



KS3 Science Challenge Booklet: Cells

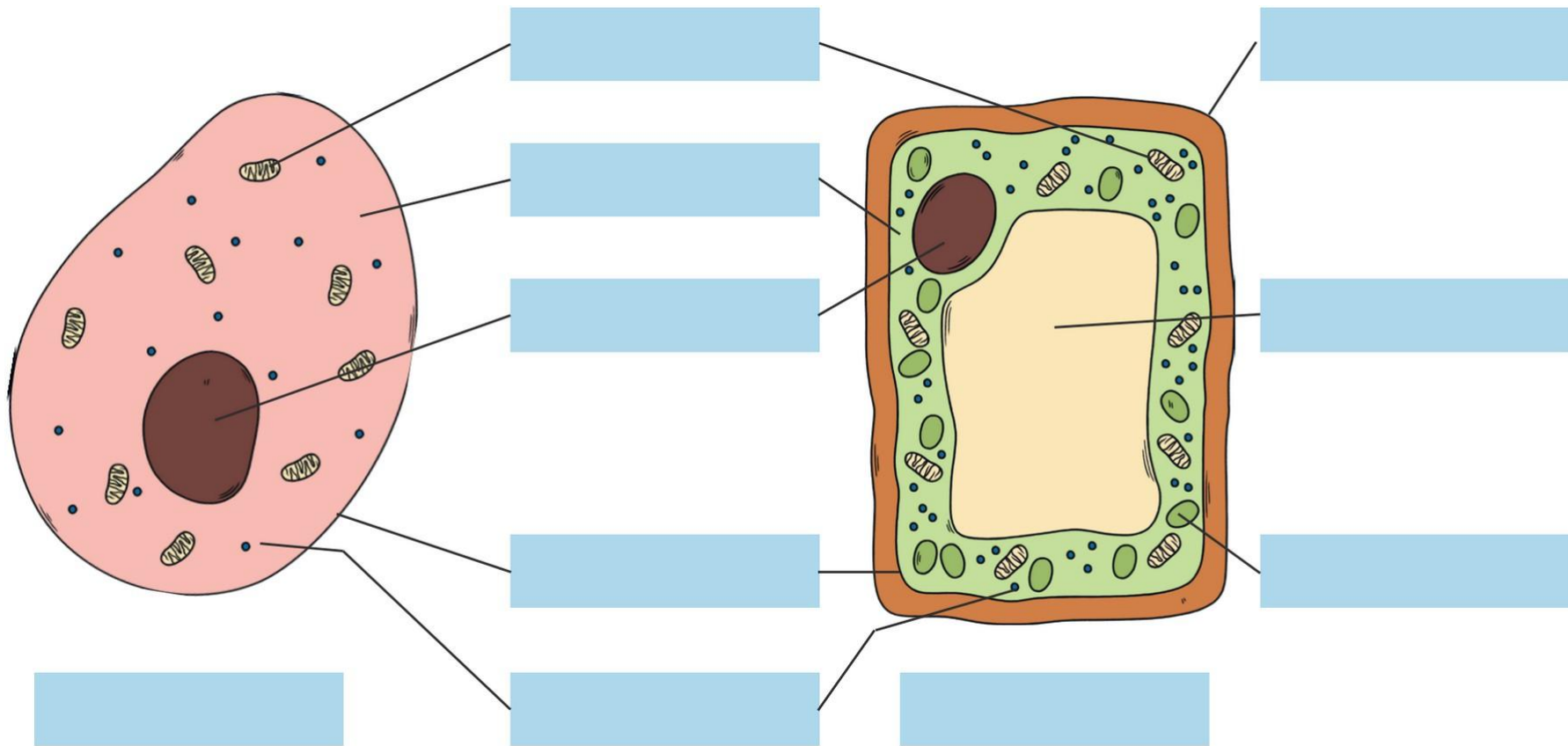
Name:

Science Teacher:

Science Group:

Task: use the keywords below to fill in the missing words below.

