SMITH'S WOOD ACADEMY

Home learning activities

Subject
Science
Year Group
Year 7
Unit of work / Knowledge organiser
Cells and Specialised Cells - Revision
Activities
• Complete the 'Knowledge Check' by clicking on the link below (Mr Tobi has also emailed this link out to you): https://forms.office.com/Pages/ResponsePage.aspx?id=tWaUKrjGMEuM3bZvypd0-1JR5WsjuLFPvbjI4VXu0Y1URTlWQ1pFNkkzVU5FWDZXN0M4R0lBMVpNTS4u • Read through both pages of the 'Knowledge Organiser' on 'Cells Revision'. • Make careful and detailed notes on Sections 1-4, including writing out the 'Key Words' and their definitions in Section 1. • Write down an explanation of the function of the 'Cell Membrane' without looking at your earlier notes from Section 1. • Complete the 'Test Yourself' activity, completing the missing labels and answering the questions; the answers are provided at the end, but do not look at these until you have tried to complete the work yourself (**be strict with yourself here**). • Complete the 'Cells' exam-style question. Use the mark scheme (**once you have tried the question**) to mark your answers carefully.
Where do you complete the work?
In Study Books.
What to do if you finish the work? (Extension activity)
• Make sure you have completed the previous set work on 'Energy – Heating and Cooling' and then work on the 'Mini Project' on 'Cells'.

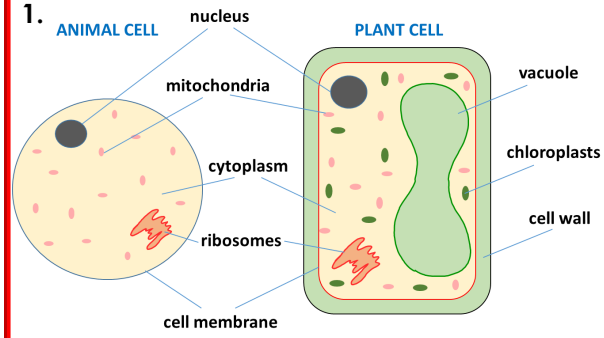
SMITH'S WOOD ACADEMY

These websites might help:
• BBC Bitesize -> Secondary -> KS3 -> Science -> Biology -> Living Organisms
If you are struggling with your work or if you have finished.
Please email your classroom teacher directly using the email list found in the Home Learning section of the website.

Year 7—Cell Revision 1

SMITH'S WOOD ACADEMY

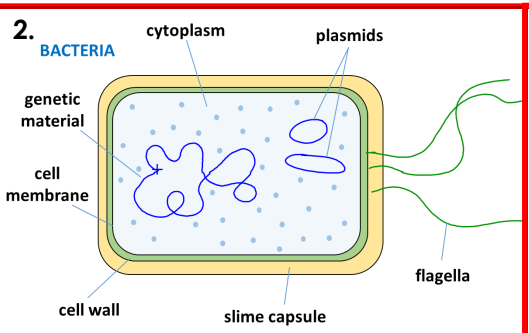
1.



Animal and plant cells are **eukaryotic cells**; they have all their genetic information enclosed within a nucleus.

Cell part	Function
Nucleus	Controls cell activities and contains the genetic information.
Cytoplasm	A liquid gel where most of the chemical reactions needed for life take place.
Cell membrane	Controls the passage of substances into and out of the cell.
Mitochondria	Respiration takes place here, releasing energy.
Ribosomes	Protein synthesis takes place here.
Cell wall	Strengthens the cell and gives it support. Made of cellulose.
Chloroplasts	Contain chlorophyll to absorb light for photosynthesis.
Vacuole	Filled with cell sap to keep the cell **turgid**.

2.



Bacterial cells are much smaller than plant and animal cells. Bacteria are **prokaryotic cells**; Their genetic information is not enclosed in a nucleus, but is a single DNA loop with one or more small rings of DNA called **plasmids**.

Some bacterial cells have a **slime capsule** (for protection) and **flagella** (for movement).

Scientists' knowledge of cells and their structures has improved over time due to the invention of microscopes with higher **magnifications** and better **resolutions**.

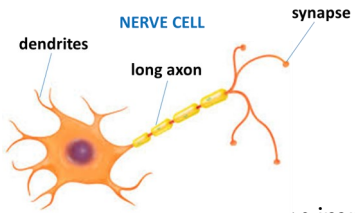
<u>Mid-17th Century:</u> Light microscopes were developed and allowed magnifications of around 2000 times.

