

Cell and nuclear division

What happens in cell division?

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How does cytokinesis happen in an animal cell?

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How does cytokinesis happen in a plant cell?

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Name two examples of unequal cytokinesis.

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Why must the nucleus divide before the cell divides?

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Mitosis vs meiosis: effect on chromosome number?

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What does a chromosome consist of after DNA replication?

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How are chromosomes condensed and moved?

A ring of contractile actin and myosin proteins pinches the cell membrane inwards until the cytoplasm is split.

A parent (mother) cell divides to produce two daughter cells.

Oogenesis in humans (polar bodies are tiny) and budding in yeast.

Vesicles gather at the equator and assemble sections of new cell membrane and cell wall across the cell.

Mitosis maintains the chromosome number and genome; meiosis halves the chromosome number and generates genetic diversity.

To avoid producing anucleate cells (cells with no nucleus).

DNA supercoils around histones to condense; spindle microtubules and microtubule motor proteins move the chromosomes.

Two elongated DNA molecules (sister chromatids) held together until anaphase.

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Phases of mitosis in order?

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Why are the nuclei produced by mitosis genetically identical?

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How do you recognise metaphase in a micrograph?

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Diploid vs haploid?

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The two rounds of segregation in meiosis?

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What is non-disjunction, and an example?

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Two ways meiosis generates genetic diversity?

Water potential

How do ions dissolve in water?

Replication makes exact copies of each chromosome, and one chromatid of every chromosome goes to each pole in anaphase.

Prophase, metaphase, anaphase, telophase.

Diploid ($2n$): two of each type of chromosome. Haploid (n): one of each type of chromosome.

Chromosomes lined up across the equator (middle) of the cell, with no nuclear membrane.

Failure of homologous chromosomes or sister chromatids to separate in meiosis. Example: trisomy 21, Down syndrome.

Meiosis I: homologous chromosomes separate. Meiosis II: sister chromatids separate. Result: four haploid nuclei.

Cations attract the δ^- oxygen ends and anions the δ^+ hydrogen ends of polar water molecules, which surround them.

Crossing over between non-sister chromatids (prophase I) and random orientation of bivalents (metaphase I).

Water potential Hypertonic, hypotonic, isotonic?	Water potential Direction of osmosis in terms of solute concentration?
Water potential What happens to water in an isotonic environment?	Water potential How do you deduce the isotonic concentration of plant tissue?
Water potential What does standard error show?	Water potential Cell without a wall in hypotonic vs hypertonic medium?
Water potential What is the role of a contractile vacuole?	Water potential Turgor pressure vs plasmolysis?

From the less concentrated (hypotonic) solution to the more concentrated (hypertonic) solution.

Higher, lower or the same solute concentration compared with another solution.

Plot mean percentage change in mass or length against solute concentration; read where the line crosses zero.

Dynamic equilibrium: water moves in and out at equal rates, so there is no net movement.

Hypotonic: swells and bursts. Hypertonic: shrinks and crenates.

How precisely the mean is known from the repeats; shown as error bars, used to compare reliability.

Turgor: pressure on the wall in a hypotonic medium. Plasmolysis: membrane pulls away from the wall in a hypertonic medium.

Collects and expels water that enters freshwater unicellular organisms by osmosis, so they do not burst.

Water potential

Two medical uses of isotonic solutions?

Intravenous fluids and bathing organs ready
for transplantation.