

## FORM 2 SCIENCE 2022

<b>STRANDS</b>	<b>SUB-STRANDS</b>
8.0: SCIENCE SKILLS	<ul style="list-style-type: none"> <li>• Laboratory Safety/ Equipment</li> <li>• Science Skills</li> </ul>
8.1: LIVING WORLD	<ul style="list-style-type: none"> <li>• Cell</li> <li>• Disease</li> <li>• Micro- organisms</li> <li>• Plant in Tonga</li> <li>• Animal in Tonga</li> <li>• Respiratory System</li> <li>• Digestive System</li> </ul>
8.2: PHYSICAL WORLD	<ul style="list-style-type: none"> <li>• Energy</li> <li>• Force</li> </ul>
8.3: MATERIAL WORLD	<ul style="list-style-type: none"> <li>• Mass</li> <li>• Volume</li> <li>• Density</li> <li>• Physical and Chemical change</li> </ul>
8.4: PLANET EARTH AND BEYOND	<ul style="list-style-type: none"> <li>• Moon</li> <li>• Tide</li> <li>• Stars</li> <li>• Soil</li> </ul>

### UNIT 8.1: LIVING WORLD

#### Major Learning outcome for UNIT 8.1:

After this UNIT students should be able to:

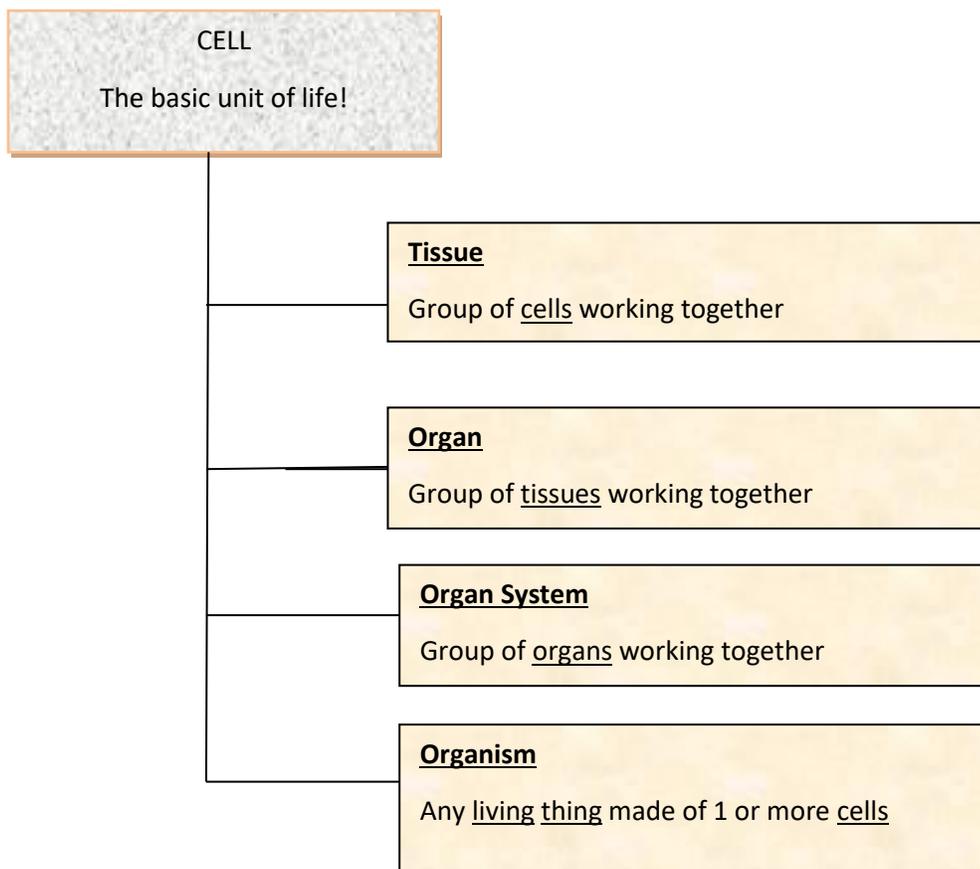
Describe some features of living things, plants and animals in Tonga, two human body systems and related health issues.

