Who Am I ?

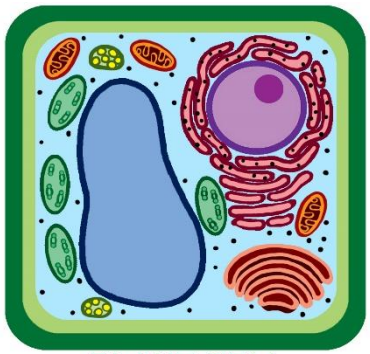
WS 2.9b

Who am I? – Key words

respiration,
sensitivity,
nutrition,
excretion,
nucleus,
cell membrane,
cytoplasm,
chromosome,
cell wall,
chloropla

vacuole,
plasmid,
flagellum,
microscope,
magnification,
focus,
objective
eyepiece,
lens,
specialised

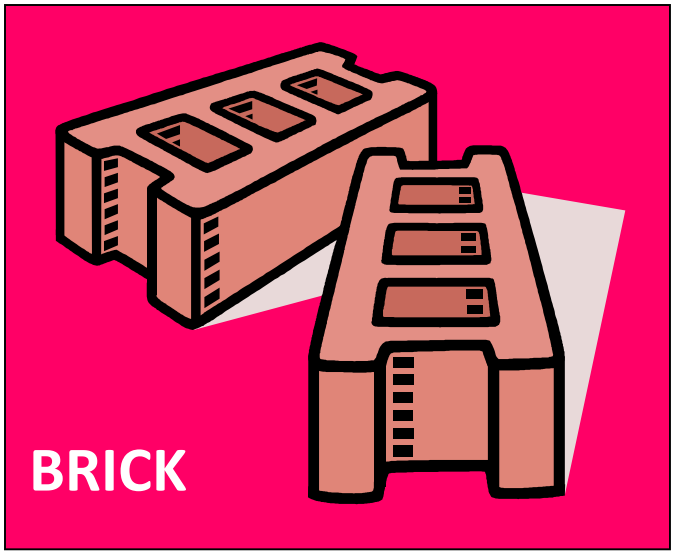
ciliated
epithelial,
palisade,
tissue,
organ,
system,
organism,
hemisphere,
cerebrum,
cerebellum
limbic

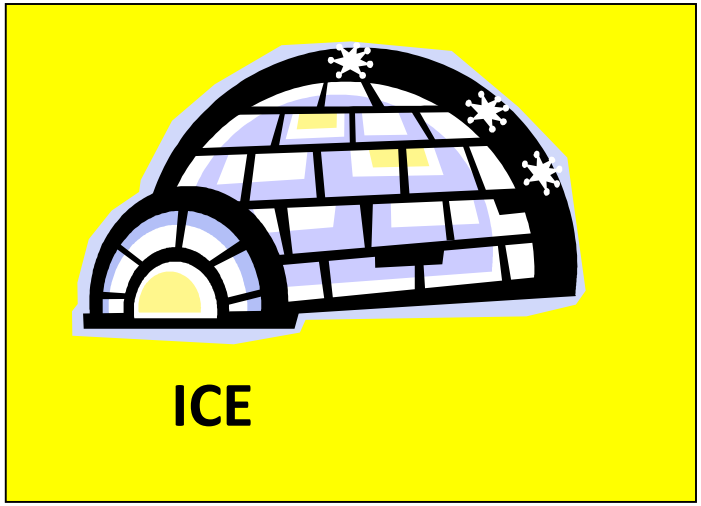

PLANT CELL

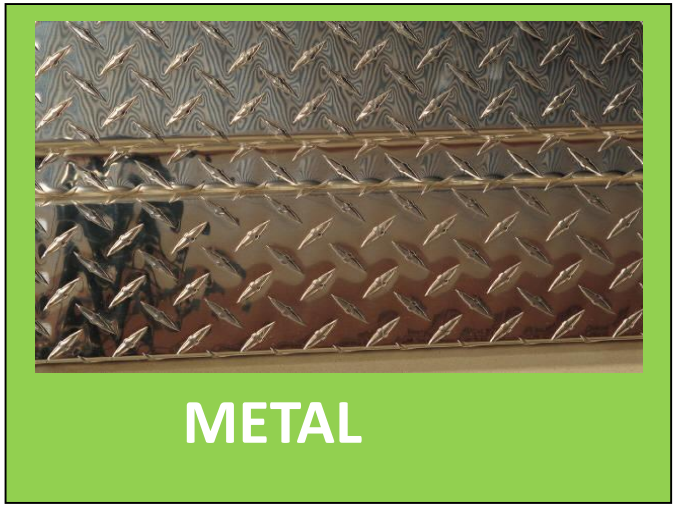
*

Odd One Out

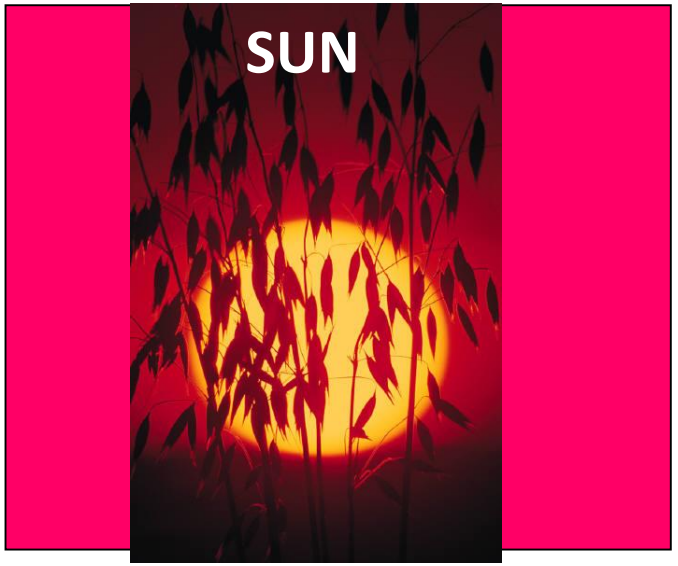

WOOD

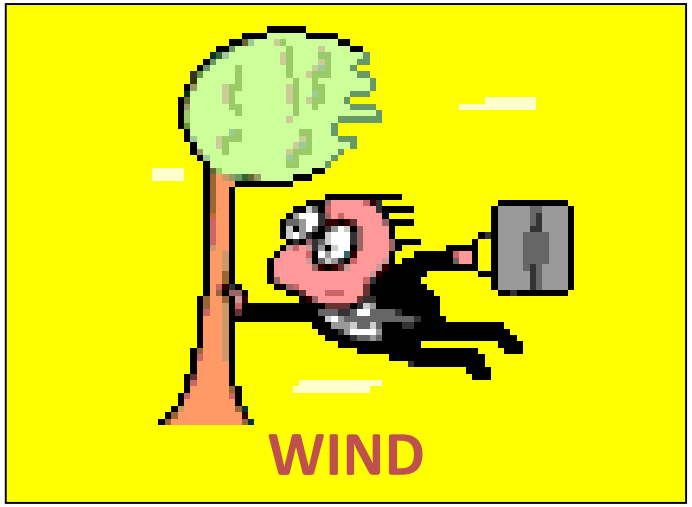

BRICK


ICE


METAL


TREES

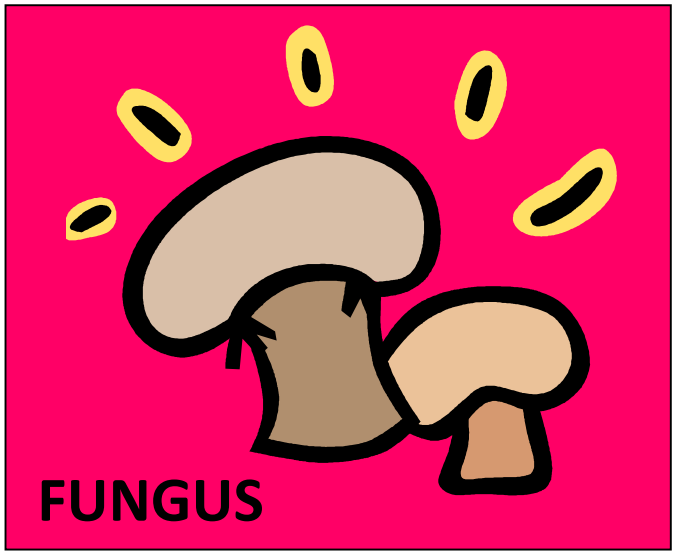

SUN


WIND


FIRE

*

CAT



FUNGUS

LICHEN

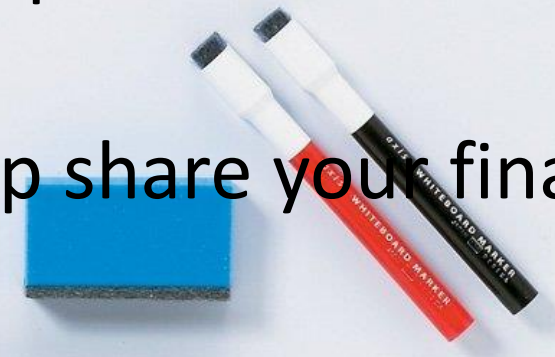
CORAL

KEY QUESTIONS

- What makes something living?
- What do these things allow an organism to do?

On the whiteboard

- List as many things as you can think of that an organism needs to stay alive.
- Share your list with the pupil beside you and make one list.
- Share your list with another pair and make one list.
- One person from each group share your final list with the class.



LEARNING INTENTIONS

- We are learning to identify the characteristics of all living things

SUCCESS CRITERIA

ALL:

- I can list the 7 characteristics of life and
- I can spell them correctly.

MOST:

- I can describe the 7 characteristics of life

SOME:

- I can justify whether an organism is alive using the 7 characteristics of life

There are seven life processes.

MRS NERG

Life process	Definition
Movement	
Reproduction	
Sensitivity	
Nutrition	
Excretion	
Respiration	
Growth	

MOVE NUTRITION

Matching activity

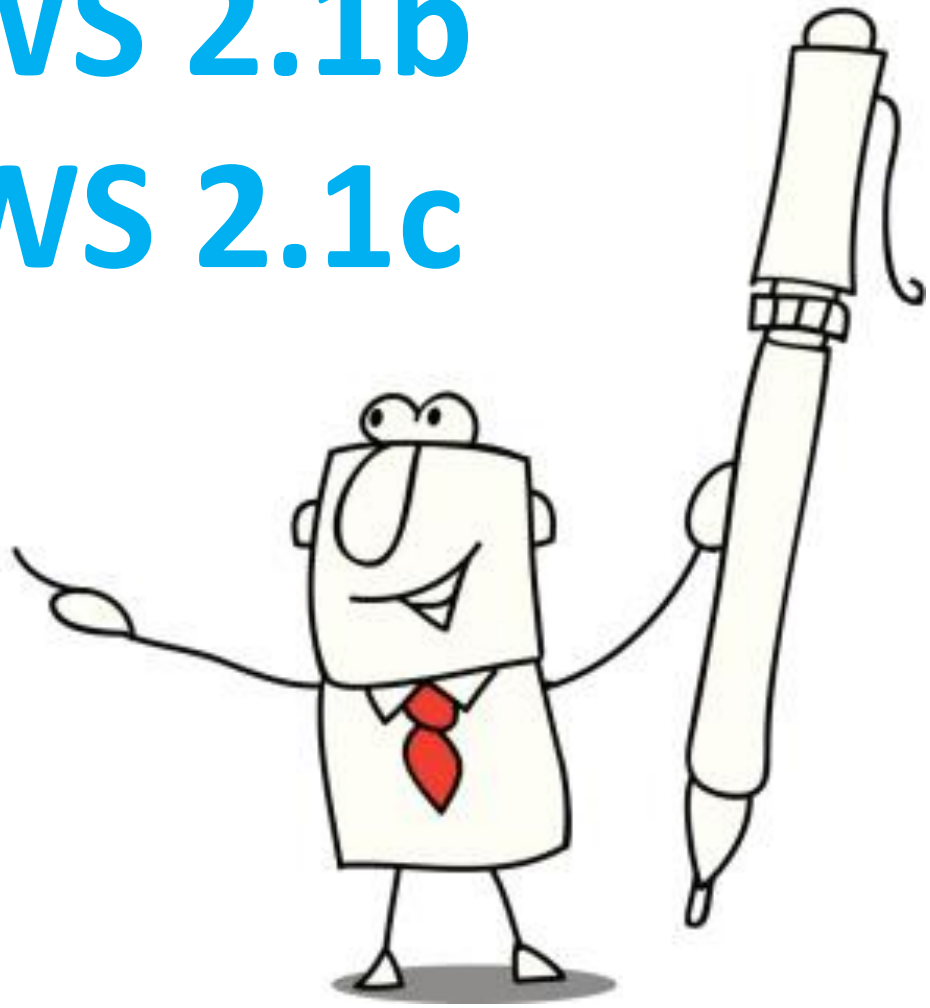
WS 2.1

Life process	Description
Movement	1. Getting rid of waste.
Reproduction	2. All living things move, to find food or a mate and to respond to their environment.
Sensitivity	3. Taking in and using food.
Nutrition	4. Releasing energy from food.
Excretion	5. A permanent increase in size.
Respiration	6. Detecting changes in the surroundings.
Growth	7. Making more living things of the same type.

