

**Bacterial Diseases**

**Salmonella** bacteria causes food poisoning. Symptoms include fever, stomach cramps, vomiting, and diarrhoea. Wash hands and avoid contaminated food.

**Gonorrhoea** is a sexually transmitted disease passed on by sexual contact. Symptoms include pain when urinating and thick yellow/green discharge from the vagina or penis. To prevent the spread people should be treated with antibiotics and use a condom

**Viral Diseases**

**Measles** is spread by droplets of liquid from sneezes and coughs. Symptoms include a red rash on the skin and a fever. Measles can be fatal.

**HIV** is spread by sexual contact or exchanging body fluids. HIV can be controlled by antiviral drugs which stops the virus replicating. The virus attacks cells in the immune system. If the immune system is badly damaged the body cannot cope with other infections. This is the late stage and is called AIDS.

**Tobacco mosaic virus** affects plants. Parts of the leaves become discoloured which means that plant cannot carry out photosynthesis and therefore cannot grow.

**Respiration**

Respiration is the chemical reaction which occurs inside the mitochondria in all living cells to release energy for living function and processes. The reaction is exothermic meaning that energy is released to the surroundings. Aerobic respiration:

Glucose + oxygen -> carbon dioxide + water

In anaerobic respiration the glucose is not completed oxidised as there is not enough oxygen so less energy is released:

Glucose -> lactic acid

In plants and yeast, anaerobic respiration is called fermentations and is used in bread making and beer brewing:

Glucose -> ethanol + carbon dioxide

**How pathogens are spread**

Pathogens can be spread by:

Water – drinking dirty water

Air – breathed in

Direct contact – touching contaminated surfaces including the skin

**Preventing the spread of disease**

Ways to reduce the spread of diseases include; being hygienic, destroying vectors, isolation, and vaccination.

**Digestive system**

The purpose of the digestive system is to break down large molecules into smaller soluble molecules so that they can be absorbed into the blood. The rate of these reactions is increased by enzymes which are biological catalysts.

**Principles of Organisation**

Cells are the basic building blocks of all living things. A group of cells with a similar structure and function is called a tissue. An organ is a combination of tissues carrying out a specific function. Organs work together in an organ system. Organ systems work together to form whole organisms.

**Sub-Cellular Structures**

Nucleus – controls the cell, contains DNA

Mitochondria – where respiration occurs

Chloroplasts – where photosynthesis occurs

Cell wall – supports the cell

Cell membrane – lets things in and out of the cell

Cytoplasm – where chemical reactions occur

Vacuole – contains cell sap

**Animal and Plant Cells**

Animal and plant cells are both eukaryotic and have some organelles that are the same however plant cells have three organelles that are different.

**Prokaryotic and Eukaryotic Cells**

**Prokaryotic** – older, simpler cells. Do not have a nucleus or any membrane bound organelles. Often have flagella for movement. Examples: bacterial cells.

**Eukaryotic** – newer, more complex cells. Have a nucleus and membrane bound organelles. Examples: animal and plant cells.

**Microscopes**

There are two main types of microscopes: light microscopes and electron microscopes. Light microscopes are cheaper but their magnification and resolution are not as high. Electron microscopes are more expensive and their magnification and resolution are much higher.

To set up a microscope; place the slide onto the stage and secure with the clips. Put the lowest objective lens over the slide and look through the eyepiece. Adjust the coarse focus and then the fine focus to bring the image into focus.

$$magnification=\frac{image size}{real size}$$

**Exchanging Substances**

**Diffusion**

Substances moves from an area of high concentration to an area of low concentration (down a concentration gradient). Occurs in the alveoli in the lungs diffusing oxygen into the blood and carbon dioxide out of the blood. This exchange also occurs in plant leaves. Also occurs in the villi in the small intestine diffusing food molecules into the bloodstream.

**Osmosis**

The movement of water from a high concentration to a low concentration. Occurs in the root hair cells of plants.

**Active Transport**

The movement of mineral ions from an area of low concentration to an area of high concentration. Requires energy. Occurs in the root hair cells of plants.

**Cells**

Cells are the building blocks of living organisms. There are lots of different types of cells and the two main types of cells are prokaryotic and eukaryotic cells.

**Year 9 Fundamentals: The Body**

**Ambitious Vocabulary**

Organelle Mitochondria Osmosis

**Science**