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# UNIT 8.1

## CELL

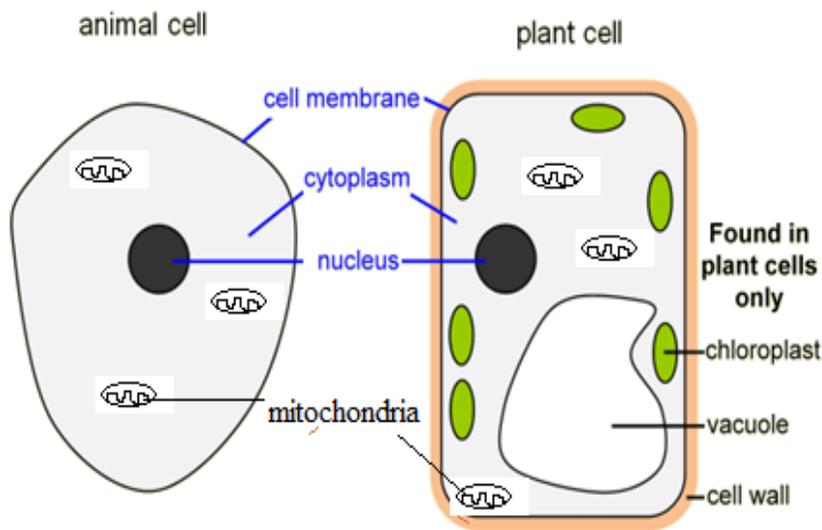
Cell is the building blocks of all living things. They are very small that we cannot be able to see them with our eyes so we need a **microscope** to study them.



Cells are studied using Electron microscope which increases the size of the studied structure by many thousand times. The structures within a cell are called **ORGANELLES**.

### I. Cell Theory:

- The **cell theory has two components** - all living things are made up of cells and all cells arise from other cells.



## Plant and Animal Cells

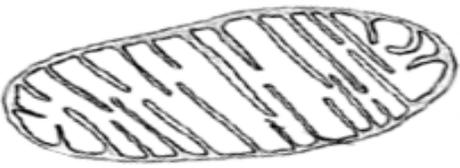
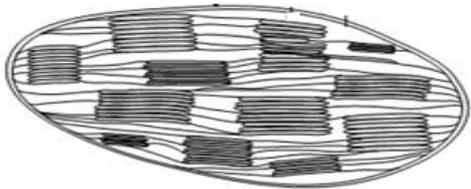
### I. Plant Cell

- plant cells have **regular shape**.
- they have **large vacuole**.
- they have a **cell wall**.
- they contain a **chloroplast**.

### II. Animal Cell

- Animal cell has an **irregular shape**
- it has **no cell wall**
- it has **no chloroplast**
- Contain **no vacuole** and if it present it is usually **small**.

### III. Cell organelles (structures inside the cell)

Part	Function	Found in
Cell membrane	Controls movement of materials in and out of the cell.	Plant and animal cells
Cytoplasm	Jelly-like substance, where chemical reactions happen.	Plant and animal cells
Nucleus	Controls what happens inside the cell. Carries genetic information (DNA). In exams <b>don't</b> call the nucleus the 'brain' of the cell. That is not a good description and will not get you marks.	Plant and animal cells
Mitochondria 	The 'powerhouse' of the cell. This is the organelle where respiration takes place, i.e produce energy (ATP).	Plant and animal cells
Chloroplast 	Where photosynthesis happens - chloroplasts contain a green <b>PIGMENT</b> called chlorophyll which traps light energy from the sun for the process of photosynthesis.	Plant cells only
Vacuole	Contains a liquid called cell sap, which keeps the cells firm. It stores food, water, metabolic and toxic waste.	Large organelle in plants but usually small if present in animal cell.
Cell wall	Made of a tough substance called <b>cellulose</b> , which supports the cell.	Plant cells only

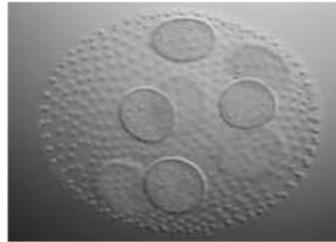
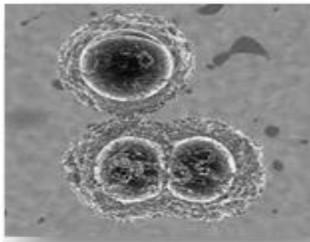
<b>Unicellular</b>	Organism containing only one cell
<b>Multi-cellular</b>	Organism containing many cells.
<b>Microorganisms (microbes)</b>	Any organisms which can be seen with the aid of a microscope.

## THE FIVE KINGDOMS

Living organisms are divided into 5 kingdoms

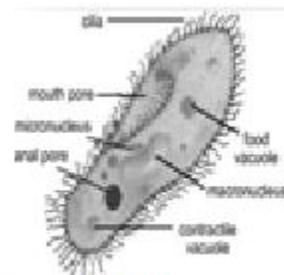
### 1. Monera

- No nucleus
- Unicellular
- Classified into autotrophs (organisms that can manufacture their own food) and heterotrophs (are consumers that depend on other organisms for food).
- Eg bacteria, blue green algae.

