

WJEC (Wales) Biology A-level

Topic 1.6 - Cell division

Definitions and Concepts

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

Anaphase 1 - The third stage of meiosis 1 in which the homologous chromosomes are pulled to opposite poles (independent segregation) by spindle fibres.

Anaphase 2 - The third stage of meiosis 2 in which the centromeres divide and the sister chromatids are pulled to opposite poles by spindle fibres.

Bivalent - A pair of homologous chromosomes.

Cancer - A non-communicable disease resulting from uncontrolled mitosis.

Centromere - The structure on a chromosome that links the two sister chromatids.

Chromatid - One strand of a replicated chromosome.

Chromosome - A structure consisting of a long, coiled molecule of DNA and its associated proteins, by which genetic information is passed from generation to generation.

Crossing over - The process in meiosis 1 in which homologous chromosomes pair up, their chromatids wrap around one another and their alleles are exchanged at equivalent portions of chromatids. This creates genetic variation.

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

Gametes - Sex cells that have a haploid nucleus and are produced through meiosis.

Homologous chromosomes - A chromosome pair, one paternal and one maternal, with the same gene loci.

Independent segregation - The random separation of homologous chromosomes in meiosis 1 that produces genetic variation.

Interphase - The longest stage of the eukaryotic cell cycle in which cells grow and synthesise new organelles, proteins and DNA in preparation for mitosis.

Meiosis - A type of cell division that produces four genetically different daughter cells (gametes) with a haploid number of chromosomes. It involves two divisions.

Meiosis 1 - The first stage of meiosis in which the homologous chromosomes are separated to form two haploid cells.

Meiosis 2 - The second stage of meiosis in which the sister chromatids are separated to form four haploid gametes.

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



Metaphase 1 - The second stage of meiosis 1 in which the bivalent chromosomes align along the metaphase plate and independent segregation occurs.

Metaphase 2 - The second stage of meiosis 2 in which the recombinant chromosomes align at the cell equator.

Mitosis - A form of cell division that produces two genetically identical diploid daughter cells. It is important for the growth of tissue and repair and replacement of cells.

Prophase - The first stage of mitosis in which the chromosomes condense, centrosomes move to opposite poles of the cell, the mitotic spindle begins to form, the nucleolus disappears and the nuclear envelope breaks down.

Prophase 1 - The first stage of meiosis 1 in which the chromosomes condense, the mitotic spindle begins to form, the nucleolus disappears, the nuclear envelope breaks down, homologous chromosomes pair up and crossing over occurs, forming bivalents.

Prophase 2 - The first stage of meiosis 2 in which the chromosomes condense, the mitotic spindle begins to form, the nucleolus disappears and the nuclear envelope breaks down.

Sister chromatids - A pair of identical chromatids formed by DNA replication, joined by a centromere.

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

Telophase 1 - The final stage of meiosis 1 in which the spindle fibres break down, two new nuclear envelopes form around the sets of chromosomes and the DNA uncoils.

Telophase 2 - The final stage of meiosis 2 in which the nuclear envelopes reform around the separated chromatids (now called chromosomes) and they uncoil.