Matching activity

Life process	Description
Movement	2. All living things move, to find food or a mate and to respond to their environment.
Reproduction	7. Making more living things of the same type.
Sensitivity	6. Detecting changes in the surroundings.
Nutrition	3. Taking in and using food.
Excretion	1. Getting rid of waste
Respiration	4. Releasing energy from food.
Growth	5. A permanent increase in size.

WS 2.1a
WS 2.1b
WS 2.1c



* KEY QUESTIONS

- What are organisms made up of?
- What are the parts of an animal cell, bacterial and plant cell?
- What are their functions?
- What are the similarities and differences between animal and plant cells?
- How are bacterial cells similar to plant and animal cells?
- How are bacterial cells different from plant and animal cells?
- What are the similarities and differences between plant and bacterial cells?

LEARNING INTENTIONS

- We are learning that all living things are made of cells and to distinguish between animal, plant and bacterial cells.

SUCCESS CRITERIA

ALL:

- I can name the structures found in animal, bacterial and plant cells.
- I can correctly spell the structures found in animal, bacterial and plant cells
- I can draw diagrams of animal and plant cells and label the structures they contain.
- I can identify the similarities and differences between animal and plant cells.

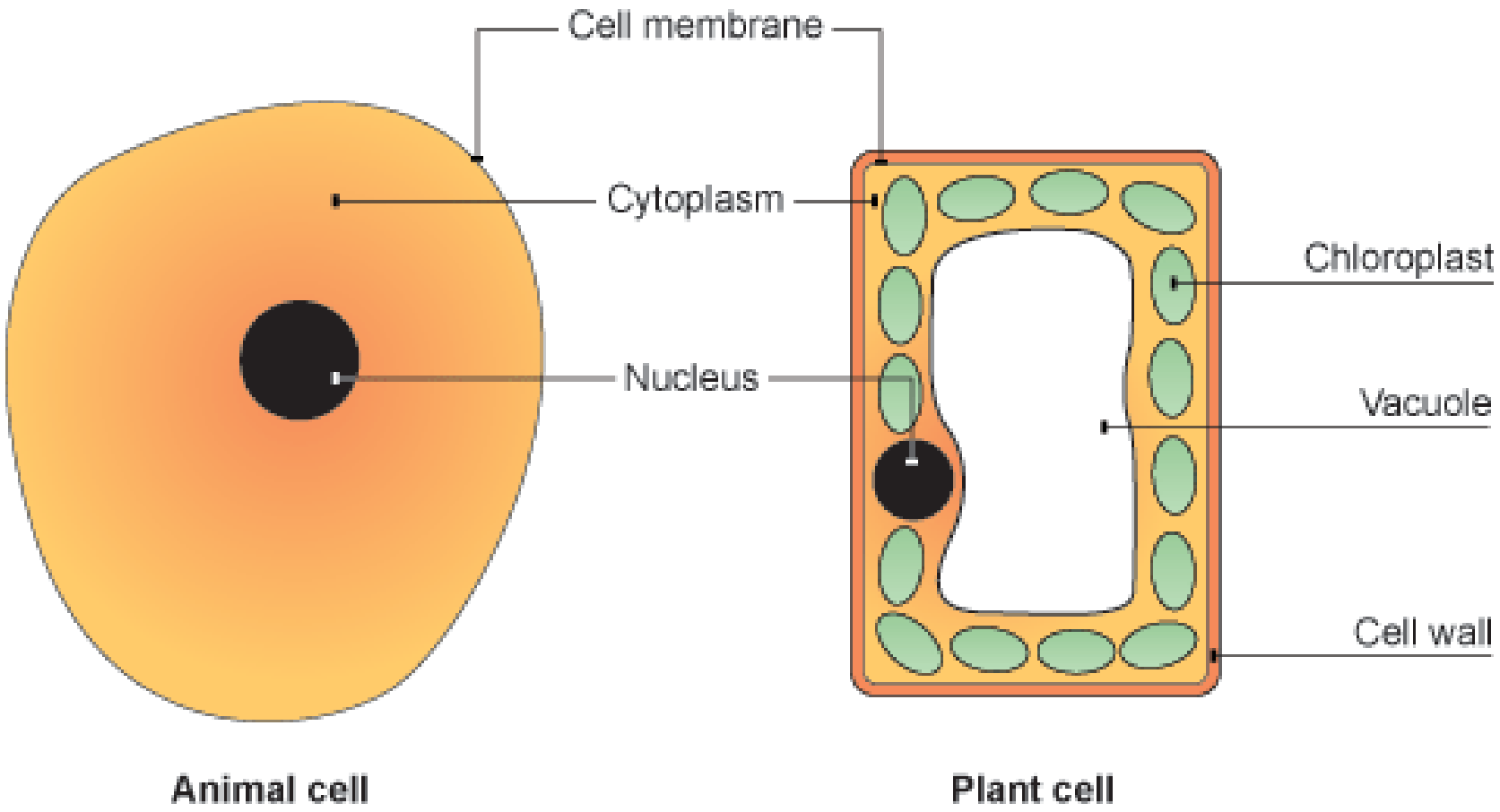
MOST:

- I can draw a diagram of bacterial cell and label the structures it contains.
- I can describe the function of the parts of animal, bacterial and plant cells

SOME:

- I can identify the differences between animal, bacterial and plant cells.
- I can describe the differences in the cell walls of animal, bacterial and plant cells.

BACK TO BACK ACTIVITY


Cell membrane
Cytoplasm
Nucleus
Chloroplast
Vacuole
Cell wall
Animal cell
Plant cell

* Animal cell...

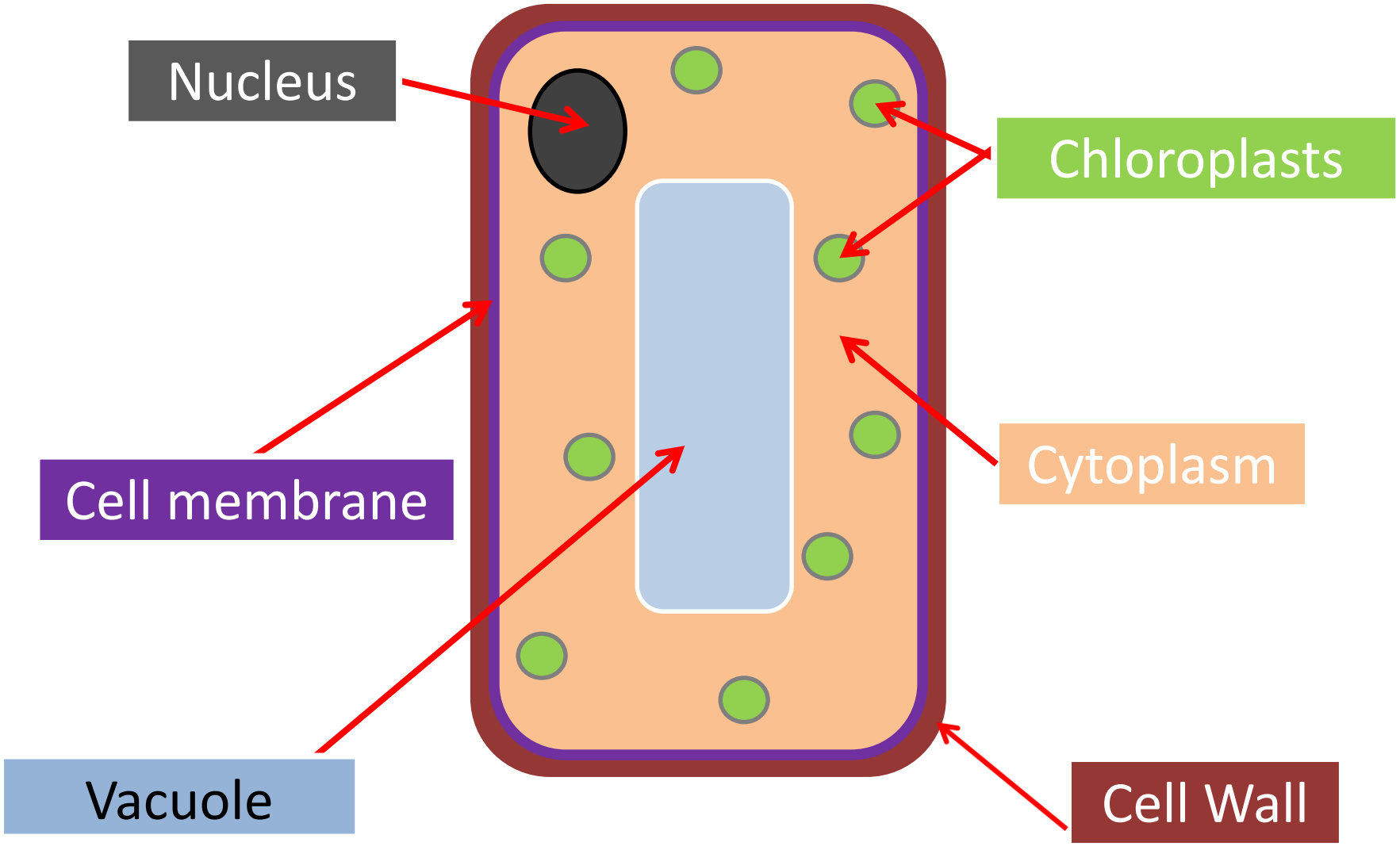
Cell membrane

Nucleus

Cytoplasm

Chromosomes made of DNA are found in the Nucleus

* Plant cell...


Nucleus
Chloroplasts
Cell membrane
Cytoplasm
Vacuole
Cell Wall

Draw a line to match the parts of the cell to the correct cell. Some parts are in both animal and plant cells!

WS 2.2a

Chloroplasts – green structures which contain chlorophyll for photosynthesis.