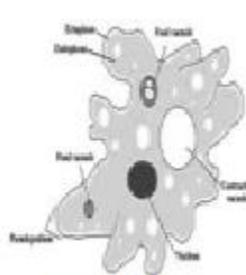


### 2. Protista

- Have a nucleus
- Unicellular



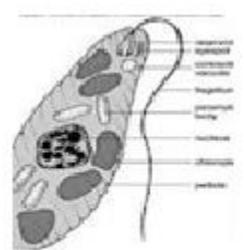
paramecium



amoeba



protist



euglena

### 3. Fungi

- Cannot make their own food



breadmould



toadstool



mushroom

- Eg,

#### 4. Plantae

- Can make their own food
- Multicellular
- Eg, all plants

#### 5. Animalia

- They are multicellular
- Are classified into 2 main groups, vertebrates and invertebrates.

### DISEASE

- A disease is any condition that seriously impairs the functioning of that organism.
- Diseases are caused by **lifestyles diseases**, **hereditary**, **microorganisms** (bacteria, virus and fungi) and **parasites** (tapeworms in stomach, mosquitoes, and hookworms).

There are two types of diseases:

1. **Communicable diseases** (Infectious): disease that can be able to pass from one person to another.

- Flu, Typhoid, Measles, Aids etc

2. **Non-communicable diseases** (Non-infectious) :

- Paralysis, Obesity, Diarrhea, Diabetes, High Blood Pressure, Cancers

#### Examples of Diseases

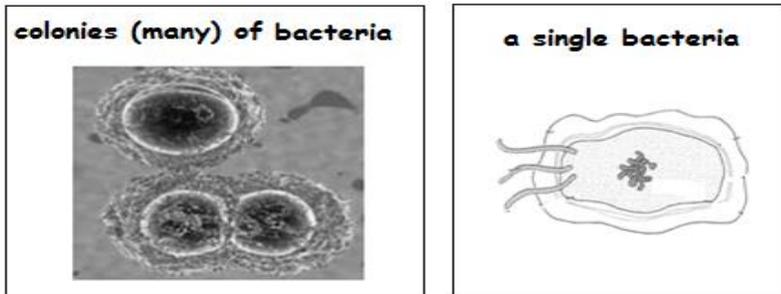
Diseases	Ways to prevent	Treatment
Aids	<ul style="list-style-type: none"> <li>• Be faithful to one partner/ Use condoms/ Check blood (donor)/ use injecting needle only once</li> </ul>	
Tuberculosis	<ul style="list-style-type: none"> <li>• Hygiene/ Vaccination/ Drink only clean water/ Cover mouth when coughing</li> </ul>	<ul style="list-style-type: none"> <li>• Antibiotics</li> </ul>
Typhoid	<ul style="list-style-type: none"> <li>• Hygiene/ Wash hands with soap after using toilets</li> </ul>	
Dengue fever	<ul style="list-style-type: none"> <li>• Destroy birth place of mosquitoes</li> </ul>	
Tetanus (kona hamu)	<ul style="list-style-type: none"> <li>• Vaccination</li> </ul>	<ul style="list-style-type: none"> <li>• Antibiotics/ Tetanus Injection</li> </ul>
Poliomyelitis	<ul style="list-style-type: none"> <li>• Vaccination</li> </ul>	
Hepatitis (A,B,C,D)	<ul style="list-style-type: none"> <li>• Vaccination</li> </ul>	
Ringworm/tinea	<ul style="list-style-type: none"> <li>• hygiene</li> </ul>	<ul style="list-style-type: none"> <li>• Treat with anti-fungal medicine</li> </ul>
Mumps		<ul style="list-style-type: none"> <li>• Antibiotics</li> </ul>
Malaria	<ul style="list-style-type: none"> <li>• Mosquito nets- avoid being bitten</li> <li>• Early diagnose</li> </ul>	

## MICROORGANISMS (MICROBES)

There are 3 types of micro-organisms

**Bacteria, Virus, Fungi**

### 1. Bacteria



There are good bacteria and also bad or harmful bacteria

#### Good bacteria

- Decomposers or those who break down dead bodies of plants and animals
- Those that help make food such as cheese and yoghurt
- Bacteria that live in our stomach which help with the process of digestion
- Bacteria that live in the root of legumes which make the soil more fertile (they fix the Nitrogen gas from the atmosphere and change it into a form where plants can use)

