

# Definitions and Concepts for WJEC (Eduqas) Biology GCSE

## Topic 1: Cell Biology

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Definitions in **bold** are for higher tier only

Definitions marked by '\*' are for separate sciences only

**Active site** - The part of the enzyme which is specific to the substrate and has a complementary shape to it.

**Adult stem cell** - A stem cell found in the bone marrow that can differentiate into many types of cells.

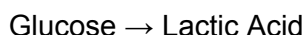
**Aerobic respiration** - A form of respiration that uses a plentiful supply of oxygen to release energy from glucose. It is shown by the following equation:



**Amino acids** - Small molecules that make up a protein.

**Amylase** - An enzyme that breaks down carbohydrates into simple sugars. It is produced in the pancreas and salivary glands.

**Anaerobic respiration** - A form of respiration that releases energy from glucose when there is an oxygen debt. Anaerobic respiration in animals is shown by the following equation:



**Benedict's test** - A test for reducing sugar.

**Benedict's reagent** - A reagent used to test for reducing sugars that produces a different colour (from a blue solution to a brick red precipitate) based on the amount of reducing sugar present.

**Biuret test** - A test used to check the presence of peptide bonds. If peptide bonds are present there will be a colour change from blue to violet.

**Cancer** - A result of changes in cells that lead to uncontrolled growth and division †

**Carbohydrases** - An type of enzyme that breaks down carbohydrates into simple sugars.

**Carbohydrate** - A large molecule that is synthesised from simple sugars.

**Cell cycle** - A series of events that take place in a cell in preparation for cell division.

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**Cell differentiation** - The production of specialised cells for greater efficiency. †

**Cell membrane** - A selectively permeable barrier which controls the movement of substances into and out of the cell. It also has receptor molecules on the surface for cell-to-cell signalling.

**Cell wall** - An outer layer made of cellulose fibres in plant cells. It provides the plant cell with strength and support.

**Cellular respiration** - An exothermic reaction which is continuously occurring in all living cells, enabling cells to carry out cell processes. †

**Chloroplasts** - The organelles that are the site of photosynthesis. They contain chlorophyll (a green pigment) which absorbs light energy and important enzymes which are needed for photosynthesis.

**Chromosome** - A long, coiled molecule of DNA that carries genetic information in the form of genes.

**Cover slip** - A small piece of glass placed on top of the specimen to protect it from the lens.

**Cytokinesis** - The third stage of the cell cycle in which two identical diploid daughter cells are formed.

**Cytoplasm** - Contains dissolved nutrients, salts and the organelles. It is also the site of many chemical reactions.

**Denaturation** - The permanent change in the shape of an enzyme's active site that stops the enzyme functioning normally.

**Digestion** - The process of breaking down biological molecules from food so that they can be absorbed into the body.

**DNA (Deoxyribonucleic acid)** - A polymer which is made of two strands twisted around each other forming a double helix. It contains all the genetic information.

**Diploid** - An organism or cell that has the full number of paired chromosomes.

**Electron microscope** - A microscope that uses electrons to produce an image of a specimen.

**Embryo** - An organism in its early stages of development.

**Embryonic stem cell** - A type of stem cell found in very early embryos that can differentiate into any cell type.

**Enzymes** - Biological catalysts that increase the rate of chemical reactions.

**Enzyme specificity** - Enzymes will only act on specific substrates that have a complementary shape to the active site of the enzyme.



**Eukaryotic cell** - A type of cell found in plants and animals that has a nucleus and other membrane-bound organelles.

**Exothermic reaction** - A reaction that releases energy, usually in the form of light or heat.

**Eyepiece lens** - The lens that further magnifies the image produced by the objective lens.

**Fatty acid** - A carboxylic acid that has a long carbon chain. Fatty acids react with glycerol to make lipids.

**Fertilisation** - The fusion of the male and female gametes, restoring the full chromosome number.

**Genetic material** - The material that stores the genetic information.

**Gamete** - Sex cells (sperm and egg cells) with half the usual number of chromosomes. They are involved in reproduction.

**Haploid** - An organism or cell that has half the usual number of chromosomes (a set of unpaired chromosomes).

**Iodine solution** - A solution used to test for the presence of starch. A colour change from brown to blue-black indicates a positive result.

**Laser imaging microscope** - A microscope that uses a laser beam to illuminate a single point of the sample. The emitted photons are then detected.

**Light microscope** - A microscope that used light to produce an image of a specimen.

**Limiting factor** - A factor that when in short or inadequate supply limits the rate of a reaction.

**Lipase** - An enzyme that breaks down lipids into fatty acids and glycerol.

**Lipid** - A large molecule that is synthesised from three fatty acids and a glycerol molecule.

**Lock and key hypothesis** - A theory that describes how substrates must be the correct shape to fit the active site of an enzyme.

**Magnification** - How many times larger the image appears relative to the original object.

$$\text{Magnification} = \text{image size} / \text{actual size}$$

**Meiosis** - A type of cell division which halves the chromosome number to form gametes; each meiotic division produces four cells that are genetically different because genes separate and are reshuffled during the process of gamete formation. ✚

**Meristematic cell** - A type of cell that can differentiate into any plant cell type.

**Meristem tissue** - A plant tissue that contains many undifferentiated cells.



**Mitochondria** - The organelle which is the site of aerobic respiration. It contains enzymes required for cellular respiration.

**Mitosis** - A type of cell division that produces two identical diploid daughter cells (i.e. contain a full set of chromosomes) from one parent cell. It is the second stage of the cell cycle and enables organisms to grow, replace worn out cells and repair damaged tissues. ➦

**Monomer** - A small molecule which can be combined with other identical monomers by chemical bonds, forming a large polymer.

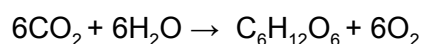
**Mutation** - A random change in DNA which increases variation. They may have a neutral, beneficial or damaging effect on the phenotype.

**Nucleotide** - The monomers of DNA that consist of a common sugar, a phosphate group and a base attached to the sugar. The chemical base can be one of A, C, T or G.

**Nucleus** - An organelle found in most eukaryotic cells that contains the cell's genetic material and controls the activities of the cell.

**Objective lens** - The lens found closest to the specimen that magnifies the image.

**Photosynthesis** - An endothermic reaction that takes place in the chloroplasts, converting carbon dioxide and water into glucose and oxygen using light energy. It is a two stage process.



Sunlight energy

**Plasmid** - A circular loop of double-stranded DNA that is found in the cytoplasm of prokaryotic cells. It is free to move unlike chromosomal DNA.

**Polymer** - Many small molecules (monomers) chemically joined together to make 1 large molecule. Examples include starch, proteins and DNA.

**Prokaryotic cell** - A unicellular organism that lacks a nucleus and other membrane-bound organelles e.g. bacteria.

**Proteases** - A type of enzyme that breaks down proteins into amino acids.

**Protein** - A large molecule synthesised from amino acid monomers.

**Protein synthesis** - The formation of proteins from amino acids which takes place in the ribosomes.

**Resolution** - The ability to see two objects as two separate entities (measured in dpi).

**Ribosomes** - Organelles which are the site of protein synthesis.

**Scanning electron microscope (SEM)** - A microscope that uses reflected electrons to produce an image of a specimen. It creates a 3D image with a lower resolution.