<u>1930s:</u> The electron microscope was invented and allowed magnifications of around 2000000 times. They also have much better resolutions.

$$\text{Magnification} = \frac{\text{Size of image}}{\text{Size of real object}}$$

3.

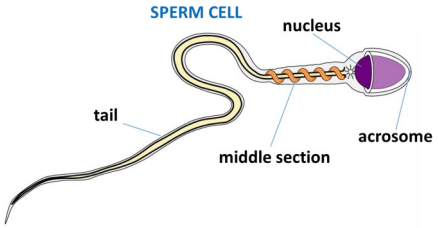
Specialised animal cells:



- A long **axon** that carries impulses from one place to another.
- **Synapses** to pass on impulses via **neurotransmitters**.
- **Dendrites** to connect to other nerve cells.

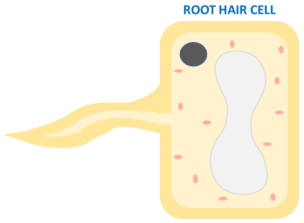
MUSCLE CELLS

- Contain **proteins** that slide over each other making the cells **contract**.
- Contain stores of **glycogen** for energy.
- Contain many mitochondria to release energy.

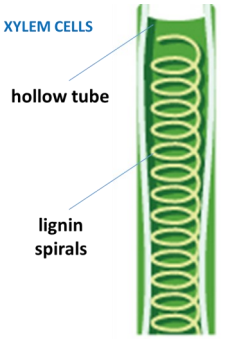


- Long tail for movement.
- Middle section containing mitochondria to release energy for movement.
- Acrosome contains digestive enzymes for breaking down the outer layer of the egg cell.

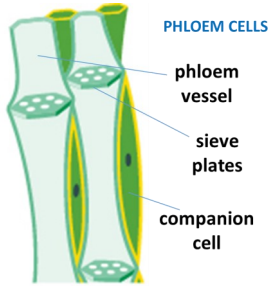
Specialised plant cells:



- Large **surface area** to allow water to move into the cell.
- Many mitochondria to release energy for **active transport** of minerals.



- Dead cells that form a hollow tube for transporting water.
- Lignin spirals provide strength.



- Hollow vessel for carrying food.
- Sieve plates allow water carrying dissolved food to move freely through the tube.
- Supported by companion cells to keep them alive.

Year 7—Cells Revision 2

SMITH'S WOOD ACADEMY

6. Cells

Cells are the building blocks of life – they are the smallest units in an organism.

Specialised cell: Has a particular shape and structure to carry out a specific job

Cytoplasm: Jelly like substance where most chemical processes happen.

Chloroplast: Absorbs light energy so the plant can make food (photosynthesis).

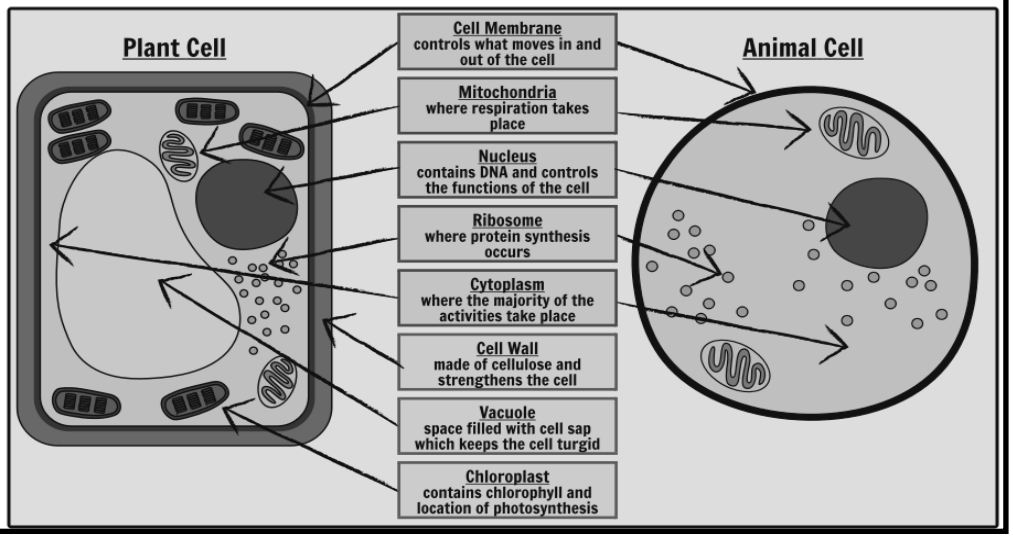
Cell membrane: Surrounds the cell and controls movement of substances in and out.

