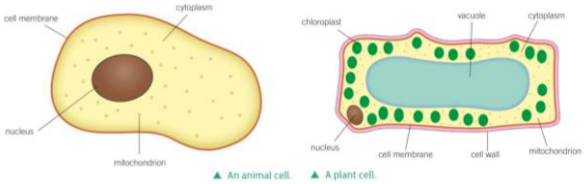
Module _1_ : / Topic: Biology

Week 1 / Lesson 1 - Plant and Animal Cells



▲ An animal cell. ▲ A plant cell.

Cell Structure	Function	Animal Cells	Plant Cells
Nucleus	Contains **genetic information** that **controls** the function of the cell.	**y**	**y**
Cell Membrane	A barrier that controls what **enters** and **leaves** the cell.	**y**	**y**
Cytoplasm	Where many **cell activities** and **chemical reactions** within the cell occur.	**y**	**y**
Mitochondria	Produces **energy** from **aerobic respiration.**	**y**	**y**
Chloroplast	Where **photosynthesis** takes place		**y**
Vacuole	Used to **store** water and other chemicals as **cell sap**. Keeps the cell firm.		**y**
Cell Wall	**Strengthens** and **supports** the cell. (made of **cellulose** in plants).		**y**

Week 2 / Lesson 5 - Cells, tissues, organs & organ systems

This hierarchy works for plants and animals

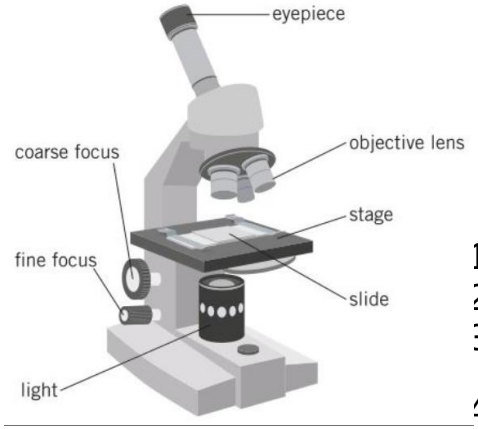
Multicellular - made of many cells
Tissue - A group of similar cells, working together, to perform a function.
Organ - A group of different tissues, working together, to perform a function.
Organ System - A group of different organs, working together, to perform a function.

Week 1 / Lesson 2 - Specialised Cells

Specialised cells have a certain shape and structure so that they are suited to carry out a particular function.

Specialised Cell	How structure relates to function
Sperm cell	**Streamlined** head and long tail. Contains lots of **mitochondria** to transfer energy.
Nerve cell	**Long** and thin. **Transmits electrical impulses** over a distance.
Red blood cell	Contains **haemoglobin** to transport oxygen. Disklike shape to **increase surface area**.
Root hair cell	Long extension to **increase surface area** for water uptake by osmosis; **thin cell wall**.
Leaf cell	Found at the top of the leaf and are packed with **chloroplasts** to maximise **photosynthesis.**

Week 1 / Lesson 3 - The Microscope



All living organisms are made up of cells. Cells were first seen using a microscope.

- This magnifies a small object.

Total Magnification = eyepiece lens magnification x objective lens magnification

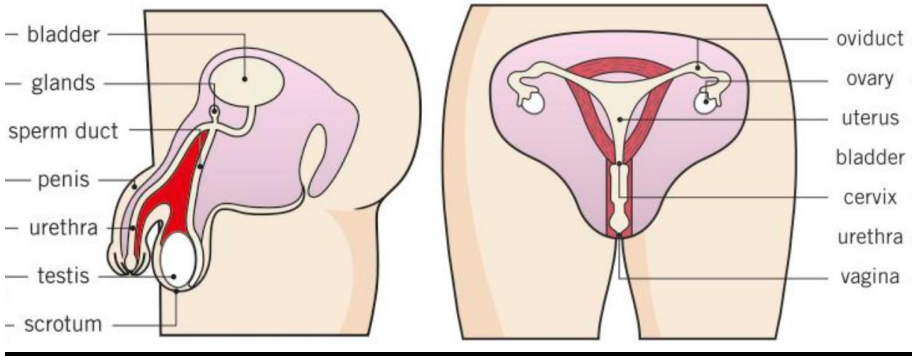
Using a microscope:

