

## **EXPLORING LIFE**

### **What are living things?**

All living things share **seven characteristics of life.**

- Living things are made up of cells.
- Organization
- Growth and development
- Reproduction
- Response to stimuli
- Maintaining internal conditions
- Using energy

You need a microscope to study cells.

**Principles of the Cell Theory:** (Put together by many scientists)

- \* All living things are made up of cells (the smallest unit of life)
- \* Cells perform different functions to keep organisms alive.
- \* All cells come from preexisting cells through the process of cell division.

### **Microscopes:**

#### **Light microscope**

Use light and lenses to enlarge an image. It can enlarge images up to 1,500 times.

#### **Electron microscopes**

Use a magnetic field to focus a beam of electrons through an object or onto an object's surface.

It can magnify an image 100,000 times or more.

There are two main type-Transmission electron microscope (TEMs) and Scanning electron microscope (SEMs)

TEMs are used to study extremely small things as cell structures.

SEMs are used to study an object's surface.

### **How many cells do things have?**

**Unicellular organisms:** Living things that are made of only one type of cell. Ex. Bacteria, paramecium, and amoeba.

**Multicellular organisms:** Living things that are made of two or more cells. Ex Animals and plants

### **Explain the characteristics of Life**

Living things:

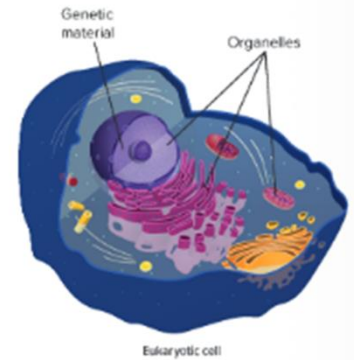
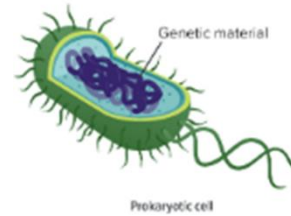
- \*Are made up of cells.
- \*Are organized according to different structures to perform different functions.
- \*Grow and develop – they grow and go through changes (develop).
- \*Create new living through the process of **reproduction**.
- \*Respond to changes in the environment called stimuli.
- \*Maintain steady internal conditions (**homeostasis**) when outside conditions change.
- \*Need energy for everything they do

## What are the different types of cells?

Cells can be divided into two categories - Prokaryotic and Eukaryotic cells.

### **Prokaryotic cells:**

The genetic material is not surrounded by a lining. They have fewer parts and are smaller than the Eukaryotic cells. Most prokaryotes are unicellular and are called prokaryotes.



### **Eukaryotic cells:**

Plants, animals, fungi, and protists are made of these cells.

Their genetic material is surrounded by a lining.

They have other structures called organelles.

They are larger than prokaryotes.

### **Classification:**







Organisms are classified (grouped) according to their cell type as well as other characteristics.

Organisms are classified into three domains-Bacteria, Archaea, or Eukarya – and then into six kingdoms.

Bacteria and Archaea are prokaryotes.

Eukarya are eukaryotes.

The classification system is still changing – it is based on the organisms cell type, habitat, the way it obtains food and energy, the structure and function of its features and its ancestry.

Domains and Kingdoms						
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 or multicellular and are more complex than bacteria and 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.

## Are viruses living things?

Most scientist agree that since viruses aren't made from cells, don't grow, use energy only from a host, and don't maintain homeostasis, they are not living things.