Nucleus: Contains genetic material (DNA) which controls the cell's activities.

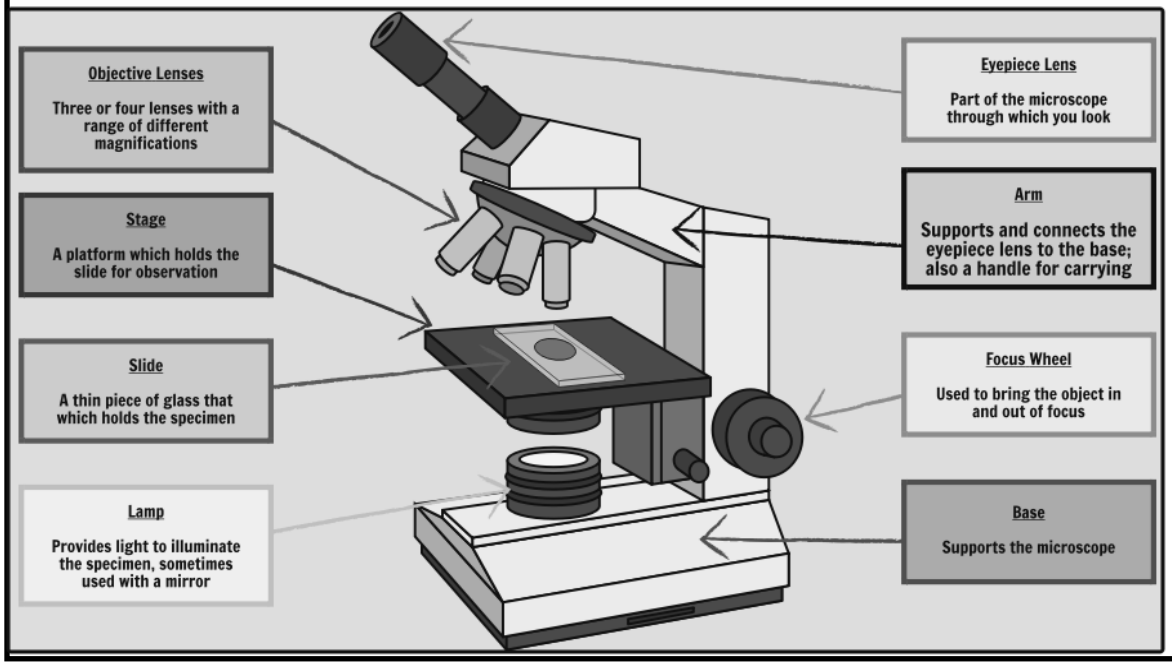
Vacuole: Area in a cell that contains liquid and can be used by plants to keep the cell rigid and store substances.

Mitochondria: Part of the cell where energy is released from food molecules.

Cell Wall: Strengthens the cell. In plant cells it is made from cellulose.



7. Microscopy



Even larger human cells - like the skin cell - are 20 times smaller than a grain of salt. A red blood cell is much smaller than that. To allow us to see detail in these cells, we need the help of a microscope.

Making slides

A slide is a thin piece of glass used to hold objects which are examined under a microscope.

Plant cells

1. Peel a thin, transparent layer of epidermal cells from the inside of an onion.
2. Place cells on a microscope slide.
3. Add a drop of water or iodine (a chemical stain).

Lower a coverslip onto the onion cells using forceps or a mounted needle. This needs to be done gently to prevent trapping air bubbles.

