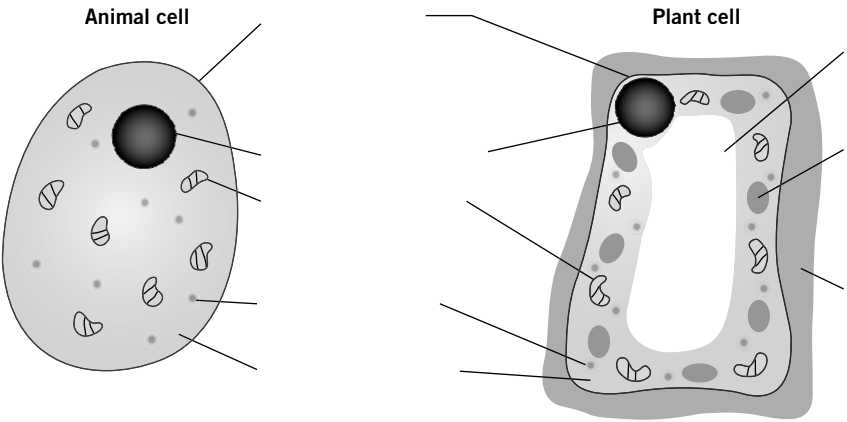


# Chapter 1: Cell biology and transport

## Knowledge organiser

### Eukaryotic cells

Animal and plant cells are eukaryotic. They have genetic material (DNA) that forms **chromosomes** and is contained in a **nucleus**. Label the diagram.

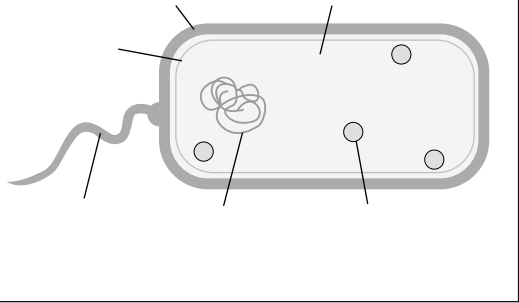


### Prokaryotic cells

Bacteria have the following characteristics:

- 
- 
- 
- 

Label the diagram.



### Microscopes

Light microscope	Electron microscope
	uses a beam of electrons to form images
living samples can be viewed	
relatively cheap	
	high magnification
	high resolution

Electron microscopes allow you to see sub-cellular structures, such as \_\_\_\_\_, that are too small to be seen with a light microscope.

**L** To calculate the **magnification** of an image:

magnification = \_\_\_\_\_

### Specialised cells

Cells in animals and plants differentiate to form different types of cells. Most animal cells differentiate at an early stage of development, whereas a plant's cells differentiate throughout its lifetime. Complete the table.

Specialised cell	Function	Adaptations
		<ul style="list-style-type: none"><li>•</li><li>•</li></ul>
		<ul style="list-style-type: none"><li>•</li><li>•</li><li>•</li></ul>
		<ul style="list-style-type: none"><li>•</li><li>•</li></ul>
		<ul style="list-style-type: none"><li>•</li><li>•</li></ul>
		<ul style="list-style-type: none"><li>•</li><li>•</li></ul>
		<ul style="list-style-type: none"><li>•</li><li>•</li></ul>

### Comparing diffusion, osmosis, and active transport

	Diffusion	Osmosis	Active transport
<b>Definition</b>	The spreading out of particles, resulting in a net movement from an area of _____ to an area of _____. Factors which affect the rate of diffusion: _____, _____, and _____.	The diffusion of water from a _____ solution to a _____ solution through a _____.	The movement of particles from a more dilute solution to a more concentrated solution using energy from _____.
<b>Movement of particles</b>	Particles move down the _____ – from an area of <i>high</i> concentration to an area of <i>low</i> concentration.	Water moves from an area of <i>lower</i> _____ concentration to an area of <i>higher</i> solute concentration.	Particles move against the concentration gradient – from an area of <i>low</i> concentration to an area of <i>high</i> concentration.
<b>Energy required?</b>	_____	_____	_____
<b>Examples</b>	<b>Humans</b> <ul style="list-style-type: none"><li>•</li><li>•</li><li>•</li></ul> <b>Fish</b> <ul style="list-style-type: none"><li>•</li><li>•</li></ul> <b>Plants</b> <ul style="list-style-type: none"><li>•</li><li>•</li></ul>	<b>Plants</b> <ul style="list-style-type: none"><li>•</li></ul>	<b>Humans</b> <ul style="list-style-type: none"><li>•</li></ul> <b>Plants</b> <ul style="list-style-type: none"><li>•</li></ul>



#### Key terms

Make sure you can write a definition for these key terms.

cell membrane cell wall chloroplast chromosome  
concentration cytoplasm dilute DNA eukaryotic  
gill filaments gradient magnification mitochondria  
nucleus partially permeable membrane passive process  
permanent vacuole plasmid prokaryotic resolution  
ribosome root hair cell stomata

# Chapter 1: Cell biology and transport

## Retrieval questions

Answer the following questions using the information from the knowledge organiser.

B1 questions		Answers	
1	What are two types of eukaryotic cell?		
2	What type of cell are bacteria?		
3	Where is DNA found in animal and plant cells?		
4	What is the function of the cell membrane?		
5	What is the function of mitochondria?		
6	What is the function of chloroplasts?		
7	What is the function of ribosomes?		
8	What is the function of the cell wall?		
9	What is the structure of the main genetic material in a prokaryotic cell?		
10	How are electron microscopes different to light microscopes?		
11	What is the function of a red blood cell?		
12	Give three adaptations of a red blood cell.		
13	What is the function of a nerve cell?		
14	Give two adaptations of a nerve cell.		
15	What is the function of a sperm cell?		
16	Give two adaptations of a sperm cell.		
17	What is the function of a palisade cell?		
18	Give two adaptations of a palisade cell.		
19	What is the function of a root hair cell?		
20	Give two adaptations of a root hair cell.		
21	What is diffusion?		
22	Name three factors that affect the rate of diffusion.		
23	How are villi adapted for exchanging substances?	<ul style="list-style-type: none"><li></li><li></li><li></li></ul>	
24	How are the lungs adapted for efficient gas exchange?	<ul style="list-style-type: none"><li></li><li></li><li></li><li></li></ul>	
25	How are fish gills adapted for efficient gas exchange?	<ul style="list-style-type: none"><li></li><li></li><li></li></ul>	
26	What is osmosis?		
27	Give one example of osmosis in a plant.		
28	What is active transport?		
29	Why is active transport needed in plant roots?		
30	What is the purpose of active transport in the small intestine?		