), the cells have various levels of organization. Individual cells may work together to carry out a specific role in the organism.

Multicellular organisms have 5 levels of organization:

### **CELLS**

- the basic unit of structure and function in living things
- may serve a specific function within the organism
- examples - blood cells, nerve cells, bone cells etc.

### **TISSUES**

- made up of cells that are similar in structure and function and which work together to perform a specific activity
- examples - blood, nervous tissue, bone etc.

### **ORGANS**

- made up of tissues that work together to perform a specific activity
- examples - heart, brain, skin, etc.

### **ORGAN SYSTEMS**

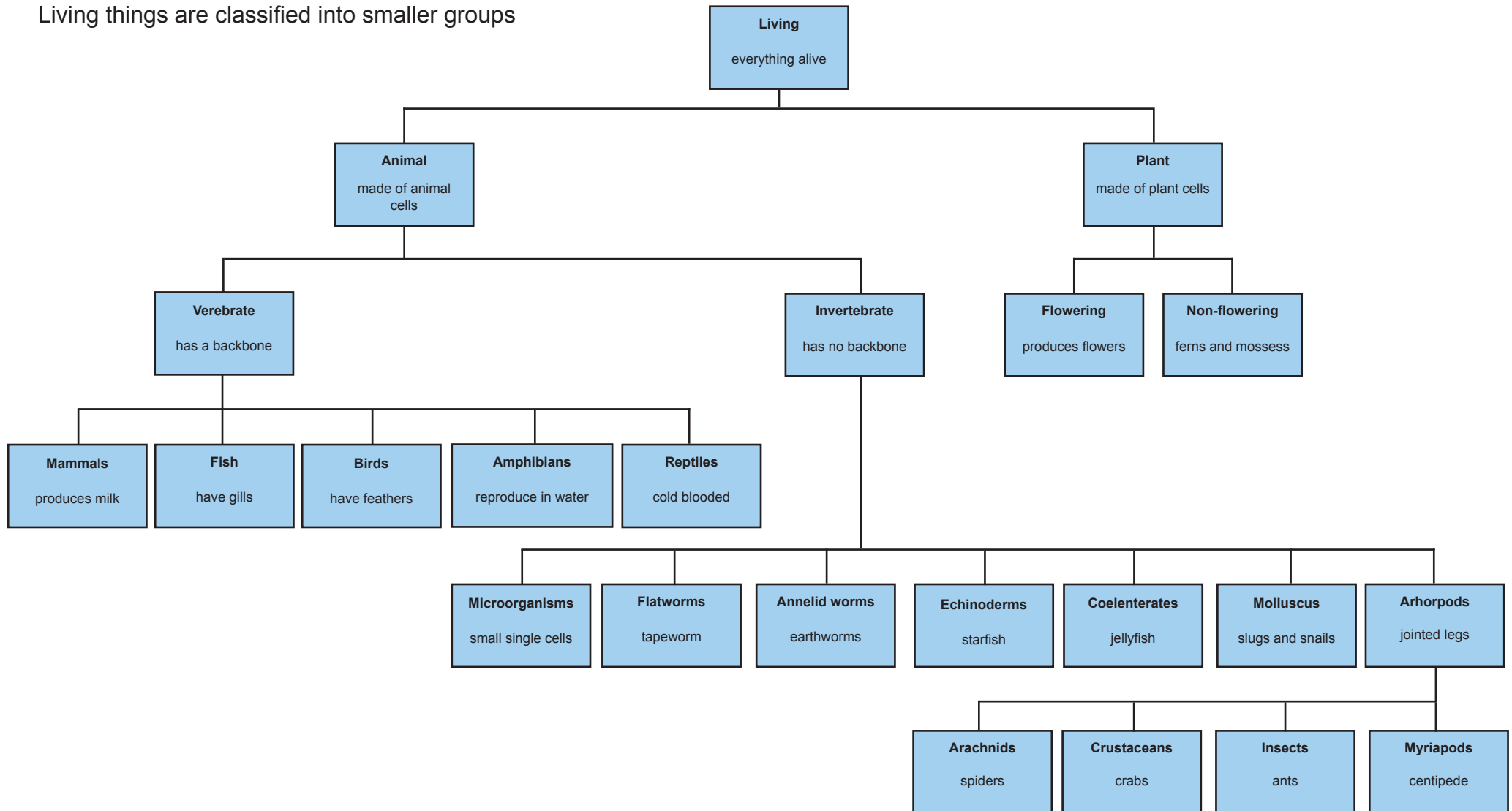
- Groups of two or more organs that work together to perform a specific function in the organism
- examples - circulatory system, nervous system, skeletal system, etc.

### **ORGANISMS**

- Entire living things that can carry out all of the basic life processes. This means that they can take in materials, release energy from food, remove waste, grow, respond to the environment, and reproduce.

### CLASSIFICATION OF ORGANISMS

Living things are classified into smaller groups





## GROUPINGS

The different groups of organisms are classified based on characteristic features.