Keywords: Animal cell, Plant cell, Nucleus, Cell membrane, Mitochondria, Cytoplasm, Cell wall, Chloroplast, Ribosomes

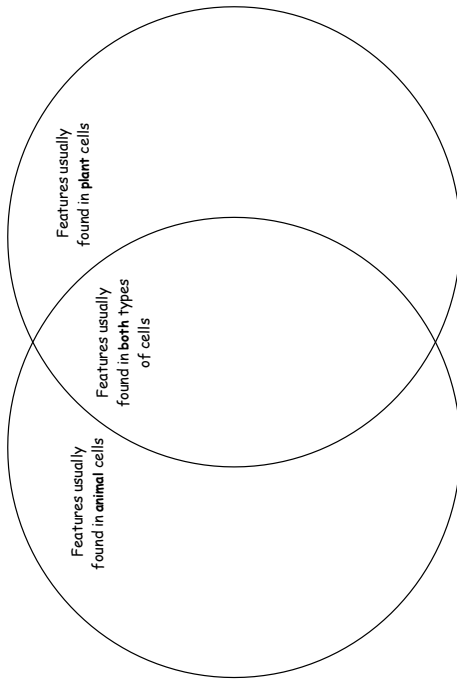


1. Which three organelles are only found in plant cells?
2. What process occurs in the mitochondria?
3. Name the process which occurs in the chloroplast.

4. Explain the role of the nucleus.
5. Why are chloroplasts not found in the roots of plants?

Task 1: complete the Venn diagram below using the keywords below. Use a pencil if you are unsure

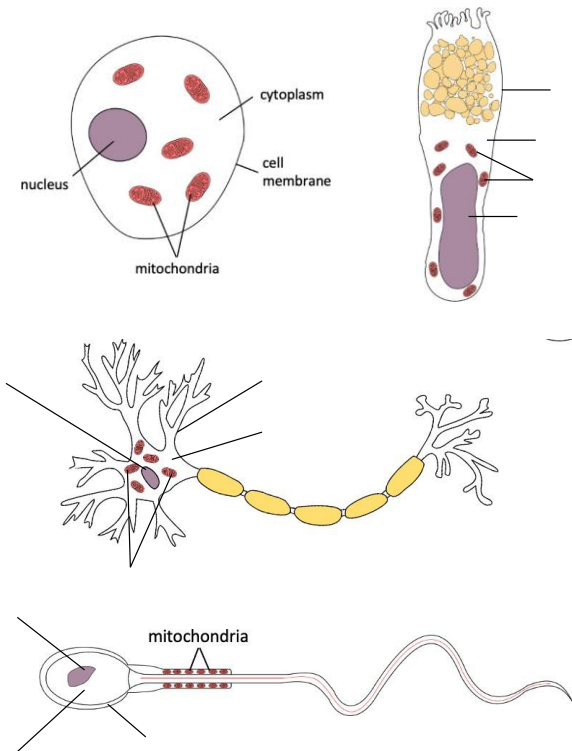
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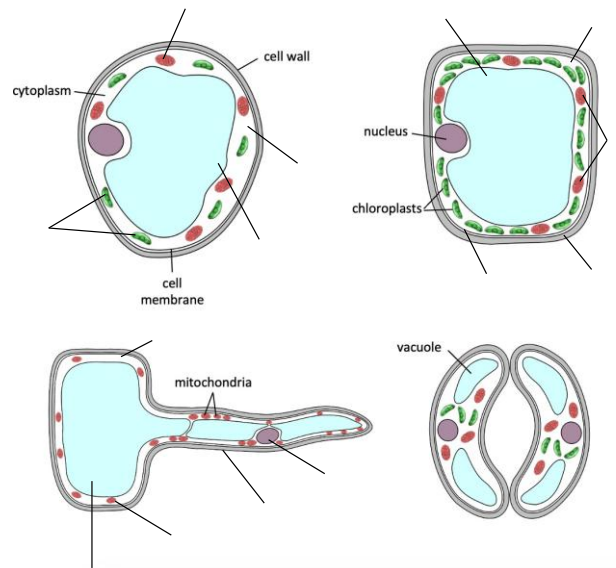
Task 2: Match up the organelle with the correct function. The first one has been done for you.

