

SUBJECT: Science

UNIT: Y7 Cells



Key Vocabulary Organelle

Part of a cell, nucleus for example.

Cell

Building blocks of living organisms.

Microscope

Apparatus to view small objects.

Magnification

Increase the scale of an image.

Resolution

The ability to distinguish two points from each other.

Unicellular: made of only one cell

Euglena: a unicellular organism

Key Equations

Magnification

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

Units and Quantities

Magnification: no unit but is written as x40 etc.

Image size and actual size are usually in mm

Cells

Cells are the building blocks of living organisms. There are lots of different types of cells.

Cell organelles

Nucleus – controls the cell, contains DNA

Mitochondria – where respiration occurs

Cell membrane – lets things in and out of the cell

Ribosomes – where protein synthesis occurs

Cytoplasm – where chemical reactions occur

Vacuole – contains cell sap

Chloroplasts – where photosynthesis occurs

Cell wall – supports the cell

Levels of Organisation

Organelles are parts of a cell, for example, the nucleus. Lots of cells that all have the same function are known as a tissue. Lots of tissues together make organs. Some organs working together for the same function is an organ system. Lots of organ systems working together is an organism.

Microscopes

There are two main types of microscopes: light microscopes and electron microscopes. Light microscopes are cheaper but their magnification and resolution are not as high. Electron microscopes are more expensive and their magnification and resolution are much higher.

To set up a microscope; place the slide onto the stage and secure with the clips. Put the lowest objective lens over the slide and look through the eyepiece. Adjust the coarse focus and then the fine focus to bring the image into focus.

Ambitious Vocabulary

Organelle Tissue
Adaptation Resolution

Animal and Plant Cells

Animal and plant cells are both eukaryotic and have some organelles that are the same however plant cells have three organelles that are different.

Specialised Cells

Root hair cell – function: absorb water and minerals from soil. Adaptations: large surface area for maximum absorption rate.

Palisade cell: function: carry out photosynthesis. Adaptation: lots of chloroplasts for photosynthesis.

Sperm cell: function: fertilise the egg cell. Adaptation: long flagella for movement.

Muscle cell: function: movement. Adaptation: lots of mitochondria for respiration to release energy.

Nerve cell: function: carry electrical signals around the body. Adaptation: long to increase the speed of movement of electrical signals.

Ciliated epithelial cell: function: move mucus away from the lungs. Adaptation: tiny hairs to brush mucus.

Red blood cell: function: transport oxygen around the body. Adaptation: no nucleus to make room for more oxygen.

White blood cell: function: fight pathogens which cause disease. Adaptation: engulf pathogens and produce antibodies.

Egg cell: function: to be fertilised by the sperm cell. Adaptation: contains nutrients for developing embryo.

Diffusion

Diffusion is the movement of particles from a high concentration to a low concentration. This can be through a semi-permeable membrane but does not have to be. Examples of diffusion into and out of cells include: oxygen and carbon dioxide into and out of red blood cells, glucose into and out of the mitochondria in cells to release energy through respiration.

Magnification

Magnification describes how much larger an image is under a microscope compared to the size of the actual object. It has no units and is written as follows: x100 (for example).

Resolution

Resolution describes how clear an image is. Its full definition is the ability to distinguish two points in an image.



While you were away

Lesson 1: Plant and animal cells

1. Name 3 organelles found in animal cells
2. Name 2 organelles found only in plant cells
3. What is the role of the nucleus?

Lesson 2: Microscopes

1. Name 2 types of microscope
2. Give one advantage of microscopes
3. What does magnification mean?

Lesson 3: Cell skills

1. Name three pieces of scientific equipment
2. Draw 2 pieces of scientific equipment

Lesson 4: Specialised cells

1. Name 3 different specialised cells
2. Describe the function of a sperm cell
3. Describe how a red blood cell is adapted.

Lesson 5: Unicellular organisms

1. What does unicellular mean?
2. Name one unicellular organism

Lesson 6: Diffusion

1. What is diffusion
2. Give two examples of diffusion