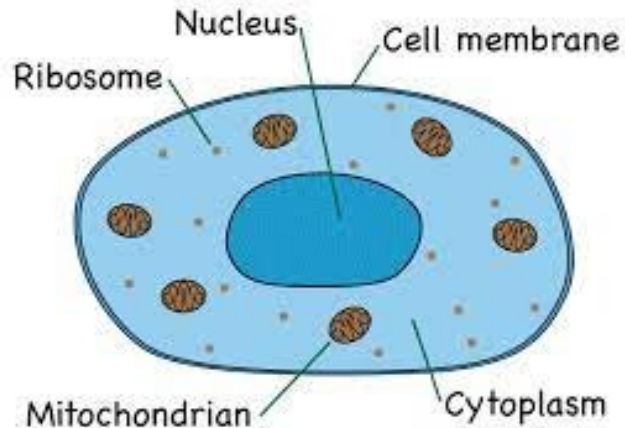




Your teacher will tell you which topic you should revise. Read and learn all the information in the topic, ready for a Quiz in lesson.

Topic 1: Animal and plant cells

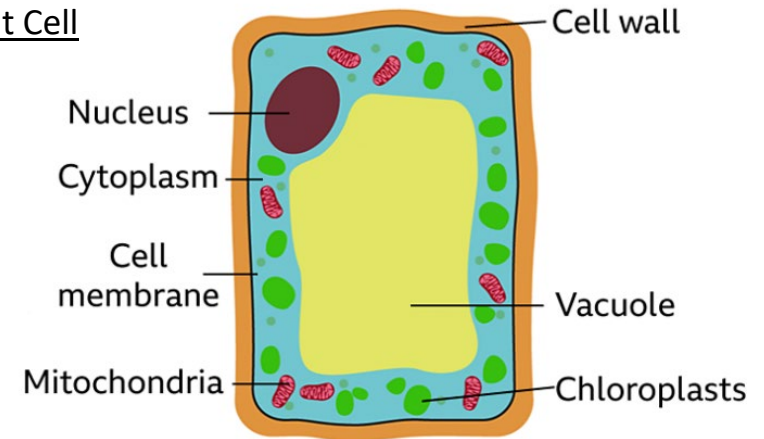
Animal Cell



The four key components of most cells are:

- **Nucleus** - this contains the genetic material (DNA) of the organism and controls the cell's activities.
- **Cytoplasm** - the liquid that makes up most of the cell in which chemical reactions happen. This is mainly water.
- **Cell membrane** - a flexible outer layer that surrounds the cell and controls which substances can pass into and out from it.
- **Mitochondria** - tiny parts of cells floating in the cytoplasm where energy is released from glucose from food. The mitochondria, found in the cell cytoplasm, are where most respiration happens.

Plant Cell



As well as the four key components,

Plant cells also have these extra three as well:

- **Cell wall:** a tough outer layer of the cell, which contains cellulose to provide strength and support to the plant.
- **Vacuole:** a space inside the cytoplasm that contains a watery liquid called cell sap. It keeps the cell firm.
- **Chloroplasts:** structures found in the cells of green parts of plants only (leaves and stems) which contain a green pigment called chlorophyll in which photosynthesis occurs.



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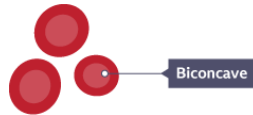
Topic 2: Cell adaptations

Specialised Cells

Some cells are different to animal and plants cells. They are specialised to do a specific job in the

Red blood cells carry oxygen around the body, which is needed for respiration.

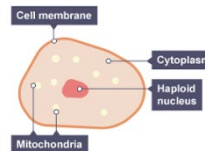
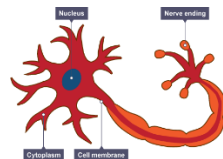
They are well suited to this function because:



- They contain haemoglobin, which carries oxygen molecules.
- They don't have a nucleus, allowing more space to carry oxygen.
- They are a flat disc shape with dips on both sides (biconcave). This gives them a large surface area, and the best chance of absorbing as much oxygen as they can in the lungs.

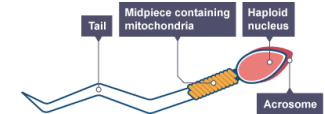
Nerve cells transmit electrical signals in the nervous system. They are well suited to their function because:

- They are thin and can be more than one metre long in your spinal cord. This means they can carry messages up and down the body over large distances very quickly.
- Nerve cells have branched connections at each end. These join to other nerve cells, allowing them to pass messages around the body.
- They have a fatty (myelin) sheath that surrounds them. The fatty sheath increases the speed at which the message can travel.



Sperm are the male sex cell. They are made in the testes after puberty. They join with an egg cell during fertilisation to form an embryo which can then develop into a new life. The following features make them well suited to this function:

- A tail moves them towards an egg cell.
- Many mitochondria release energy for movement.
- Part of the tip of the head of the sperm, called the acrosome, releases enzymes to digest the egg membrane to allow fertilisation to take place.
- The haploid nucleus contains the genetic material for fertilisation.
- Sperm are produced in large numbers to increase the chance of fertilisation.