Organelle	Function
Nucleus	All the proteins needed for the cell are synthesised (made) here
Permanent Vacuole	Chemical reactions needed for life occur in this liquid gel.
Mitochondria	Controls the movement of substances in to and out of the cell.
Cell Wall	This is where oxygen is used and most of the energy is released during respiration.
Cytoplasm	Large space containing cell sap. Helps to keep cells rigid to support the plant.
Cell membrane	Contains chlorophyll, a green substance that absorbs light energy to make food by photosynthesis.
Chloroplast	Made of cellulose & forms a rigid non-living box around the cell to strengthen & provide support.
Ribosomes	Controls all activities of the cell. Contains the genes on chromosomes.

Task 3: below is a diagram of a typical animal cells. Can you label the other animal cells using the same labels?



Task 4: below are four diagrams of plant cells. Some parts are labelled, can you label the missing parts?



Diffusion

Task: complete the sentences below by filling in the missing vowels.

Diffusion can occur in _____ and _____.
 Diffusion is the m_____ of _____ from a
 h_____ concentration to an area of l_____ concentration.

Task: draw 10 particles in the boxes below to show the process of diffusion.

Before

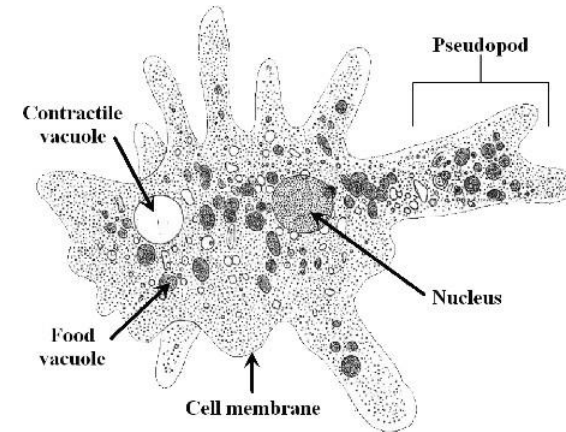
During

After

Task: Create a list of examples of diffusion. You may want to think about example of diffusion in cells and in everyday scenarios.

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-
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Single celled organisms



- Amoeba is a unicellular organism. However, unlike other single-celled organisms, amoeba doesn't have any fixed shape. It looks more like a blob of jelly.
- The amoeba moves by constantly changing its body shape. This also helps it to gather food. When the amoeba changes its body shape, some parts extend to form pseudopods, which mean false legs. These pseudopods are responsible for the mobility of the amoeba.
- The amoeba reproduces by dividing itself into two. So, it can be argued that technically the amoeba never dies.

Task: do you think the Amoeba is an animal or plant? Explain your reasons below.

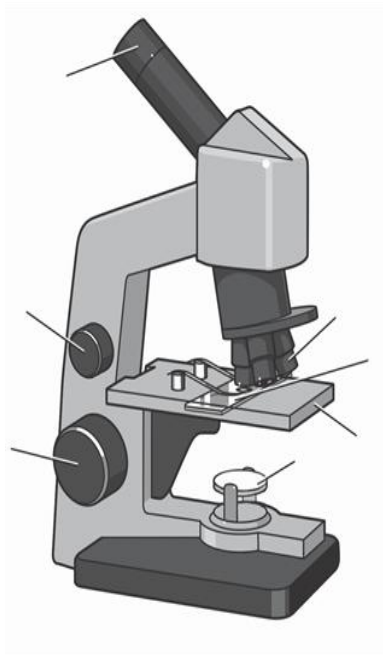
Using a light microscope

Task: put the following in order of size, from smallest to largest.

