

Science Year 7 Knowledge Organiser: B1 Cells and Organisation

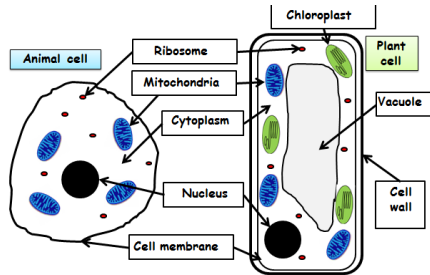
Overview of topic:

Cells are the building blocks of all living organisms. This unit explores plant cells, animal cells and even unicellular organisms which are organisms made of only one cell. You will also learn about how substances get into and out of these cells and the functions of their different parts (organelles).

Key content/ ideas/ concepts

Keywords/ Glossary

Plant and animal cell structure:



Using a microscope

Cells are very small and can only be seen using a microscope.

A light microscope uses a lens to produce a magnified image of an object.

Total magnification = eyepiece lens magnification x objective lens magnification

To make a slide:

Take a sample (e.g. onion cells) and place it onto a glass slide. Add some stain (e.g. iodine) and place a cover slip on top. Put the slide onto the stage and use the focusing knobs to view the sample.

Specialised cells

All young cells start of exactly the same—as stem cells. When they grow, stem cells change their structure to carry out a certain job this is called cell specialisation.

Nerve cells - are long to carry electrical impulses.

Muscle cells – can contract to create movement.

Sperm cells - have tails to swim and the head contains male genetic material. (DNA)

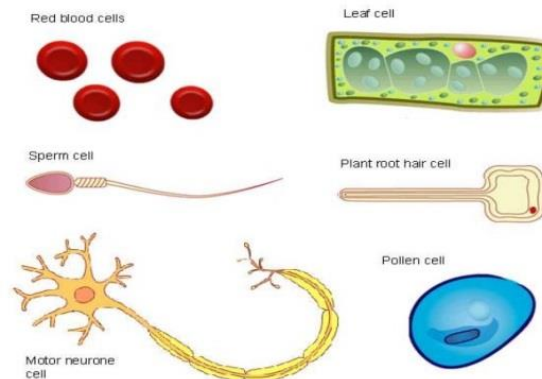
Egg cells - contain female genetic material.

Root hair cells - have a large surface area for diffusion and thin cell walls.

Epithelial cells - have cilia to waft substances.

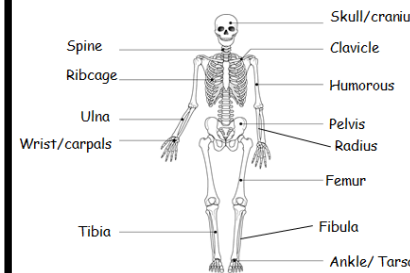
Palisade cells - have lots of chloroplasts for photosynthesis.

Red blood cell - has haemoglobin to carry oxygen and no nucleus.



The skeletal system

The functions of the skeletal system are movement, support and protection.



Joints:

Joints occur when 2 or more bones join together.

Hinge joint – for movement backwards and forwards.

Ball and socket joints – for movement in all directions

Fixed joints – Do not move at all

Cell- The building blocks of living organisms

Tissue- Groups of similar cells working together eg muscles and bones

Organ- A group of different tissues that work together eg the heart

Organ system- A group of organs that work together eg the digestive system

Cell membrane- Control what comes in and out of the cell.

Nucleus- Contains DNA and controls the cell

Cytoplasm- Jelly like substance where reactions take place.

Mitochondria- Where respiration takes place and energy is released.

Ribosomes- Where proteins are made

Cell wall- Plant cell only. Made of cellulose to support the cell

Vacuole- Plant cell only Contains cell sap and helps keep the cell firm.

Chloroplasts- Plant cell only. Absorbs light and where photosynthesis occurs.

Diffusion- The movement of particles from an area of high concentration, to low concentration.

Unicellular organisms- Organisms made of only one cell eg bacteria.

Diffusion is the movement of particles from a high concentration to a low one. You can increase the rate of diffusion by increasing temperature, concentration and pressure.

Wider reading:

http://www.bbc.co.uk/bitesize/ks3/science/organisms_behaviour_health/cells_systems/revision/1/

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Know it	Grasp it	Think it
1. Write a definition of a cell.	1. Explain how a root hair cell is adapted for its function.	1. Write a definition of a stem cell.
2. Draw a labelled diagram of an animal cell.	2. Explain how a sperm cell is adapted for its function.	2. Explain how a cell becomes specialised.
3. Which part of a cell controls what enters and leaves the cell?	3. Explain how a palisade cell is adapted for its function.	3. Explain why plant cells contain organelles that animal cells do not.
4. Describe the function of the nucleus.	4. Describe what diffusion is.	4. Write a comparison of plant cells, animal cells and bacteria cells.
5. Describe the function of the cytoplasm.	5. Explain the factors that affect the rate of diffusion.	5. Compare the light microscope and the electron microscope.
6. Describe the function of chloroplasts.	6. Describe two examples of diffusion in plants and animals.	6. Compare the processes of diffusion and active transport.
7. Describe the function of the cell wall.	7. Describe how you would view plant cells under the light microscope.	7. Explain why root hair cells do not contain chloroplasts.
8. What organelles are only found in plant cells?	8. Explain why iodine is added to your plant cell sample when viewing plant cells under the microscope.	8. Describe the function of ribosomes.
9. Write a definition of a specialised cell.	9. Write the equations for calculating magnification.	9. Explain two examples of cells which have high numbers of mitochondria.
10. Draw a labelled diagram of a root hair cell.	10. Describe what the independent, dependent and control variables are in an experiment.	10. Describe the stages of mitosis (cell division).
Total score	Total score	Total score