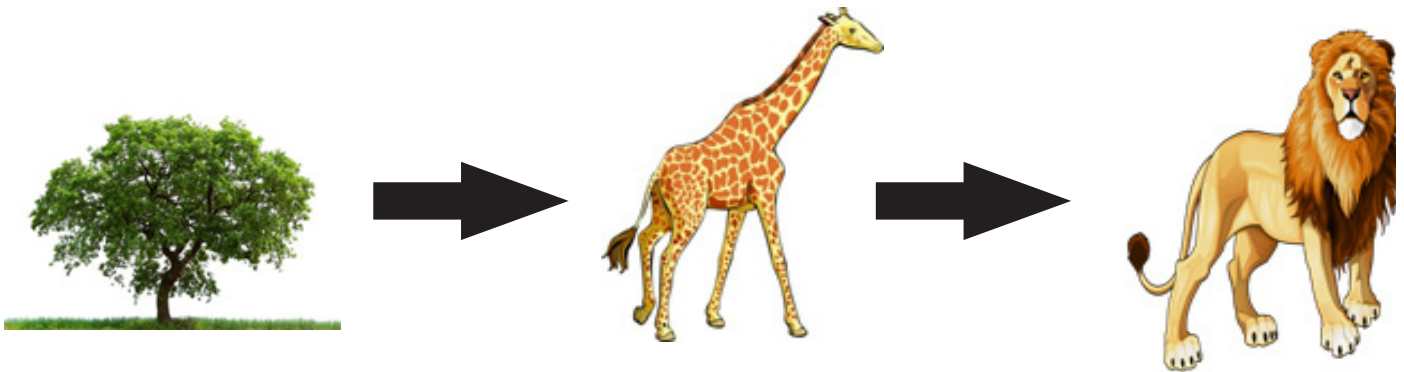
GROUP	CHARACTERISTIC FEATURE
<b>Animal</b>	<ul style="list-style-type: none"> <li>Any organisms made up of animal cells.</li> </ul>
<b>Plant</b>	<ul style="list-style-type: none"> <li>Any organisms made up of plant cells.</li> </ul>
<b>Vertebrate</b>	<ul style="list-style-type: none"> <li>Any organism with a backbone.</li> </ul>
<b>Invertebrate</b>	<ul style="list-style-type: none"> <li>Any organism without a backbone.</li> </ul>
<b>Mammal</b>	<ul style="list-style-type: none"> <li>Have hair on their bodies</li> <li>Produce milk to feed their babies</li> <li>Warm-blooded.</li> </ul>
<b>Reptile</b>	<ul style="list-style-type: none"> <li>Covered in scales</li> <li>Breathe with lungs</li> <li>Most lay eggs</li> <li>Almost all are cold-blooded.</li> </ul>
<b>Amphibian</b>	<ul style="list-style-type: none"> <li>Cold-blooded</li> <li>Spend at least part of their lives in water and on land</li> <li>Do not have scales and their skin is permeable (molecules can pass through).</li> </ul>
<b>Bird</b>	<ul style="list-style-type: none"> <li>Feathers</li> <li>Warm-blooded</li> <li>Lay eggs</li> <li>Have wings but not all birds use them to fly.</li> </ul>
<b>Fish</b>	<ul style="list-style-type: none"> <li>Live in water</li> <li>Breathe using gills.</li> <li>Almost all are cold-blooded</li> <li>Most fish have scales.</li> </ul>