an amoeba
 your cheek
 cell red blood
 cell bacteria
 virus
 atom



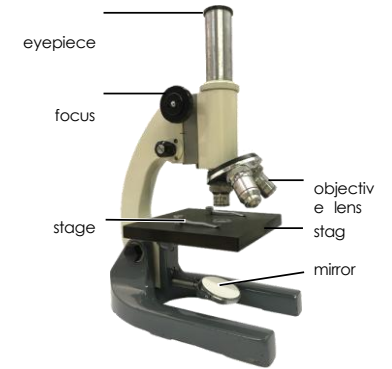
Task: Using the keywords in the box below, label the diagram of the light microscope.



Keywords: Eye piece, coarse focus, fine focus knob, mirror, objective lens, stage

Safety

- Be very careful when handling glass slides.
- If your microscope has a mirror, **never** use it to reflect direct sunlight.
- If your microscope has a light, **never** look down the eyepiece without a slide on the stage.
- Always start with the slide near the objective lens and then move it **away** from the lens, so that the lens does not smash the slide.





EXT: Explain why you cannot see all of the structures inside of animal cells when using a light microscope

Mr Jones has set his class some biology homework. He decides to hand the work to you for marking. For each answer, read the question and decide who has got the answer correct and award marks appropriately.

Question 1

Draw a diagram of an animal cell. Label the nucleus.

Student A	Student B
 <p style="text-align: right;">/3</p>	 <p style="text-align: right;">/3</p>

a) Who got it correct?

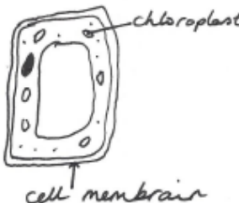
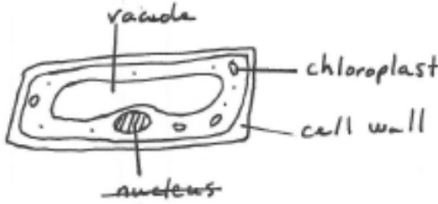
b) Clearly explain anything that is wrong. State which student made each error.

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Question 2

Draw a diagram of a plant cell. Label 3 parts that are just found in plant cells.

Student A	Student B
 <p style="text-align: right;">/3</p>	 <p style="text-align: right;">/3</p>

a) Who got it correct?

b) Clearly explain anything that is wrong. State which student made each error.

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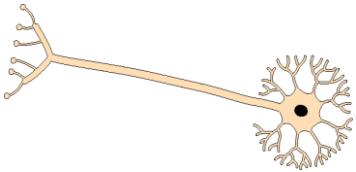
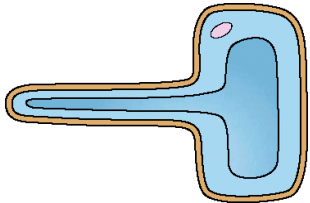
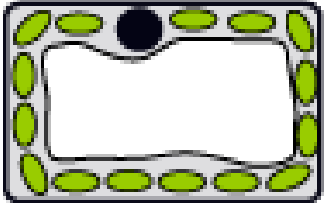
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Specialised cells

Task: Complete the questions below for the specialised cells

<p>Sperm cell</p> 	<p>What does its tail do?</p> <hr/> <p>What is in its head?</p>
<p>What is its role?</p>	
<p>Nerve cell</p> 	<p>Why do they have connections at either end?</p>
<p>What is its role?</p>	
<p>Root hair cell</p> 	<p>Where is it found?</p> <hr/> <p>Why does it have a large surface area?</p>
<p>What is its role?</p>	
<p>Leaf cell</p> 	<p>Why does it have a lot of chloroplast?</p>
<p>What is its role?</p>	