1. Move the stage to it's lowest position
2. Place object on stage
3. Select objective lens with lowest magnification.
4. Use the eyepiece lens and coarse

Week 2 / Lesson 4 - Unicellular Organisms and Diffusion

Unicellular	An organism made of just **one cell.**
Amoeba	A **unicellular organisms** found in water that feeds on other organisms.
Euglena	A **unicellular organism** found in water that has **chloroplasts** for **photosynthesis.**
Flagellum	Tail-like structure that spins like a propeller.
Binary Fission	Method of **reproduction** for amoeba and euglena. One cell splits into **two identical cells.**
Diffusion	The movement of particles from an area of **high concentration** to an area of **low concentration.**
Concentration	A measure of the **number of particles** of a substance in a **fixed volume.**

Week 3 / Lesson 7 - Reproductive systems



Week 4 / Lesson 10 - Asexual Reproduction

This is reproduction without sex.

Binary fission - Splitting into 2 identical cells

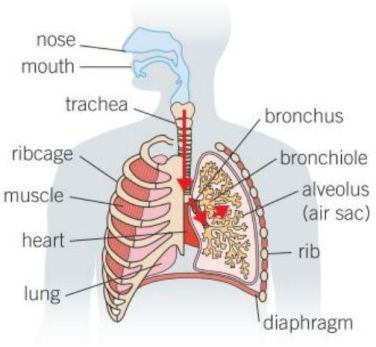
Budding - Forming a small new organism on the side of an adult

focus knob to see the object.

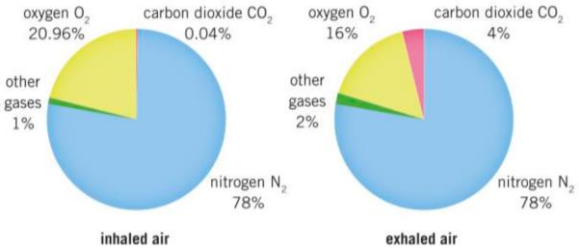
5. Turn the fine-focus knob until object is in focus.

Week 2 / Lesson 6 - Breathing and gas exchange

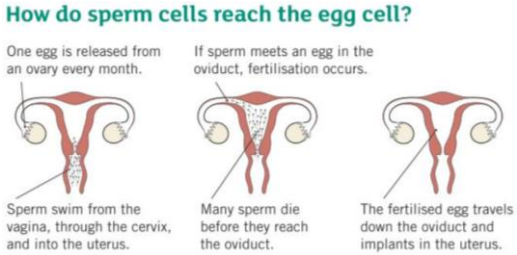
Gas Exchange - the transfer of gases between and organism and its environment



Breath in air through mouth and nose, down the trachea, into the bronchi and then bronchioles. Finally it moves into the alveoli, sac where gas exchange between the blood and air occurs. Breathing out is the reverse.



Week 3 / Lesson 8 - Fertilisation & implantation



Gametes - reproductive cells (egg and sperm, ovule and pollen).

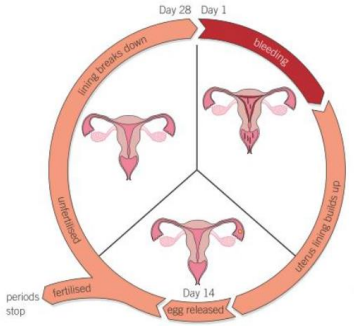
Fertilisation - nuclei of egg and sperm fuse.

Embryo - fertilised egg that has started to divide.

Implantation - embryo attaching to the lining of the uterus

Week 3 / Lesson 9 - Reproductive systems

Vegitative propagation - A part of an organism growing into a whole new organism.
Parthenogenesis - Animal giving birth to live organisms
Spores - Organism producing a cell that can grow into a new individual



Period - loss of uterus lining
Menstrual cycle - 28 day, hormone controlled, cycle of the female reproductive system.
Ovulation - The release of an egg from an ovary.
Contraception - a method of avoiding pregnancy.
Condom - A barrier method of contraception.
Contraceptive pill - Hormonal contraception.