Animal cells

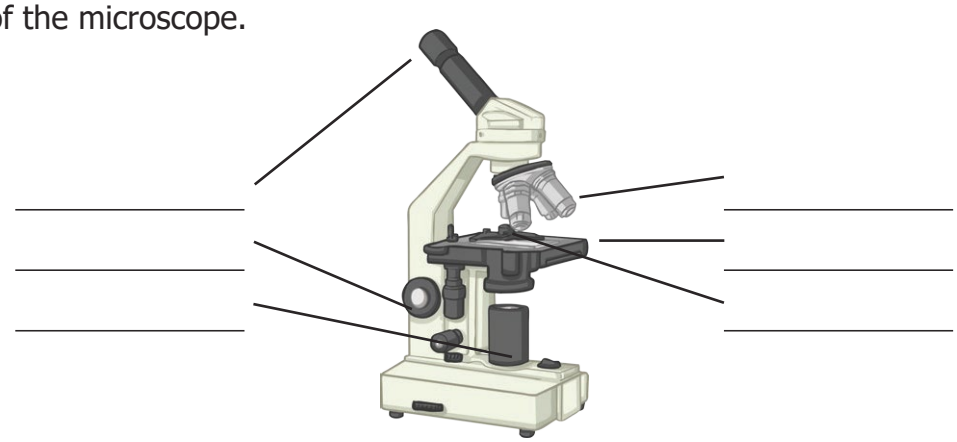
1. Remove cells from the inside of your cheek using a cotton bud.
2. Smear the cotton bud onto a microscope slide.
3. Add a drop of methylene blue (a chemical stain).

Lower a coverslip onto the cheek cells using forceps or a mounted needle. This needs to be done gently to prevent trapping air bubbles.

Cells Test Yourself

Microscope

Label the parts of the microscope.



Slide, focusing wheel, mirror, stage, eyepiece lens, objective lens.

Specialised Cells – Quick Questions

Sperm Cell

1. What is the function of the sperm tail? _____
2. How does the sperm penetrate the egg? _____
3. Where in the cell is the genetic material contained? _____

Palisade Cell

1. Where would you find palisade cells? _____
2. The palisade cell contains lots of chloroplasts, why? _____
3. Name 3 things found in a palisade cell not found in an animal cell. _____

Nerve Cell

1. What is the function of the nerve cell? _____
2. How are messages transmitted inside the nerve cell? _____

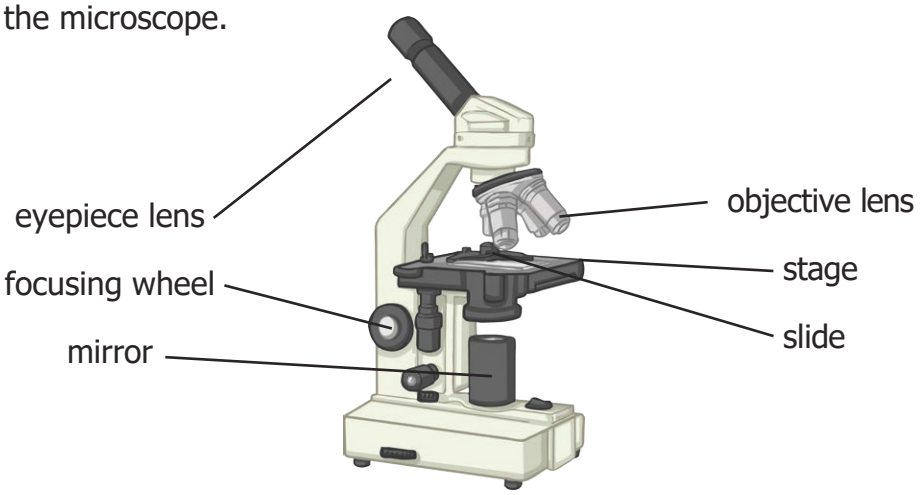
Root Hair Cell

1. Is a root hair cell an animal cell or a plant cell? _____
2. What is the function of root hair cells? _____

Cells Test Yourself Answers

Microscope

Label the parts of the microscope.



Specialised Cells – Quick Questions

Sperm Cell

1. What is the function of the sperm tail? **To help sperm swim /move towards the egg.**
2. How does the sperm penetrate the egg? **The head of the sperm contains enzymes that digest their way into the egg.**
3. Where in the cell is the genetic material contained? **Nucleus.**

Palisade Cell

1. Where would you find palisade cells? **Top side of a leaf.**
2. The palisade cell contains lots of chloroplasts, why? **To aid photosynthesis.**
3. Name 3 things found in a palisade cell not found in an animal cell. **Cell wall, vacuole, chloroplasts.**