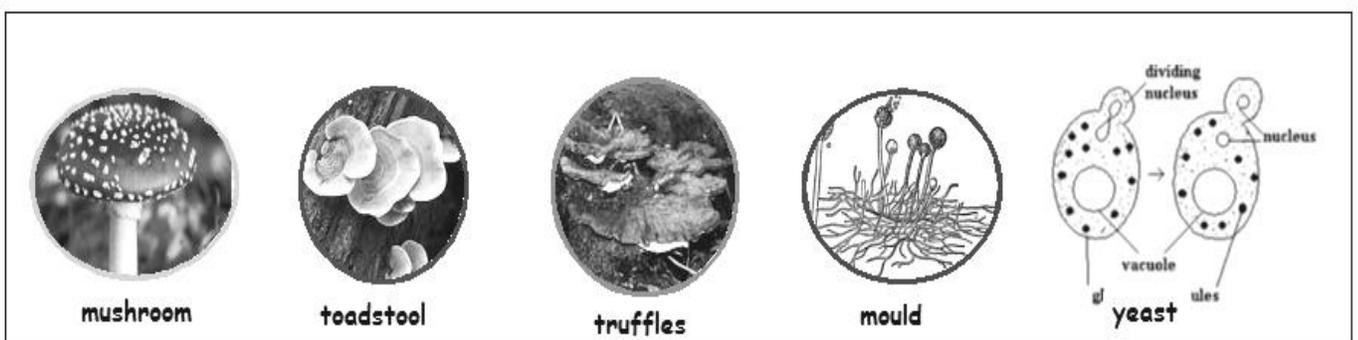
#### Harmful bacteria

- The disease causing bacteria.
- Bacteria cause diseases such as pneumonia, sore throat, blood poisoning, typhoid
- Diseases caused by bacteria can be prevented by be hygienic and are usually treated with antibiotics

### 2. Fungi

Singular: fungus/ Plural: fungi

There are many examples of fungi shown below:



There are good fungi and also harmful fungi.

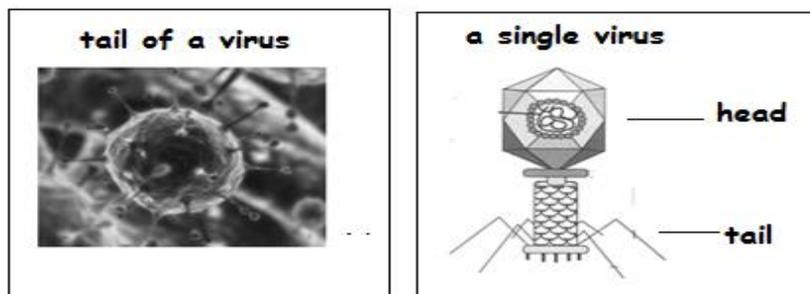
### Good fungi

- The decomposer or the fungi that break down dead bodies of plants and animals
- They help produce medicine such as penicillin
- We can use mushroom (a type of fungi) for food
- Yeast (a type of fungi) can help raise bread and cakes.
- Yeast can also help in alcohol production.

### Harmful fungi

- The fungi that cause disease.
- Most of the skin diseases are caused by fungus such as athlete's foot, tinea and thrush.
- Diseases caused by fungus are usually treated by anti-fungal medicine.

### 3. Virus



- There is no friendly virus like the bacteria and the fungi.
- All virus causes disease.
- Diseases caused by virus are hard to cure because they can change form and they do not have the characteristic of living organism. All they do is reproducing (multiplying) using living cells.
- Examples of diseases caused by virus are HIV-causes AIDS (Acquired Immunity Deficiency Syndrome), Common cold and SARS (Severe Acute Respiratory Syndrome), measles, influenza (flu), chicken pox.

## ACTIVITY

1. Define the following terms:

a) Cell

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b) Unicellular

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c) Multi-cellular

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d) Micro-organisms

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2) State ONE components of Cell theory

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3) Match the description of each organelles with its name

Column A	Column B
1. The powerhouse of the cell _____	A. Nucleus
2. The protective layer that covers the cell's surface _____	B. Chloroplast
3. Found only in Plant cells _____	C. Mitochondria
4. Directs the activity in the cell _____	D. Cell membrane

4) All living things are made up of cells and all cells arise from other cells. Draw the cell theory called "**ANIMAL CELL**"



5) List the FIVE (5) kingdoms of living organism

i.

ii.

iii.

iv.

v.

6) Identify the two types of the word "DISEASE"?

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7) Under the heading below, list **TWO diseases** that caused by each harmful organisms.

Caused by <b>BACTERIA</b>	Caused by <b>FUNGUS</b>	Caused by <b>VIRUS</b>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>