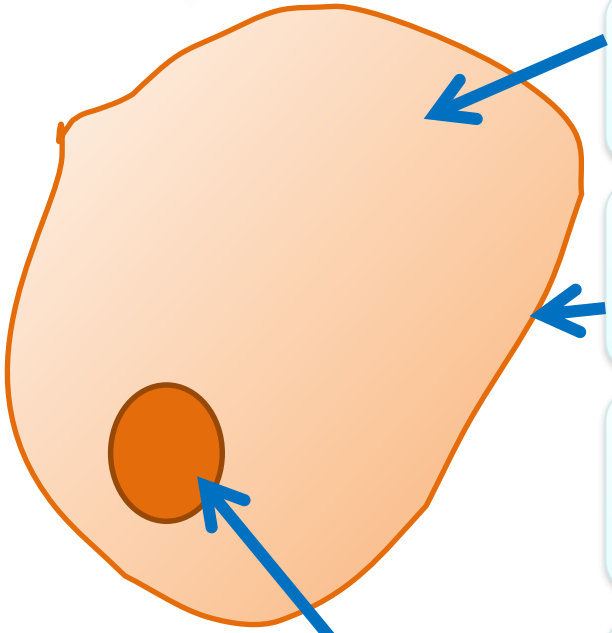
Cytoplasm – where the chemical reactions that go on in the cell happen.

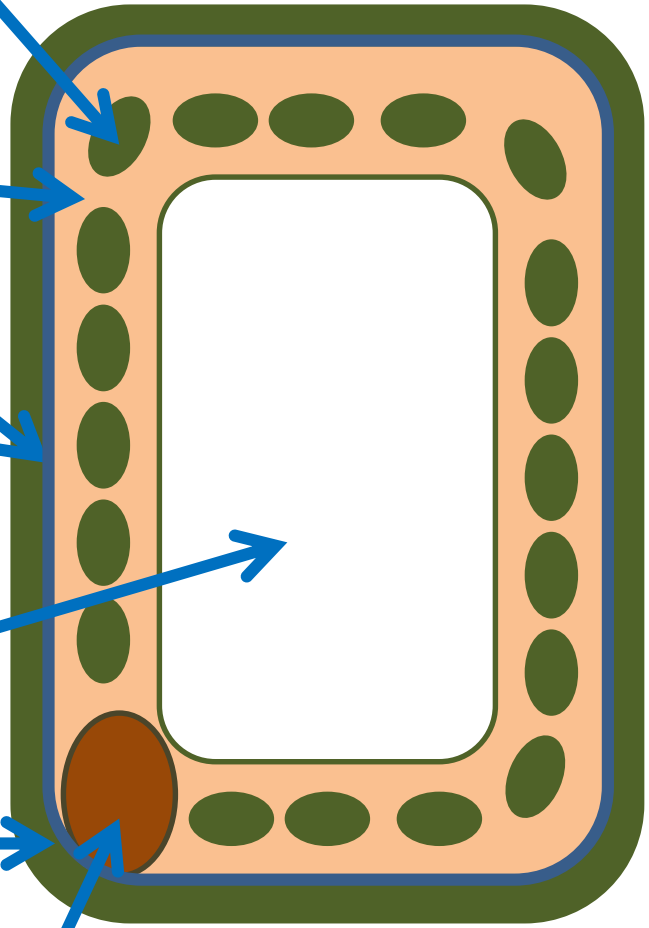
Cell membrane – controls the movement of substances in and out of the cell.

Vacuole – A space inside the cell filled with a watery liquid. This helps the cell to keep its shape.

Cell wall – a tough, supporting structure made of cellulose, found around the outside of a plant cell. It is fully permeable and helps the cell keep its shape.

Nucleus– contains chromosomes, made of DNA. These carry the genetic instructions to make new cells.



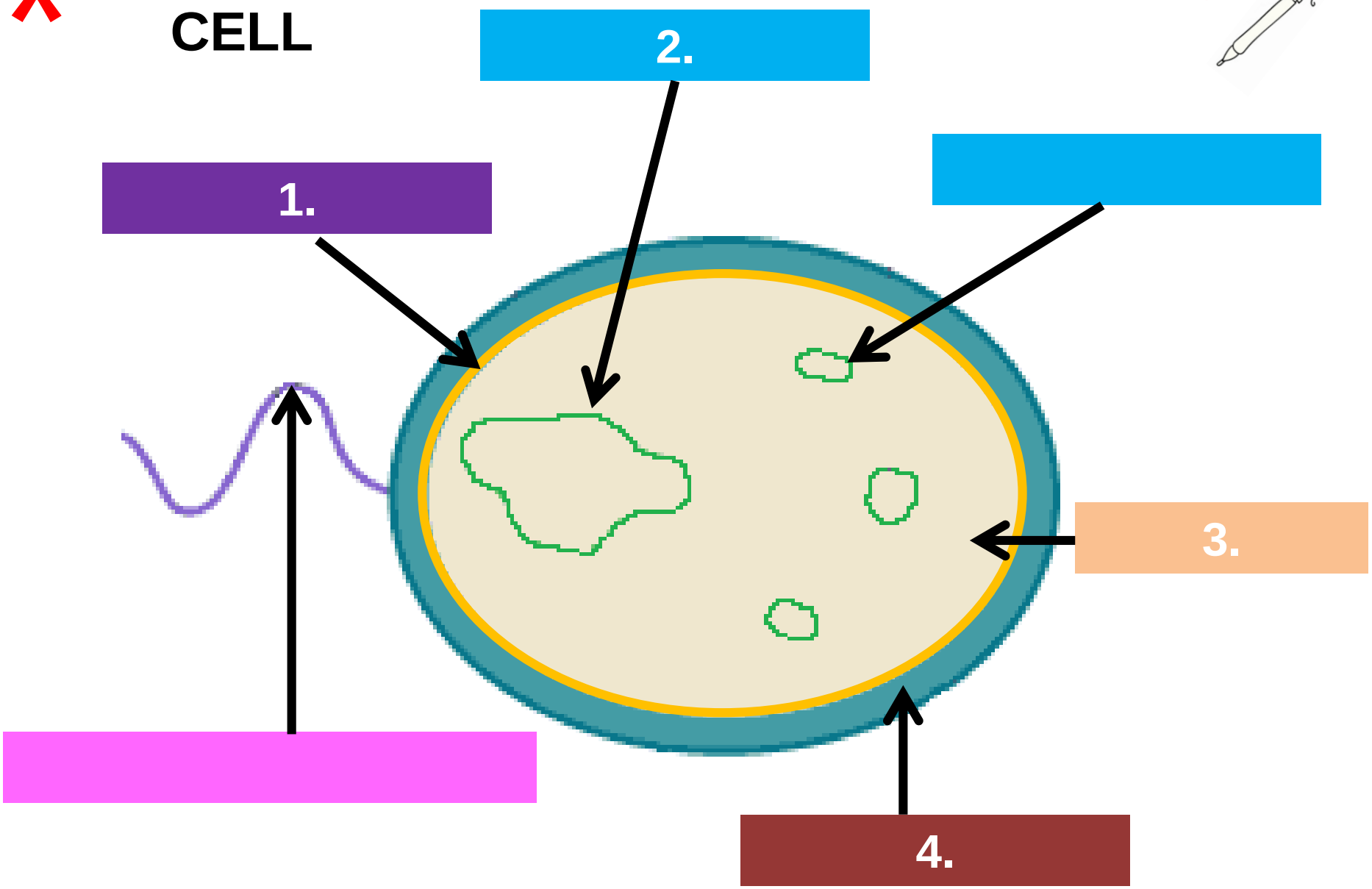


Animal cell

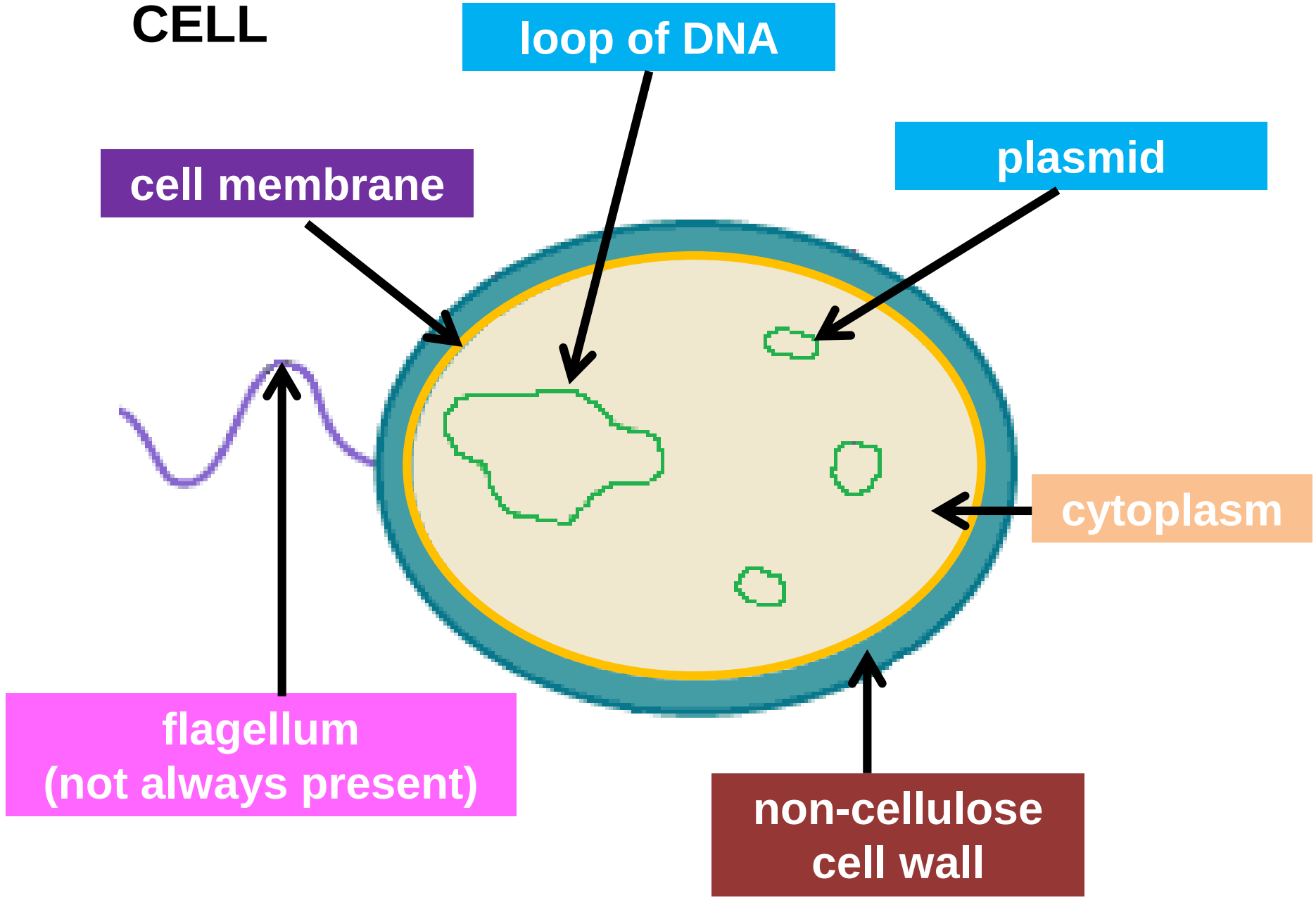
Plant cell

BACTERIAL CELL

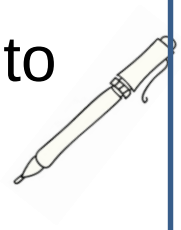
WS 2.2b



BACTERIAL CELL



non-cellulose cell wall	The cell wall supports the cell but isn't made of cellulose like in a plant cell
loop of DNA	There are no nucleus or chromosomes. Their genetic material is found in a large loop in the cytoplasm.
plasmid	A small loop of DNA. There are many in each cell.
flagellum (not always present)	This is used to help the bacterium to move.