Nerve Cell

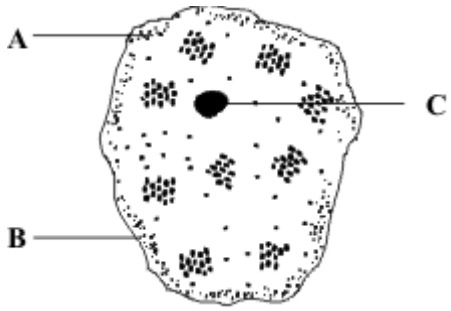
1. What is the function of the nerve cell? **To transmit messages.**
2. How are messages transmitted inside the nerve cell? **Through electrical impulses.**

Root Hair Cell

1. Is a root hair cell an animal cell or a plant cell? **Plant cell.**
2. What is the function of root hair cells? **To absorb water and minerals from the soil.**

Cells – Exam-Style Question

Q1. The diagram shows an animal cell.



(a) Name **each** labelled part and give its function.

A Name .....

Function .....

.....

B Name .....

Function .....

.....

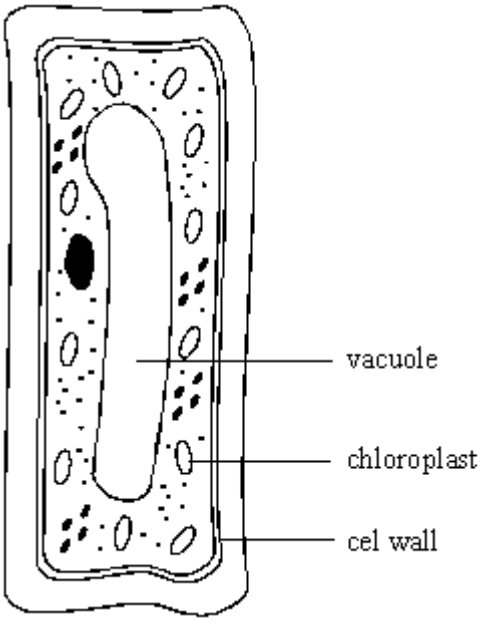
C Name .....

Function .....

.....

(6)

(b) (i) This plant cell also contains chloroplasts, a cell wall and a vacuole. Label **each** of these parts on the diagram.



(3)

(ii) Give the function of these parts of a plant cell.

Chloroplast function .....

.....

Cell wall function .....

.....

Vacuole function .....

.....

(3)
(Total 12 marks)

Cells – Exam-Style Question – Answers

M1. (a) A cytoplasm

1

where (chemical) reactions take place

*do **not** accept where cell functions take place*

1

or

carries/holds the organelles/named organelles / named chemicals (including nutrients)

*do **not** accept keeps the shape of the cell*

or

contains water

or

presses out on the membrane

allow: keeps cell turgid
allows transport through the cell

B membrane

*do **not** accept by themselves:*
protects cell
gives shape

1

controls what enters/leaves the cell

1

or

contains the cell/holds the cell together

*do **not** accept keeps harmful substances out*

or

allows movement into and out of the cell C nucleus

1

contains the genetic material/DNA/genes/chromosomes

*do **not** accept:*
brain of the cell
stores information/instructions
tells cell what to do

or

controls (the activity) of the cell

1

(b) (i) one mark for each correctly labelled part

cell wall
*do **not** accept anything inboard of the inner edge vacuole*
accept anything inboard of transplant

chloroplast: site of photosynthesis/ for photosynthesis
*accept word equation **or** balanced equation*

1

cell wall: supports the cell/keeps the shape/keeps it rigid
*do **not** accept protects the cells*

2

(ii) vacuole: acts as reservoir for water / chemicals/(cell)/sap

3

or
keeps cell turgid/pushes content to edge
or
maintains concentration gradient
or
allows cell elongation (not growth)

1

[12]

Cells

Watch this video:https://www.youtube.com/watch?v=v2lHztS4sMU&t=7s

Task	Description
1	Make a poster to show a Animal cell, Label the parts and explain the function
2	Make a poster to show a Plant cell, Label the parts and explain the function.
3	Visit the website cellsalive.com
4	Explain the difference between a plant cell and a Animal cell
5	Pick an organ in the body and explain its structure and function
6	Make a model of a specialised cell - Sperm cell, nerve cell, red blood cell
7	Define these key words - Nucleus, Cytoplasm, Cell membrane, tissue, organ, Specialised.
8	Make a mind map of the whole cells topic - include animal cells, plant cells, specialised cells.