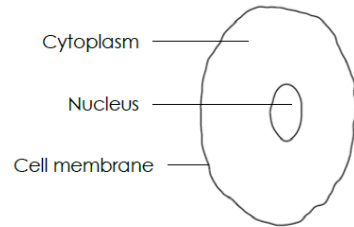


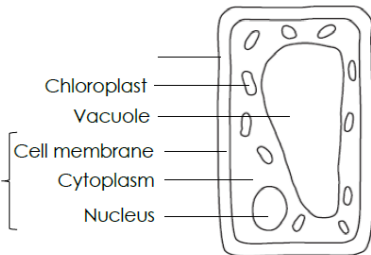
Cells

- Living things are called organisms and carry out the 8 life processes: movement, respiration, sensitivity, growth, reproduction, excretion and nutrition
- All living things are made of cells
- Unicellular** organisms are made of only one cell e.g. bacteria
- Multicellular** organisms are made of many cells e.g. humans
- Animal and plant cells contain a nucleus, cell membrane and cytoplasm



- Only plant cells contain a cell wall, vacuole and chloroplasts

Found in both animal and plant cells



- The nucleus controls the cell's activities because it contains DNA
- The cell membrane controls what enters and leaves the cell
- The cytoplasm is a jelly-like substance where reactions happen
- The cell wall surrounds plant cells and provides strength and support
- The chloroplasts are where photosynthesis take place to make food (glucose) for the plant and contain chlorophyll to absorb sunlight
- The vacuole contains liquid that stores substances for the cell and keep it rigid

Specialised cells

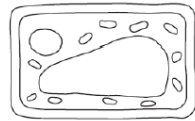
- Specialised cells have different structures that let them carry out their function
- Sperm cells.** Function = swim to the egg cell for fertilisation. Structure = tails for swimming



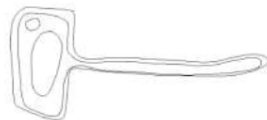
- Neurons (nerve cells).** Function = send messages to control the body. Structure = long axon and connections at the ends



- Leaf cells.** Function = take in lots of sunlight (for photosynthesis to make food). Structure = lots of chloroplasts

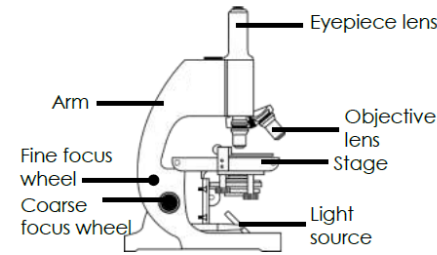


- Root hair cells.** Function = need to take in lots of water. Structure = large surface area to take water in



Microscopes

- A microscope is used to make something small appear much larger
- The parts of a microscope are: eye piece lens, stage, objective lenses, handle, light/mirror, coarse focusing knob, fine focusing knob



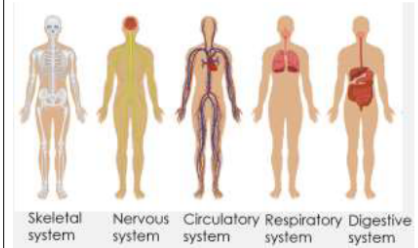
- Magnification = eyepiece magnification x objective lens magnification

21. Method

- Place the specimen under the clips on the stage
- Move the objective lenses so that the lowest magnification is facing the specimen
- Move the stage up towards objective lens using the coarse focus wheel ensuring that it does not touch it
- Place your hand on coarse focus wheel and look through the eyepiece lens
- Move the coarse focus wheel slowly away from you so that the stage moves down
- When the image becomes clearer, use the fine focus wheel instead and focus the image to make it clear

Cell organisation

- A group of the same cells working together is called a tissue
- A group of tissues working together for the same function is called an organ
- A group of organs working together for the same function is called an organ system
- There are many organ systems in the human body including: respiratory, excretory, nervous, muscular, circulatory, skeletal and digestive



- Multicellular organisms require organ systems to carry out life processes

The Three States of Matter

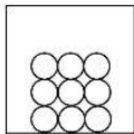
- The three states of matter are **solids, liquids and gases**
- Solids, liquids and gases have different physical properties:

Property	Solid	Liquid	Gas
Does the object flow?	No	Yes	Yes
Can the object be compressed?	No	No	Yes
Does the object fill to fit the container?	No	No	Yes
Does the object have a fixed shape?	Yes	No	No
Does the object have a fixed volume?	Yes	Yes	No

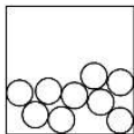
The Particle Model

- All matter is made from tiny particles
- The arrangement of particles affects the properties of the substance
- The three states of matter can be represented by a simple model, in which the particles are represented by small circles

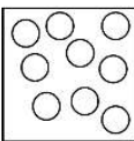
- Particles in a **solid** are arranged in a regular pattern, touch each other and vibrate on the spot



- Particles in a **liquid** are arranged randomly, are touching and move freely



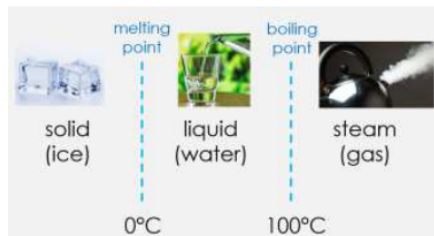
- Particles in a **gas** are arranged randomly, do not touch and move freely



- Gas pressure** happens because of particles colliding with the walls of a container

Changing State

- A substance **melts** when it changes from a solid to a liquid
- A substance **freezes** when it changes from a liquid to a solid
- Melting and freezing of a substance happens at a certain temperature called the **melting point**
- A substance **boils** when it changes from a liquid to a gas
- A substance **condenses** when it changes from a gas to a liquid
- Boiling and condensing take place at the **boiling point**



- The amount of **energy needed to change state** from solid to liquid and from liquid to gas **depends on the strength of the forces** between the particles of the substance
- The **stronger the forces** between the particles **the higher the melting point and boiling point** of the substance
- The **particles in a solid can vibrate in a fixed position** and cannot move from place to place because there are strong forces, which attract the particles towards each other
- The **particles in a liquid** are able to **move around each other** because the bonds are strong enough to keep the particles close together, but weak enough to let them move around each other

Diffusion

20. Diffusion is the movement of particles from a high concentration to a low concentration.



The particles of red gas diffuse over 2 minutes. The particles of the red gas move from a higher concentration to where the concentration is lower.

- Diffusion happens in liquids and gases** because particles are free to move
- Diffusion cannot happen in solids** because particles in a solid are not free to move
- Diffusion happens faster** when the particles in a liquid or gas are moving **faster after heating**

Variables

- The **independent variable (IV)** is the variable you **change** (the variable you want to investigate)
- The **dependent variable (DV)** is the variable you **measure** because it depends on the IV
- The **control variables (CV)** are the variables you **keep the same** because they could affect the dependent variable