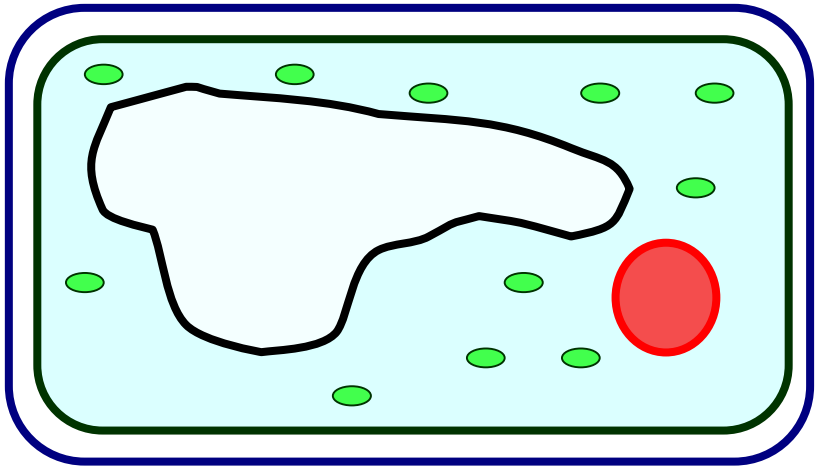


Learn the parts of animal, bacterial and plant cells and what they do.

Learn how to label an animal, bacterial and plant cell.


BEVILLE
DRIVE

You are going to draw a plant cell.



To get the parts of the plant cell you need you must roll a dice.

When you get the number that corresponds to the part, you can draw it into your cell.

To start you must get a 6 for a cell membrane.

Dice Numbers

1 Cell wall

2 Nucleus

3 Vacuole

4 Cytoplasm (shade in)

5 Chloroplast you need 3 of these

6 Cell Membrane

*

AfL Activity

WS 2.3

All	Most	Some	A Few
Sort the names of the parts of the cell into animal, bacterial or plant cell.	Match the functions of the parts of the animal, bacterial and plant cell. Sort them into the appropriate boxes.	Sort the similarities and differences between animal, bacterial and plant cells.	List the similarities and differences between animal, bacterial and plant cells.

ALL

- Cell membrane
- Cell wall
- Chloroplast
- Chromosome
- Cytoplasm
- Nucleus
- Plasmid
- Vacuole
- Loop of DNA

ANIMAL

BACTERIA

PLANT

ALL answers

- Cell membrane
- Cell wall
- Chloroplast
- Chromosome
- Cytoplasm
- Nucleus
- Plasmid
- Vacuole
- Loop of DNA

ANIMAL

- Cell membrane
- Chromosome
- Nucleus
- Cytoplasm

BACTERIA

- Cell membrane
- Cell wall
- Loop of DNA
- Plasmid
- Cytoplasm

PLANT

- Cell membrane
- Cell wall
- Chloroplast
- Chromosome
- Cytoplasm
- Vacuole
- Nucleus

MOST

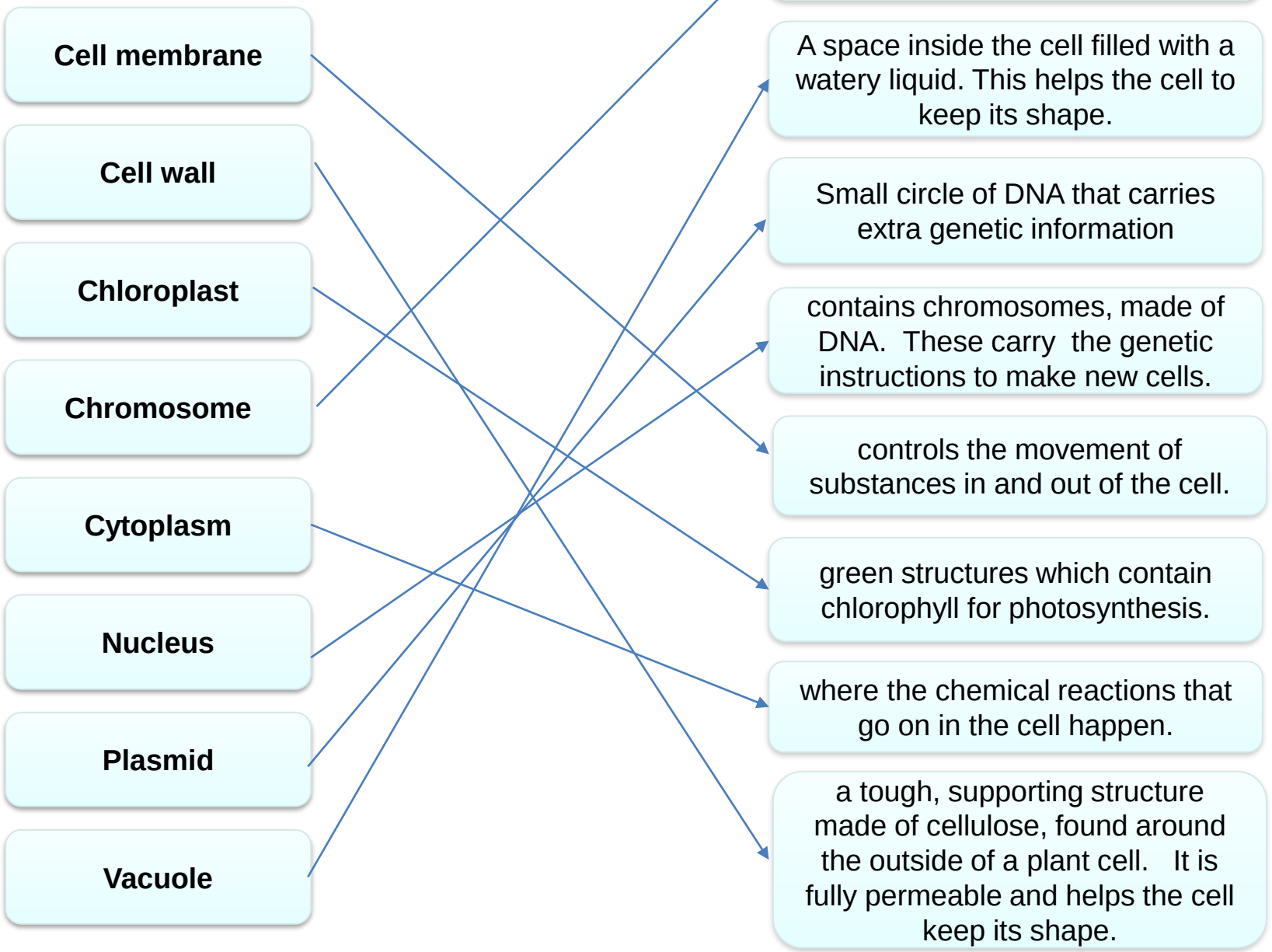
Cell membrane	Carries most of the genetic information
Cell wall	A space inside the cell filled with a watery liquid. This helps the cell to keep its shape.
Chloroplast	Small circle of DNA that carries extra genetic information
Chromosome	contains chromosomes, made of DNA. These carry the genetic instructions to make new cells.
Cytoplasm	controls the movement of substances in and out of the cell.
Nucleus	green structures which contain chlorophyll for photosynthesis.
Plasmid	where the chemical reactions that go on in the cell happen.
Vacuole	a tough, supporting structure made of cellulose, found around the outside of a plant cell. It is fully permeable and helps the cell keep its shape.

MOST

answers

Cell membrane	controls the movement of substances in and out of the cell.
Cell wall	a tough, supporting structure made of cellulose, found around the outside of a plant cell. It is fully permeable and helps the cell keep its shape.
Chloroplast	green structures which contain chlorophyll for photosynthesis.
Chromosome	Carries most of the genetic information
Cytoplasm	where the chemical reactions that go on in the cell happen.
Nucleus	contains chromosomes, made of DNA. These carry the genetic instructions to make new cells.
Plasmid	Small circle of DNA that carries extra genetic information
Vacuole	A space inside the cell filled with a watery liquid. This helps the cell to keep its shape.

MOST answers



SOME

- Cell membrane
- Cell wall
- chloroplast
- chromosome
- Loop of DNA
- Nucleus
- Plasmid
- Vacuole

ANIMAL & PLANT & BACTERIA

ANIMAL & PLANT

BACTERIA & PLANT

SOME answers

- Cell membrane
- Cell wall
- Chloroplast
- Chromosome
- Cytoplasm
- Nucleus
- Plasmid
- Vacuole

ANIMAL & PLANT & BACTERIA

- Cell membrane
- Cytoplasm

ANIMAL & PLANT

- Cell membrane
- Cytoplasm
- Nucleus
- Chromosome

BACTERIA & PLANT

- Cell membrane
- Cytoplasm
- Cell wall

*A FEW

ANIMAL & PLANT & BACTERIA

ANIMAL & PLANT

BACTERIA & PLANT

1. What is the function of a chloroplast?
2. Where would you find the cell wall in a plant cell?
3. Name TWO features that are found in both animal and plant cells.
4. Which part of a cell controls the movement of substances in and out of the cell?
5. Where in a cell do chemical reactions take place?
6. Where would you find chromosomes?
7. How is the genetic material of an animal cell different to a bacterial cell?
8. Name one structure that is found in bacterial cells but not animal or plant cells.

1. What is the function of a chloroplast?
   Trap energy from the Sun/ carry out photosynthesis/ make food for the plant
2. Where would you find the cell wall in a plant cell?
   Outside the cell membrane
3. Name TWO features that are found in both animal and plant cells.
   Nucleus/ chromosomes; cytoplasm; cell membrane;
4. Which part of a cell controls the movement of substances in and out of the cell? Cell membrane
5. Where in a cell do chemical reactions take place? Cytoplasm
6. Where would you find chromosomes?
   In the nucleus/ plant & animal cells
7. How is the genetic material of an animal cell different to a bacterial cell?
   Loop shaped not straight / in the cytoplasm not a nucleus
8. Name one structure that is found in bacterial cells but not animal or plant cells.
   plasmid; non-cellulose cell wall; flagellum; loop of DNA

*

KEY QUESTIONS

- What is the function of the microscope?
- What parts of the microscope does this?
- How do you calculate the magnification of a microscope?
- Why do you always view a slide at low power to start?

LEARNING INTENTIONS

- We are learning how to use a microscope to view prepared specimens.

SUCCESS CRITERIA

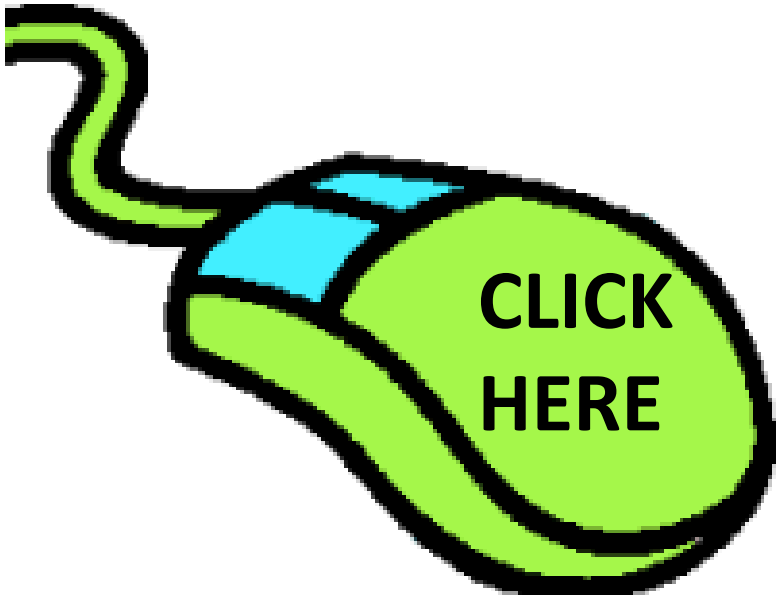
ALL:

- I can name the parts of a microscope.
- I can carry the microscope safely and turn it on.
- I can correctly focus and view a slide under low power.
- I can calculate the magnification of a slide.

