

Cell biology

Cell structure

Eukaryotes and prokaryotes

Nucleus or not Single DNA loop Plasmids
Much smaller bacteria

Sub-cellular structures

Nucleus Mitochondria Chloroplasts Cell wall

Specialised cells

Sperm, nerve, muscle Root hair, xylem, phloem
Differentiation

Microscopy

Light microscope Electron microscope
Magnification equation Standard form

Required practical 1

Slide and cover slip Low power first Drawing and scale

Cell division

Chromosomes

Made of DNA Many genes Pairs

Cell cycle

Growth and DNA copying Mitosis Cytoplasm divides

Mitosis

Two identical cells Growth and development
Repair and replacement

Stem cells

Embryos Adult bone marrow Meristems in plants

Stem cell treatment

Diabetes, paralysis Therapeutic cloning
Viral infection risk Ethical objections

Plant cloning

Rare species Disease-resistant crops

Transport in cells

Diffusion

High to low concentration Oxygen, carbon dioxide, urea

Rate of diffusion

Concentration gradient Temperature Surface area

Surface area to volume ratio

Large in single cells Small in large organisms

Exchange surfaces

Large surface area Thin membrane Blood supply
Ventilation

Osmosis

Water only Partially permeable membrane
Practical: mass of plant tissue

Active transport

Against the gradient Energy from respiration
Root hairs, gut