Definitions and Concepts for Edexcel Biology GCSE

Topic 2: Cells and Control

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

Definitions marked by '' are for separate sciences only*

Adult stem cells - Stem cells that can differentiate into a limited range of cell types, e.g. bone marrow stem cells.

Anaphase - The third stage of mitosis in which the chromatids are pulled to opposite poles of the cell by spindle fibres.

Asexual reproduction - A form of reproduction involving a single parent that creates genetically identical offspring.

Axon - A long fibre that conducts nerve impulses away from the cell body.

Cancer - A non-communicable disease caused by changes in the cell that lead to uncontrolled growth and division.

***Cataract** - A cloudy patch which forms on the lens of the eye and prevents light from entering normally. Affected individuals have blurred vision, difficulty seeing the intensity of colours and problems with glare. It is treated using surgery to exchange the clouded lens for a synthetic one.

Cell cycle - A series of events that take place in a cell, involving cell growth, DNA replication and cell division.

Cell differentiation - The process by which an undifferentiated cell becomes specialised for its function.

Cell elongation - The process by which cells expand and enlarge, enabling the growth of a plant.

Central nervous system (CNS) - The brain and spinal cord.

***Cerebellum** - The region of the brain that controls muscle coordination and non-voluntary movement (e.g. balance, posture).

***Cerebral hemisphere** - One half of the cerebrum. The left hemisphere controls muscles on the right side of the body and vice versa.

***Cerebrum** - The largest region of the brain consisting of two hemispheres. It is responsible for movement, memory, intelligence, language and vision.

Chromatid - One 'arm' of a replicated chromosome.

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

***Colour blindness** - A deficiency of the eye that makes it difficult to distinguish between colours.

***Cone cells** - Cells found in the retina that are sensitive to high light intensity (bright light) and which detect different colours.

***Cornea** - The transparent outer covering that reflects light entering the eye.

***CT scan - An imaging technique that uses X-rays to create detailed images of internal organs.**

Cytokinesis - The division of the cytoplasm at the end of mitosis to produce two new daughter cells.

Dendrites - Short, branched extensions of dendrons that provide a large surface area to receive nerve impulses from other neurones.

Dendron - Branched extensions of a nerve cell body that connect to other neurones and carry impulses towards the body.

Diploid cell - A cell that contains two copies of each chromosome (i.e. a full set of chromosomes).

Effector - An organ, tissue, or cell that produces a response to a stimulus.

Embryonic stem cells - Stem cells found in very early embryos that are unspecialised and capable of differentiating into any cell type.

Eye - A sense organ containing receptors sensitive to light intensity and colour.

Growth - An increase in mass or size.

Haploid cell - A cell that contains a single copy of each chromosome (i.e. half the number of chromosomes).

Interphase - The longest stage of the cell cycle that involves cell growth, the synthesis of new organelles and DNA replication.

***Iris** - A pigmented ring of muscles that controls the size of the pupil to alter how much light enters the eye.

***Lens** - A transparent, biconvex structure that refracts light, focusing it onto the retina.

***Long-sightedness** - A defect of the eye where nearby objects appear out of focus due to the convergence of light rays behind the retina. This occurs when the eyeball is too short or the lens is less elastic. It is corrected using a convex lens.

***Medulla oblongata** - The region of the brain that regulates unconscious activities such as breathing and heart rate.

Meristem tissue - Plant tissues containing undifferentiated stem cells.

Metaphase - The second stage of mitosis in which the chromosomes align at the cell equator.

Mitosis - A form of cell division that produces two genetically identical daughter cells (with a full set of chromosomes) from one parent cell.

Motor neurone - A neurone that carries nerve impulses from the central nervous system to the effectors.

Myelin sheath - An electrically insulating layer that surrounds the axon and increases the speed of nerve impulses.

Neurones - Nerve cells adapted to quickly transmit nerve impulses. They are the functional units of the nervous system.

Neurotransmitters - Chemicals that are used for communication between neurones and their target cells.

Percentile chart - A chart used to monitor growth or time. Measurements (e.g. fetal length or head circumference) can be compared to the expected values at a certain age enabling the identification of abnormal patterns in development.

***PET scan - An imaging technique used to assess the structure and function of the brain through the use of radioactive chemicals. Comparisons to a normal brain can highlight unusually active or inactive areas.**

Prophase - The first stage of mitosis in which the chromosomes condense and the nuclear membrane breaks down.

***Pupil** - A hole in the centre of the iris that allows light rays to enter the eye.

Reflex - A rapid and automatic response to a stimulus by the body.

Reflex arc - The pathway of neurones involved in a reflex action:

stimulus → sensory receptor → sensory neurone → relay neurone → motor neurone → effector → response

Relay neurone - A neurone that carries nerve impulses from sensory neurones to motor neurones within the central nervous system.

***Retina** - A light sensitive layer at the back of the eye composed of rod and cone cells. It converts light energy into neural signals which are sent to the brain

***Rod cells** - Cells found in the retina that are sensitive to low light intensity (dim light).

Sensory neurone - A neurone that carries nerve impulses from the receptors to the central nervous system.

Sensory receptor - A specialised structure that detects a specific type of stimulus.

***Short-sightedness** - A defect of the eye where distant objects appear out of focus due to the convergence of light rays in front of the retina. This occurs when the eyeball is too long or the lens is too thick and too rounded. It is corrected using a concave lens.

Stem cells - Cells that are unspecialised and capable of differentiating into a range of different cell types.

Synapse - A small gap between neurones across which a nerve impulse is transmitted via neurotransmitters.

Telophase - The final stage of mitosis in which the spindle fibres break down, two new nuclear envelopes form around the daughter cells and the chromosomes disappear.