MOST:

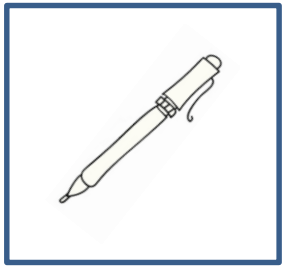
- I can correctly focus and view a slide under high power.
- I can draw a diagram of a slide at high power

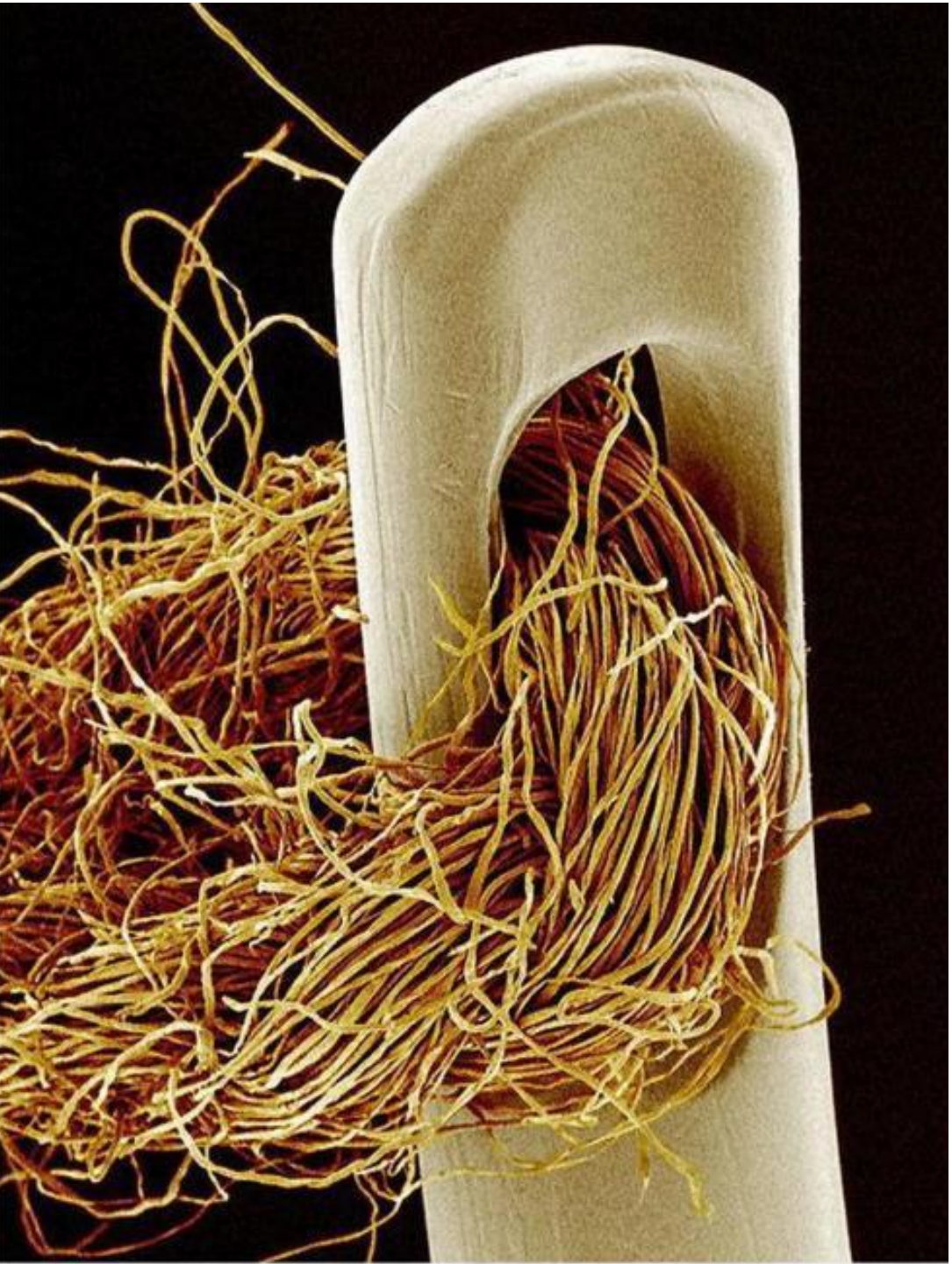
CELL THEORY & THE MICROSCOPE



Function of the microscope

- The microscope allows us to view objects that cannot be seen with the naked eye
- It uses lenses to produce a magnified image.





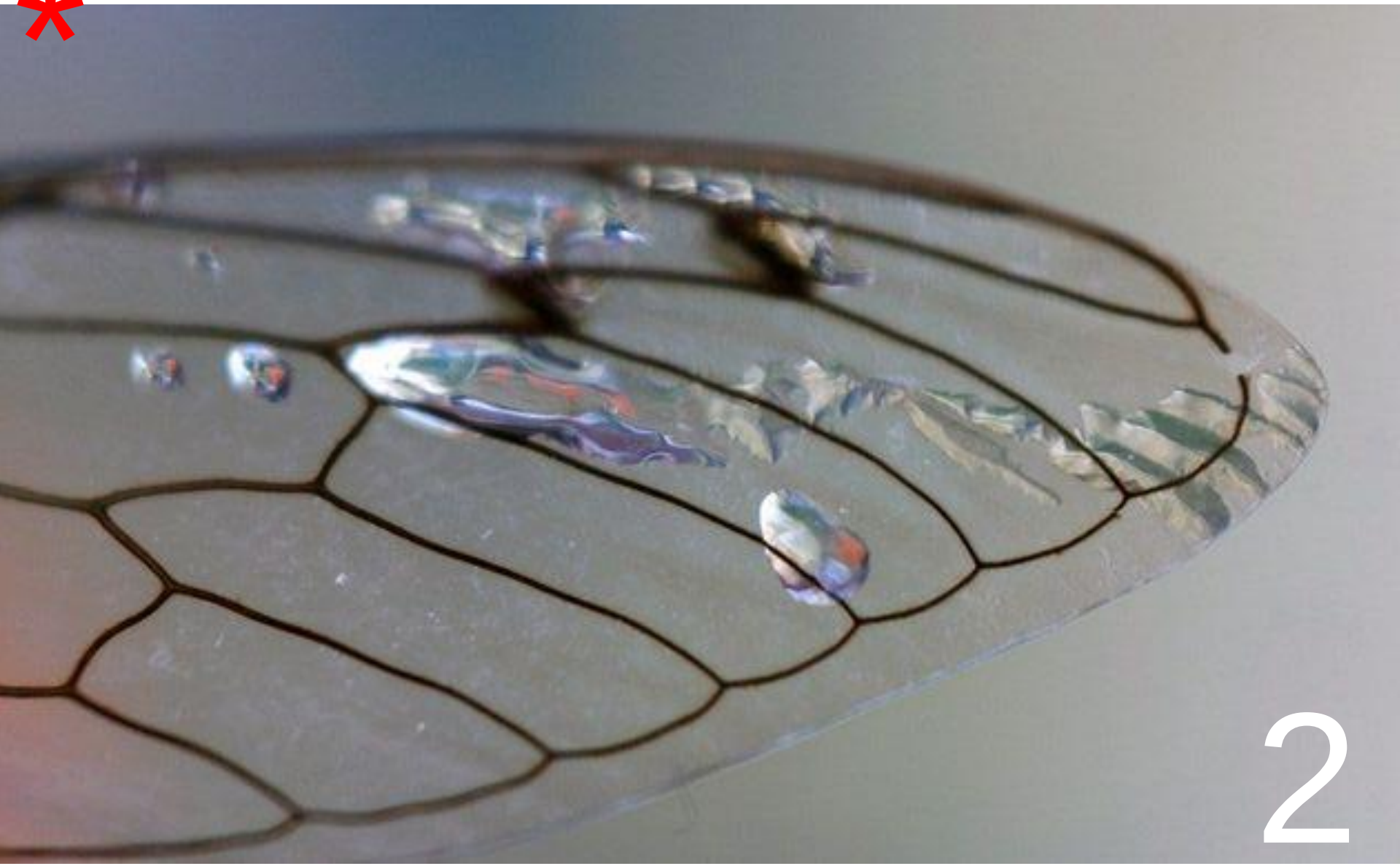
PAIRED ACTIVITY

The objects on the next 9 slides have been magnified using a light microscope.

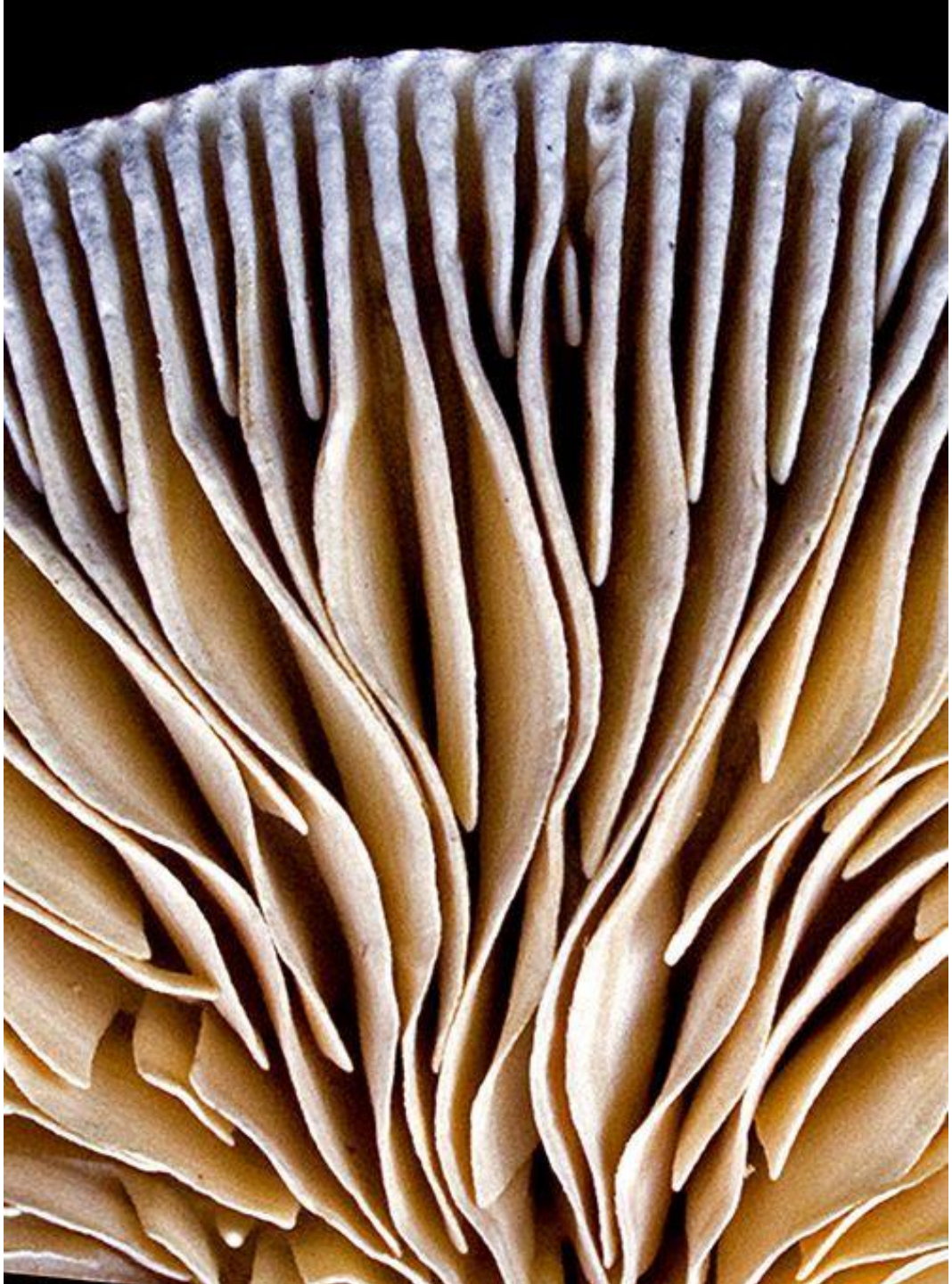
Look carefully at each and use a whiteboard to name object.