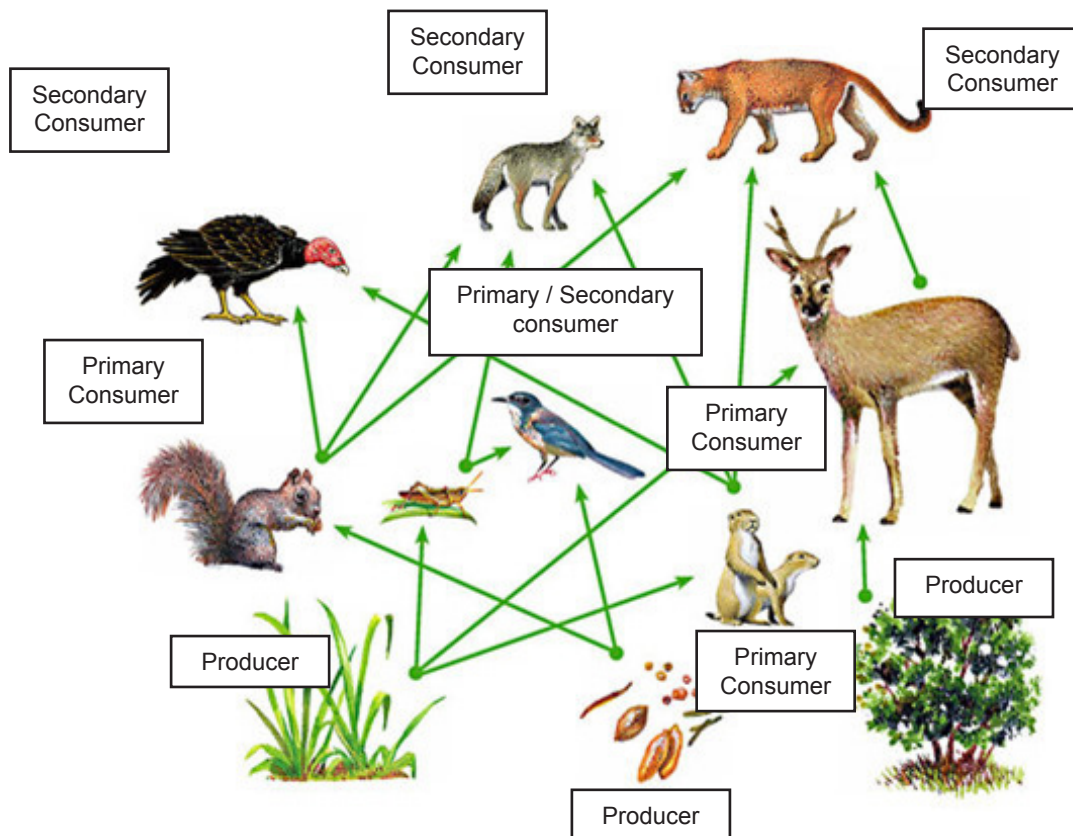
<b>Microorganism</b>	<ul style="list-style-type: none"> <li>Small, often single-celled organisms, consisting of bacteria, fungi (sometimes multicellular) and viruses.</li> </ul>
<b>Flatworm</b>	<ul style="list-style-type: none"> <li>Flatworms are non-segmented worms with a tail and a head end.</li> </ul>
<b>Annelid worm</b>	<ul style="list-style-type: none"> <li>Segmented bodies with a fluid-filled cavity.</li> </ul>
<b>Echinoderm</b>	<ul style="list-style-type: none"> <li>The body is often symmetrical. Common echinoderms are starfish.</li> </ul>
<b>Coelenterates</b>	<ul style="list-style-type: none"> <li>Coelenterates are soft-bodied organisms such as jellyfish.</li> </ul>
<b>Mollusc</b>	<ul style="list-style-type: none"> <li>Non-segmented soft body</li> <li>Presence of an internal or external shell</li> <li>Muscular.</li> </ul>
<b>Arthropod</b>	<ul style="list-style-type: none"> <li>Jointed legs.</li> </ul>
<b>Arachnid</b>	<ul style="list-style-type: none"> <li>A two part body</li> <li>Eight legs.</li> </ul>
<b>Crustacean</b>	<ul style="list-style-type: none"> <li>A hard exoskeleton made of calcium - no internal skeleton.</li> </ul>
<b>Insect</b>	<ul style="list-style-type: none"> <li>Three part body</li> <li>Six legs.</li> </ul>
<b>Myriapod</b>	<ul style="list-style-type: none"> <li>Most species have many pairs of legs</li> <li>Two body sections (head and trunk)</li> <li>One pair of antennae on the head.</li> </ul>

### FOOD CHAINS AND FOOD WEBS

A food chain shows how each living thing gets its energy. Some animals eat plants and some animals eat other animals. For example, a simple food chain links the trees & shrubs, the giraffes (that eat trees & shrubs), and the lions (that eat the giraffes). Each link in this chain is food for the next link. **The direction of the arrow shows the flow of energy.** A food chain always starts with a plant that can make its own food, and ends with an animal.



A food web is a collection of food chains which all exist within a habitat. Just like in a food chain, the arrows show the flow of energy from one organism to another.



#### Food chain

Ecosystems <http://bit.ly/2e2vsh1>. Unable to trace copyright, please contact us if you are the copyright holder.

All food webs and food chains start with a producer. A producer is a plant which makes food by photosynthesis. The original source of all energy within any ecosystem is the Sun. The first group of organisms that eat the producers are called the primary consumers. These are usually herbivores (only eat plants). The group of organisms that eat the primary consumers are usually carnivores (only eat meat) or omnivores (eat both plants and meat). These are called the secondary consumers. If there is another layer of organisms then they are the tertiary consumers.

## INTERDEPENDANCE OF ORGANISMS

All of the organisms in an ecosystem depend on each other. A slight change in the balance of an ecosystem can have detrimental consequences on other organisms. For example, in the food web over page, if squirrel numbers fell dramatically due to loss of habitat, then more of the mongoose will get eaten, lowering their numbers and having an impact on the amount of food available to the other two secondary consumers, causing their numbers to fall.

## PREDATOR-PREY RELATIONSHIPS

There is a fine balance between predator (animals which hunt) and prey (animals which get hunted). The relationship is a bit like a rollercoaster e.g. foxes prey on rabbits:

- if there are many rabbits in an area, foxes will move in
- with a lot of food available the foxes reproduce
- fox numbers then increase, more hunting takes place, and rabbit numbers fall
- now there is less food, fox numbers fall
- predation is low and the rabbits reproduce
- low fox numbers allow the rabbit numbers to grow
- now there is more food for the foxes and their numbers grow again
- this lowers the rabbit numbers
- the cycle continues until interrupted by an outside influence.