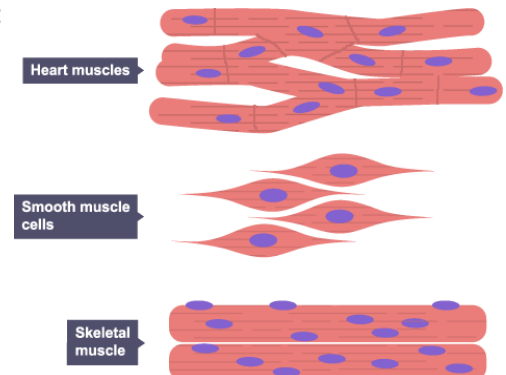
Eggs are the female sex cell. They are made in the ovaries before birth. Usually, one egg is released each month during the menstrual cycle, but sometimes this number may be higher. They join with a sperm cell during fertilisation to form an embryo which can then develop into a new life. They are well suited to this function because:

- The egg cell's cytoplasm contains nutrients for the growth of the early embryo.
- The haploid nucleus contains genetic material for fertilisation.
- The cell membrane changes after fertilisation by a single sperm so that no more sperm can enter.

Muscle cells

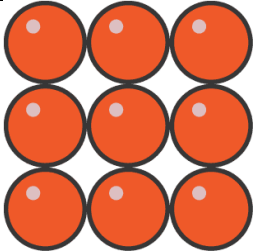
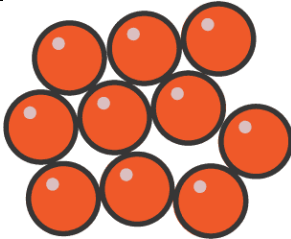
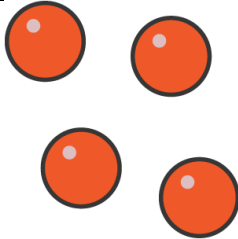
Muscle cells are found in bundles which make up our muscles. These cells are able to contract (get shorter) and relax (return to original length). There are different types of muscle cell, each perfectly adapted to its function:

- Cardiac (heart) muscle cells contract and relax to pump blood around our bodies for our entire lives. They never get tired.
- Smooth muscle cells make up thin sheets of muscle, such as the stomach lining. They can also be arranged in bundles, or rings, like that in the anus.
- Skeletal muscle is joined to bones. Its cells contract to make bones move and joints bend.





Your teacher will tell you which topic you should revise. Read and learn all the information in the topic, ready for a Quiz in lesson.

Topic 3: Particles and matter		
Key points		
<ul style="list-style-type: none">• Almost everything is made of particles.• Particles can be atoms, molecules or ions.• Particles behave differently in solids, liquids and gases.• The particle model explains the differences between solids, liquids and gases.		
		
<ol style="list-style-type: none">1. Lots of materials are solid, such as paper, bricks, wood, metal, and ice.2. The particles are very close together3. Cannot usually be compressed or squashed.4. Forces of attraction between the particles hold them together and keep them in place.5. Particles are arranged in a regular way.6. Particles move only by vibrating about a fixed position.7. Have a fixed shape and means that they cannot flow like liquids.8. The hotter a solid gets, the faster its particles vibrate. This means that solids expand when they are heated.	<ol style="list-style-type: none">1. There are many different liquids such as water, oil, fruit juice, and many others.2. The particles in liquids are arranged in a random way,3. Particles are close together, touching many of their neighbours.4. There are some gaps, but liquids cannot usually be compressed or squashed.5. The particles of a liquid have enough energy to break free of some of the forces of attraction between the particles. So, particles in liquids can move around and can move over each other, allowing liquids to flow and be poured.	<ol style="list-style-type: none">1. There are lots of different gases, such as the air we breathe, or the helium used to fill balloons.2. The particles in gases are widely spaced and randomly arranged3. meaning they can be easily compressed or squashed.4. The particles in a gas have enough energy to overcome the forces of attraction between the particles, so are free to move in any direction.5. They move quickly in straight lines, colliding with each other and the walls of their container.6. There are large spaces between the particles of a gas. These spaces between particles are empty, there is nothing in them.



Vocabulary	Wider Research	Apply
<ol style="list-style-type: none">1. Cell2. Animal3. Plant4. Nucleus5. Cytoplasm6. Mitochondria7. Ribosome8. Cell membrane9. Cell wall10. Vacuole11. Chloroplast12. DNA13. Structure14. Oxygen15. Molecule16. Blood17. Nerve18. Egg19. Sperm20. Muscle21. Solid22. Liquid23. Gas24. Particle25. Model26. Mass27. Material28. Compressed29. Squashed30. Force31. Collide	<p>Animal and Plant cells https://www.bbc.co.uk/bitesize/topics/znyycdm/articles/zkm7wnb</p> <p>Specialised cells https://www.bbc.co.uk/bitesize/topics/znyycdm/articles/zfj3rwx</p> <p>Solids, Liquids and Gases https://www.bbc.co.uk/bitesize/topics/z9r4jxs/articles/zqp7p3</p>	<p>Animal and Plant cells</p> <ol style="list-style-type: none">1. Draw and Label the Animal Cell Can you name the organelles and their functions?2. Research about plant cells. Can you find out some other plant adaptations? Think about countries, different weather conditions and predators.3. Research specialised cells. What other specialised cells are there that are not on the knowledge organiser? <p>Solids, Liquids and Gases</p> <ol style="list-style-type: none">1. Draw and describe the 3 states of matter (solid, liquid, gas) Describe them in as much detail as you can.2. What are the similarities and differences between the 3 states of matter?