Your teacher may time you!

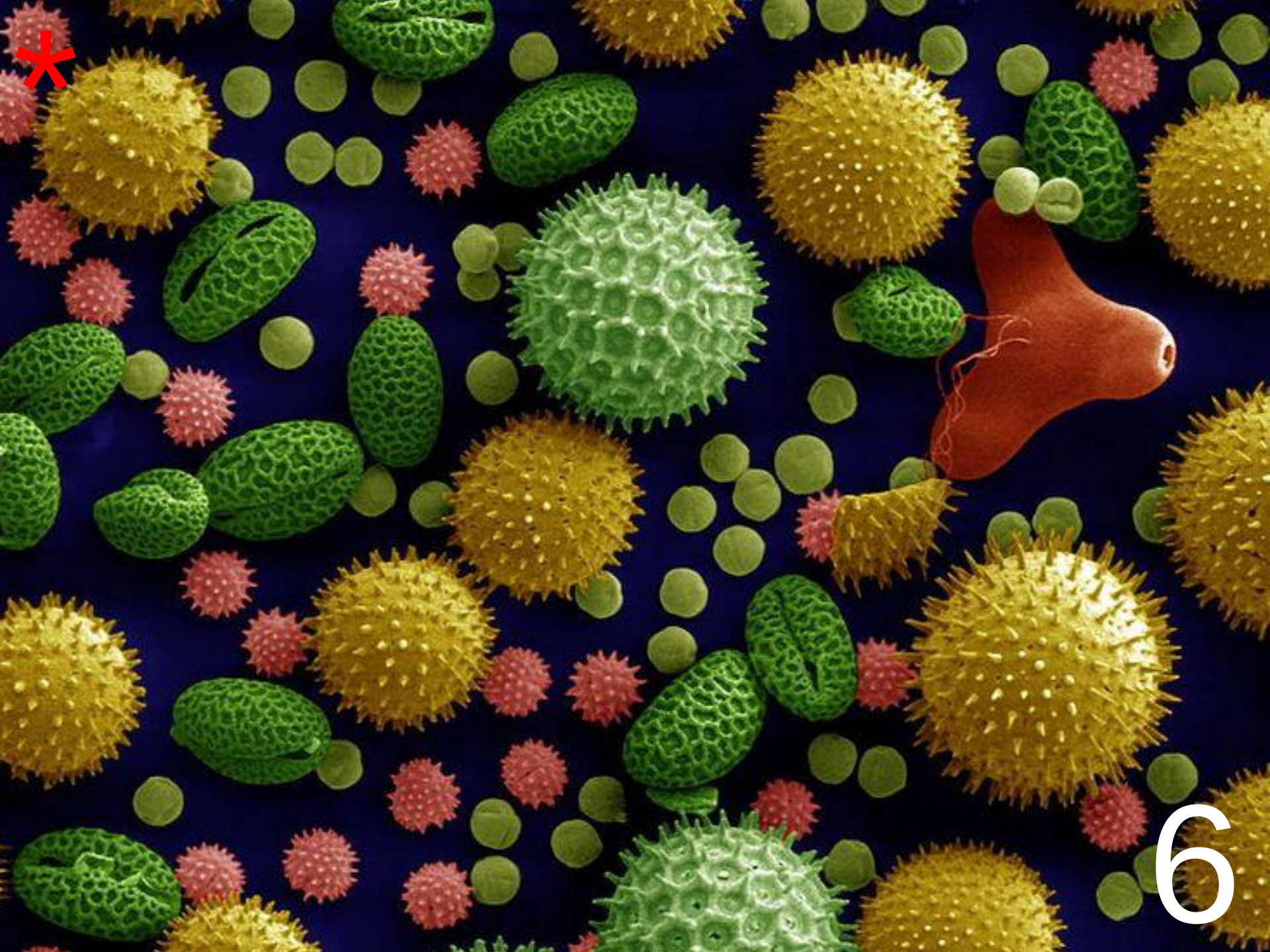

*
© nikola

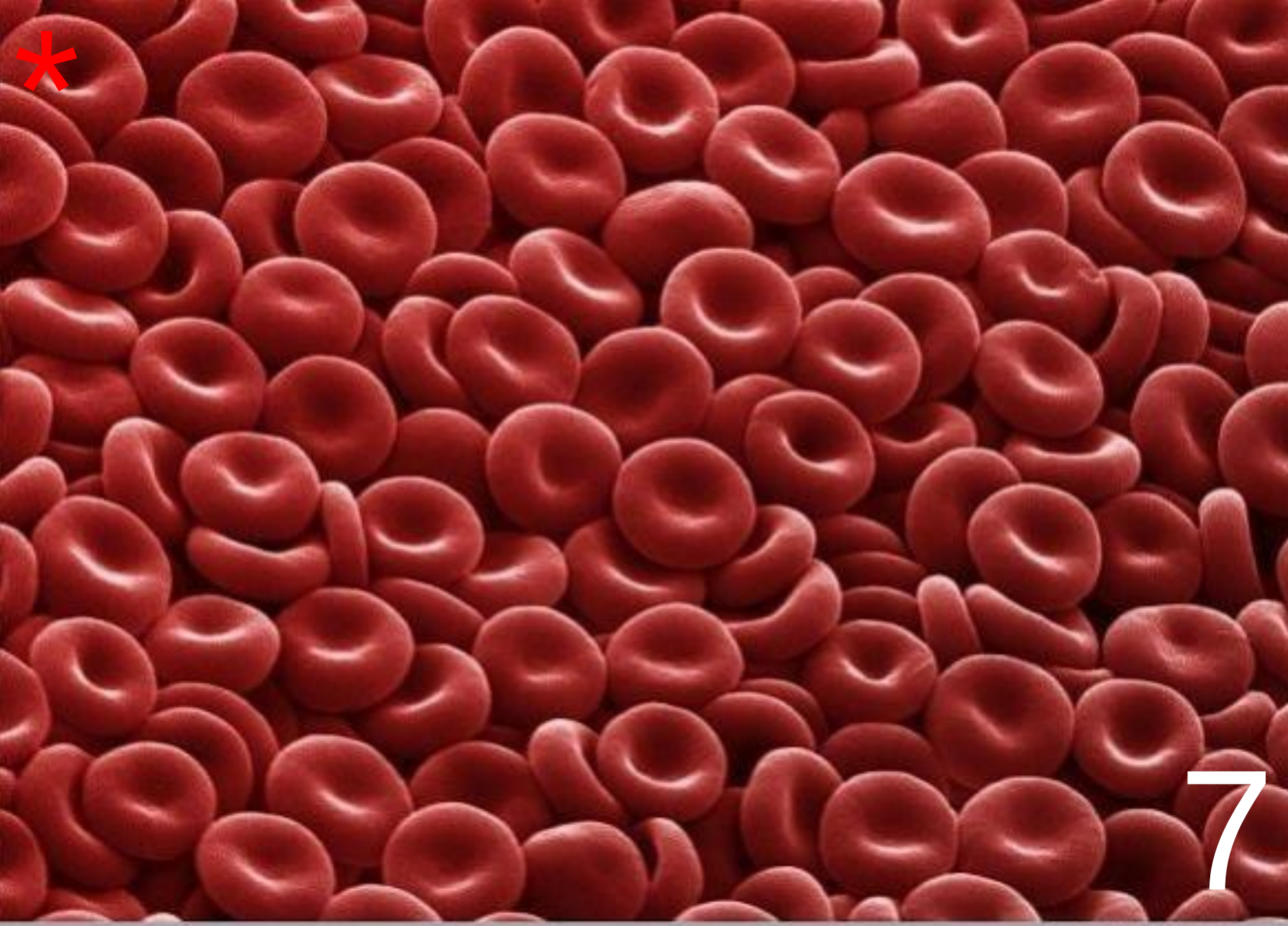

2


*
3




5
SCIENCEphotoLIBRARY

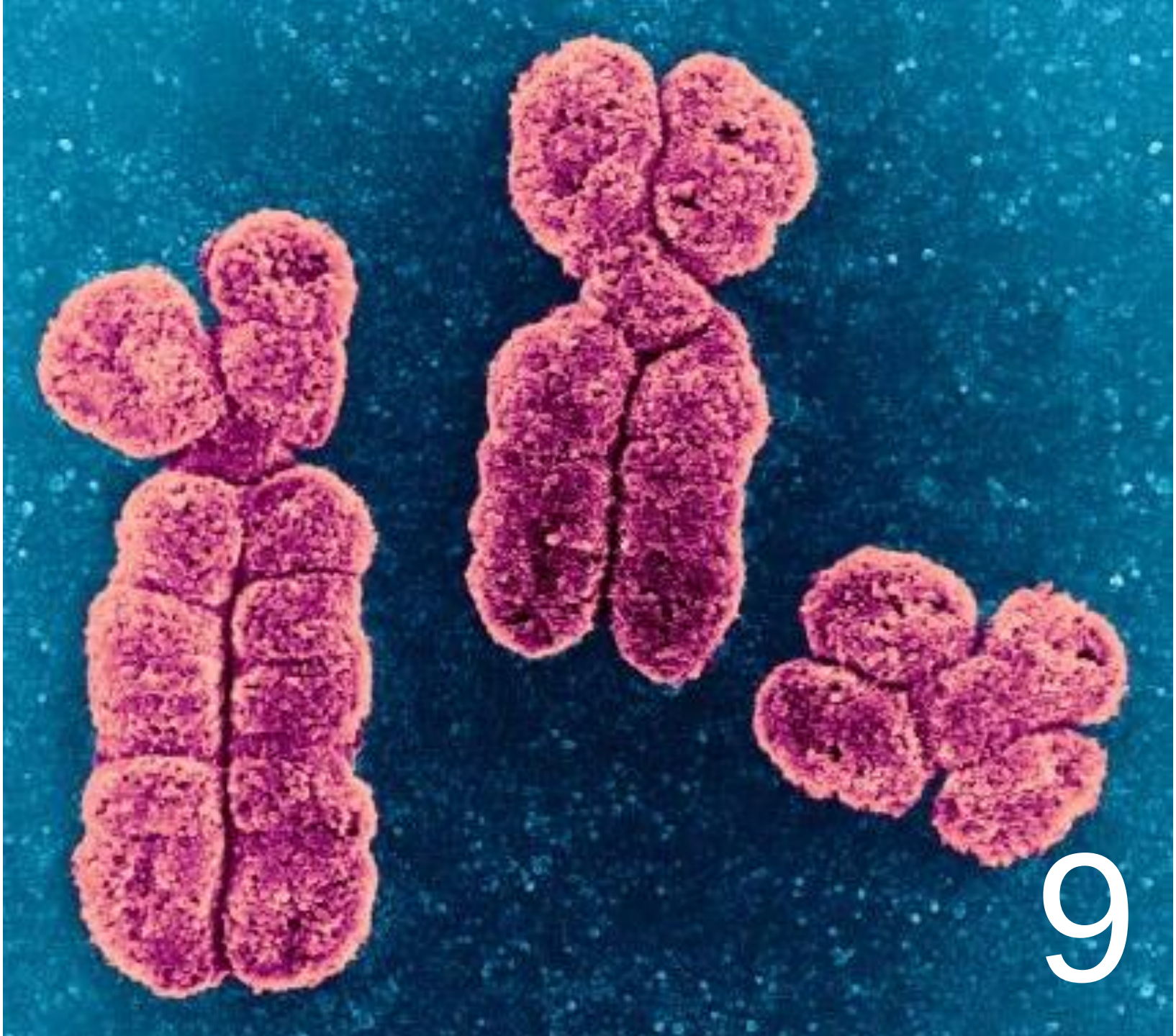




7

Wellcome Image

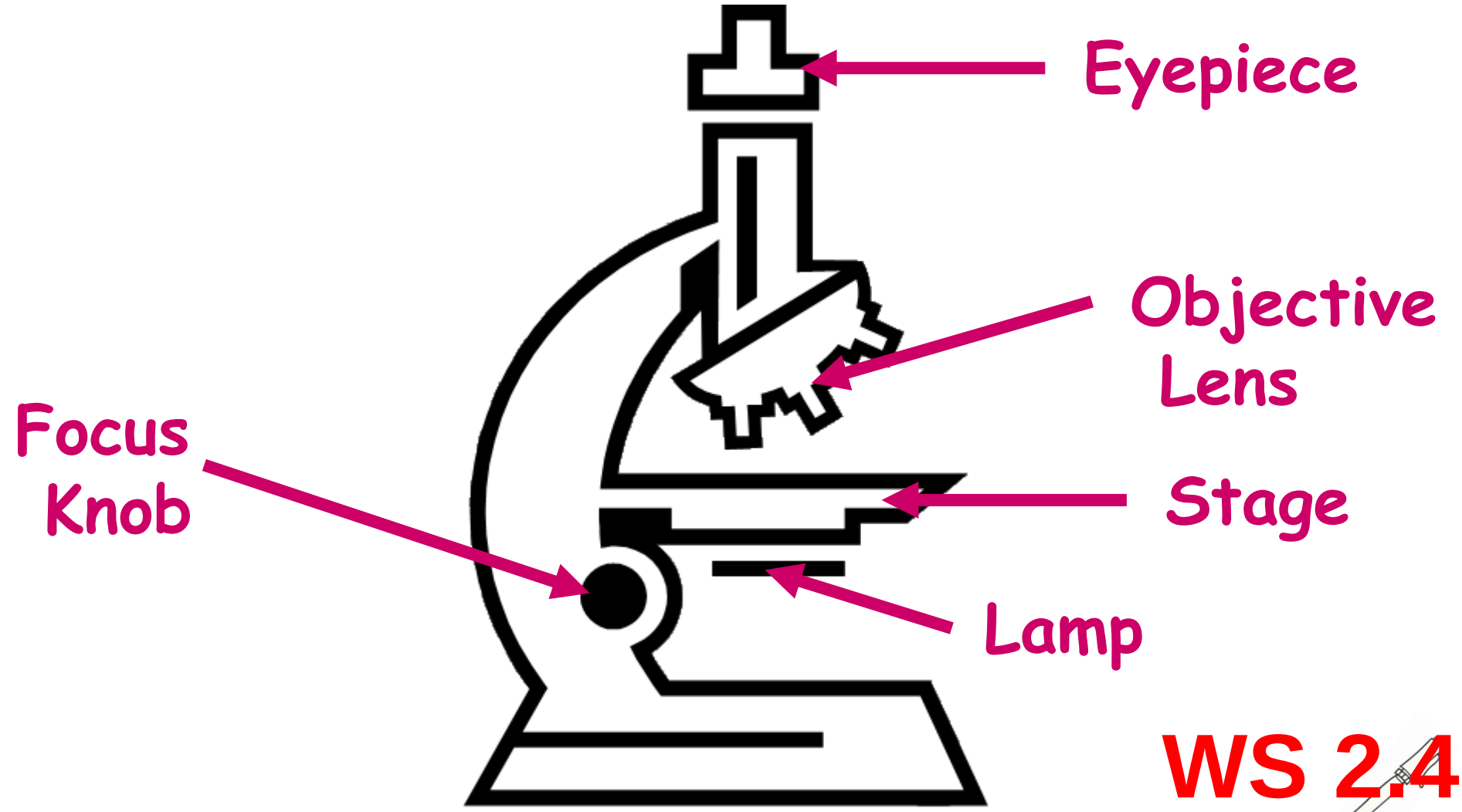
*


9

ANSWERS

1. Scales on a moth wing (many cells)
2. Dragonfly wing (many cells)
3. Cauliflower (many cells)
4. Gills of a mushroom (many cells)
5. Anvil, small bone in the ear (many cells)
6. Pollen grains (individual cells) from different plants
7. Red blood cells (individual cells)
8. Fertilised fish eggs (many cells)
9. Chromosomes (part of a cell)

Parts of the Microscope



WS 2.4

Step 1: Plug in and turn on the microscope

Step 2: Rotate the **low power objective lens** into place.

Step 3: Place the slide on the **stage**.
Centre the specimen over the hole in the stage.
Secure the slide with the **stage clips**.

Step 4: Use the **focus knob** to move the stage up as far as it will go towards the objective lens.

Step 5: Look through the **eyepiece** and turn the focus knob **slowly away from you** until the image of the specimen comes clearly into focus.

Step 6: Move the slide to locate other areas of the specimen.

Move the slide left to move the image to the right and movie it down to move the image up.

Step 7: Move the slide to place the object you want to view in the centre of the field of view and rotate the **medium power objective lens** into place.

Move the focus knob **very slowly** away from you to focus the image.

Step 8: To view another slide you must move the stage down as far as it will go, remove the original slide and rotate the low power objective lens into place.

Repeat stages 3-7.

Step 9: When completed turn off the microscope and unplug it.
Remove the slide from the stage.
Rotate the lower power objective lens into place.
Wind the lead around the microscope and replace the cover.

REMEMBER TO ALWAYS START WITH THE LOW POWER LENS

- to locate the part of the specimen that you want to view
- to avoid breaking the slide or lens as you move the stage

View a selection of prepared slides:

- Muscle
- Spinal cord
- Pollen grains
- Spirogyra
- Euglena
- Hydra

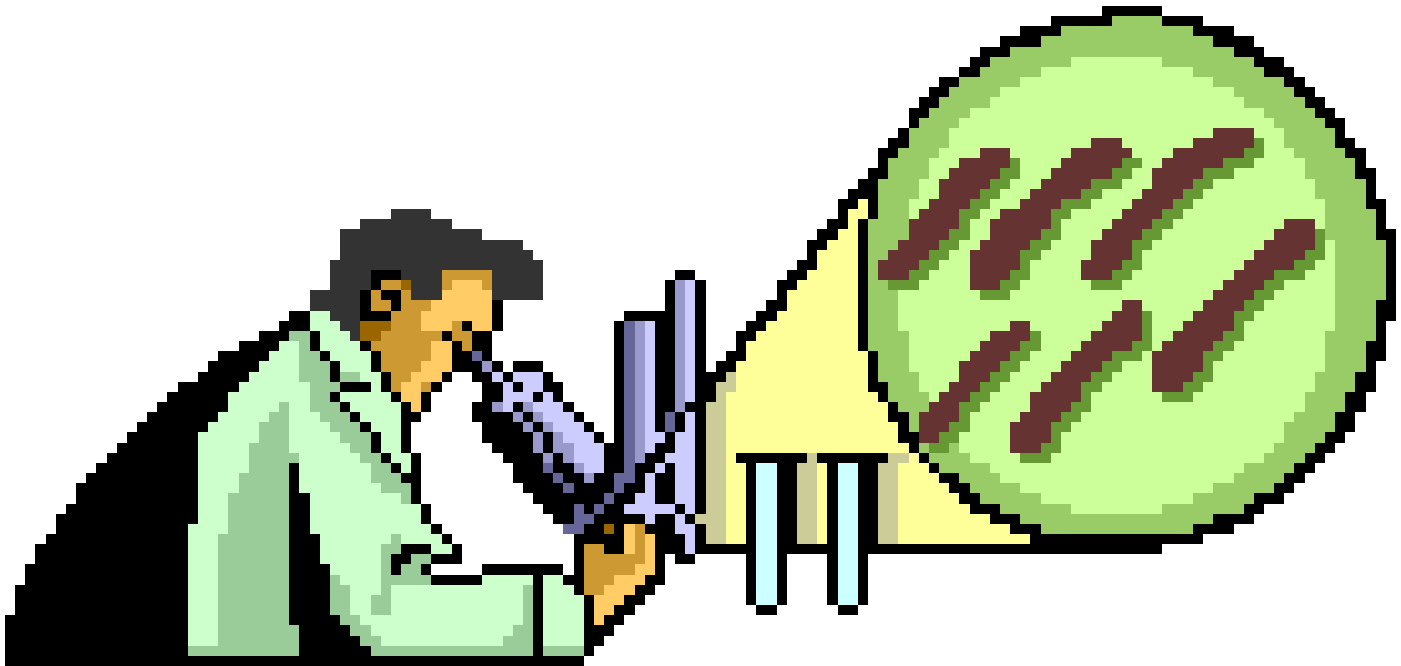
View the following under the microscope by sellotaping them to the centre of a clean microscope slide:

- Hair
- Fluff from your blazer or jumper

YOU MUST GET YOUR TEACHER TO CHECK AT LEAST ONE OF YOUR SLIDES ONCE IT IS IN FOCUS.

MAGNIFICATION

Total image magnification = eye piece magnification x objective lens magnification



How much is a red blood cell magnified when it is viewed using the X10 eyepiece and X40 objective lens.

Total image magnification = eye piece magnification x objective lens magnification

Total image magnification = 10 x 40

Total image magnification = X400

*

KEY QUESTIONS

- Why is onion epidermis used to view onion cells?
- Why are stains added to the onion epidermis and cheek cells?
- Why is it important to reduce the number of air bubbles on a slide?

LEARNING INTENTIONS

- We are learning how to make microscope slides of onion tissue and cheek cells.

SUCCESS CRITERIA

ALL:

- I follow instructions to collect onion tissue and cheek cells.
- I can place onion tissue and cheek cells correctly onto a clean microscope slide.
- I can add the correct stain to the onion tissue and cheek cells

MOST:

- I can carefully place a coverslip on my slide, minimising air bubbles.

Looking at Onion Cells

WS 2.5

1. Clean a microscope slide.
2. Place an onion on a white tile and carefully use a scalpel to cut a 1cm X 1cm section.
3. Use a pair of tweezers to carefully peel off a thin layer of epidermis from the onion section.
4. Use tweezers to lay the membrane in a single flat layer in the middle of the microscope slide.
5. Use a dropper to place two drops of iodine onto the onion epidermis.
6. Carefully lower a coverslip over the onion using a mounted needle.
7. View the slide under low power and then at high power.

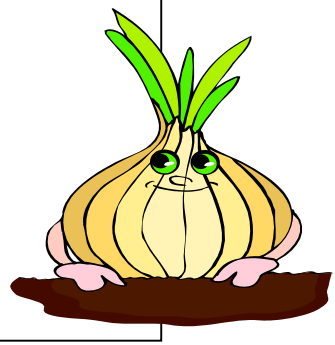
Using a mounted needle to slowly lower the coverslip helps to prevent trapping air and forming air bubbles. These will look like thick black circles under the microscope.

Iodine solution helps to stain the onion cells making them easier to see.

ACTIVITY

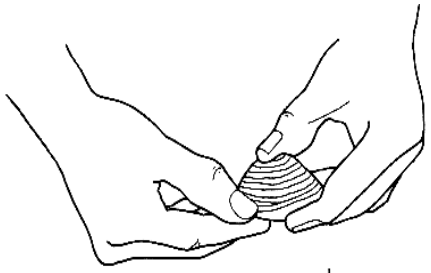
Using the high power lens find one onion cell and draw a **LARGE** diagram in the box below. You should:

- Give your diagram a title
- Write down the magnification used when you drew the onion cells
- Identify and label any structures which you can make out on your cell.

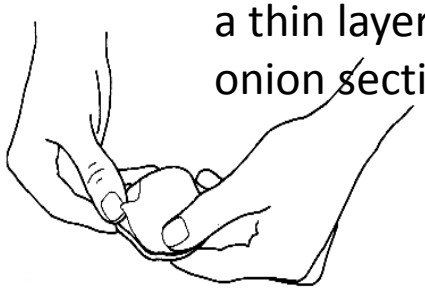


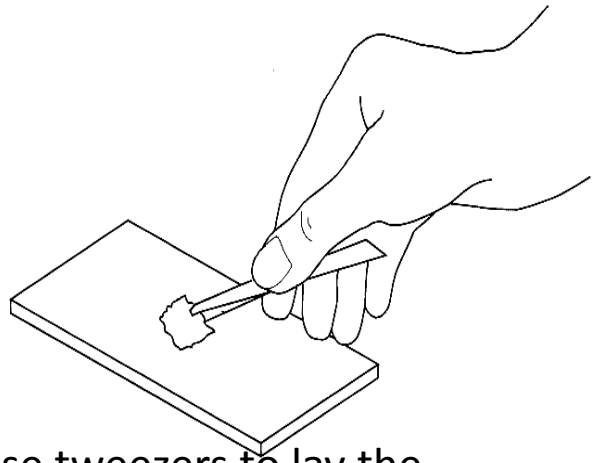
MAKING AN ONION SLIDE WS 2.5

1) Clean a microscope slide.
2) Place an onion on a white tile and carefully use a scalpel to cut a 1cm X 1cm section.



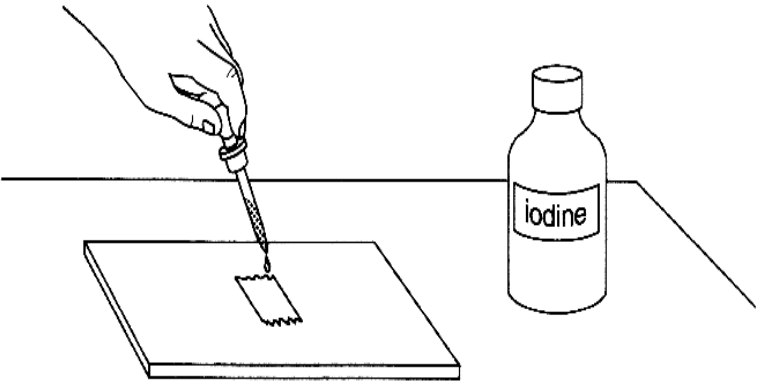
3) Use tweezers to carefully peel off a thin layer of epidermis from the onion section.



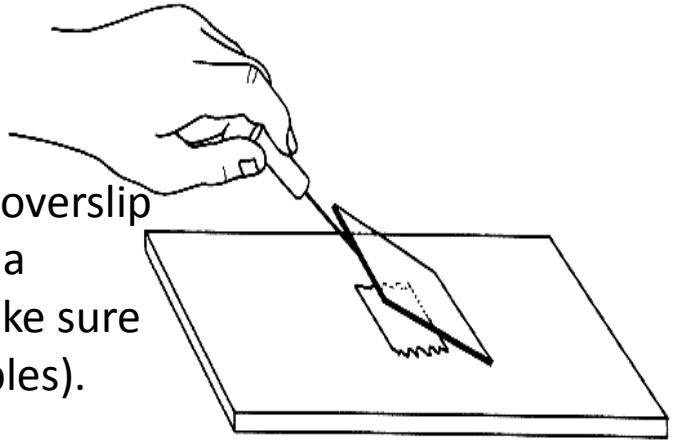


4) Use tweezers to lay the membrane in a single flat layer in the middle of the microscope slide.

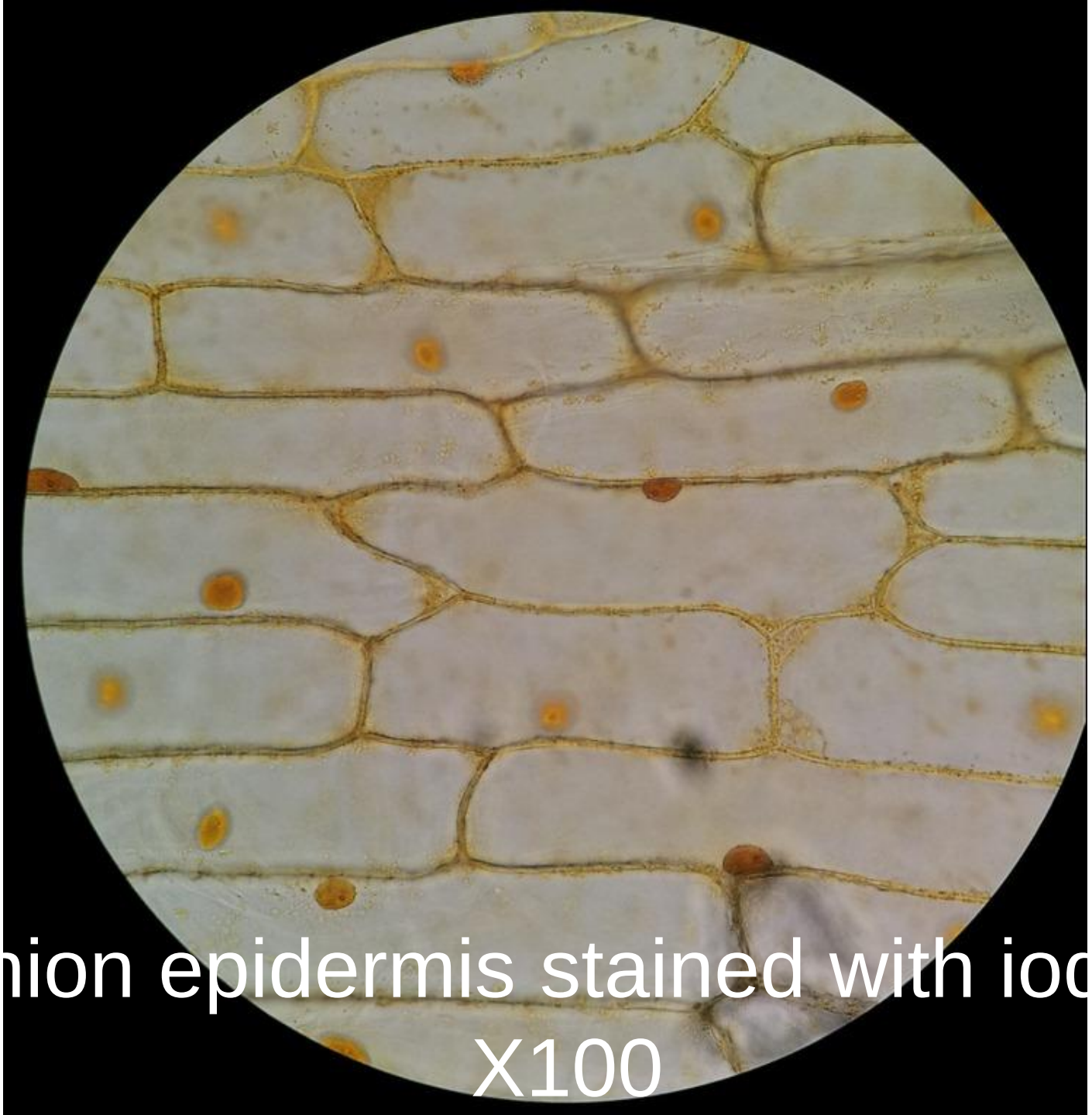
5) Use a dropper to place two drops of iodine onto the onion epidermis.



6) Carefully lower a coverslip over the onion using a mounted needle (make sure there are no air bubbles).



Air bubbles X40



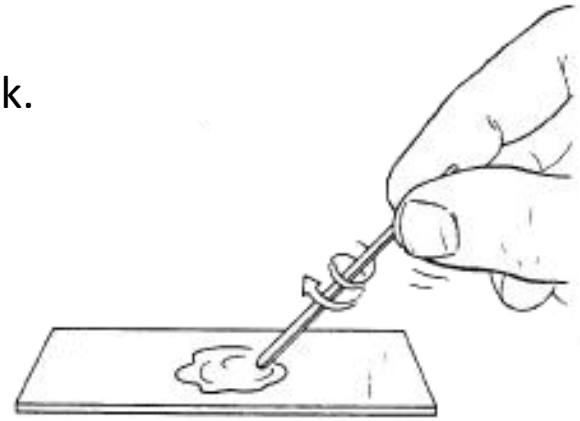
nion epidermis stained with iod
X100

ACTIVITY

- Using the high power lens find one onion cell and draw a **LARGE** diagram in the box below. You should:
- Give your diagram a title
- Write down the magnification used when you drew the onion cells
- Identify and label any structures which you can make out on your cell.

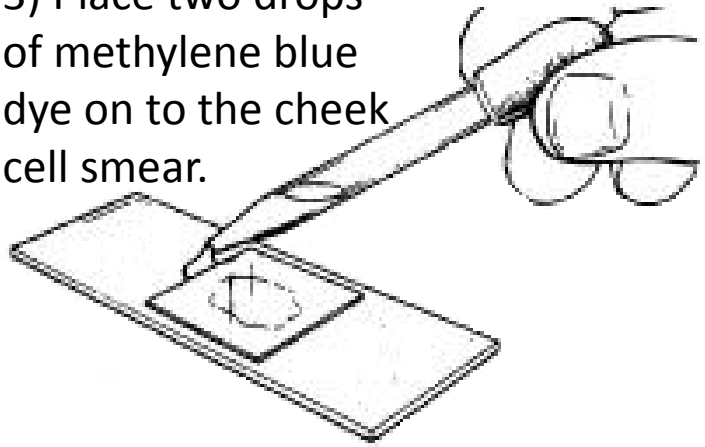
MAKING A CHEEK CELL SLIDE

1) Use a clean cotton bud to swab the inside of your cheek.

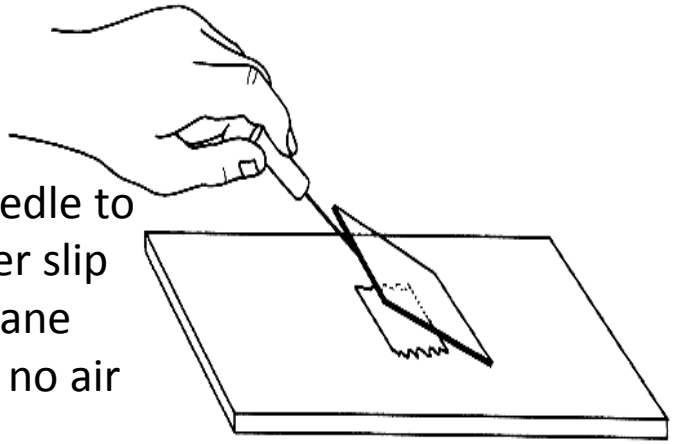


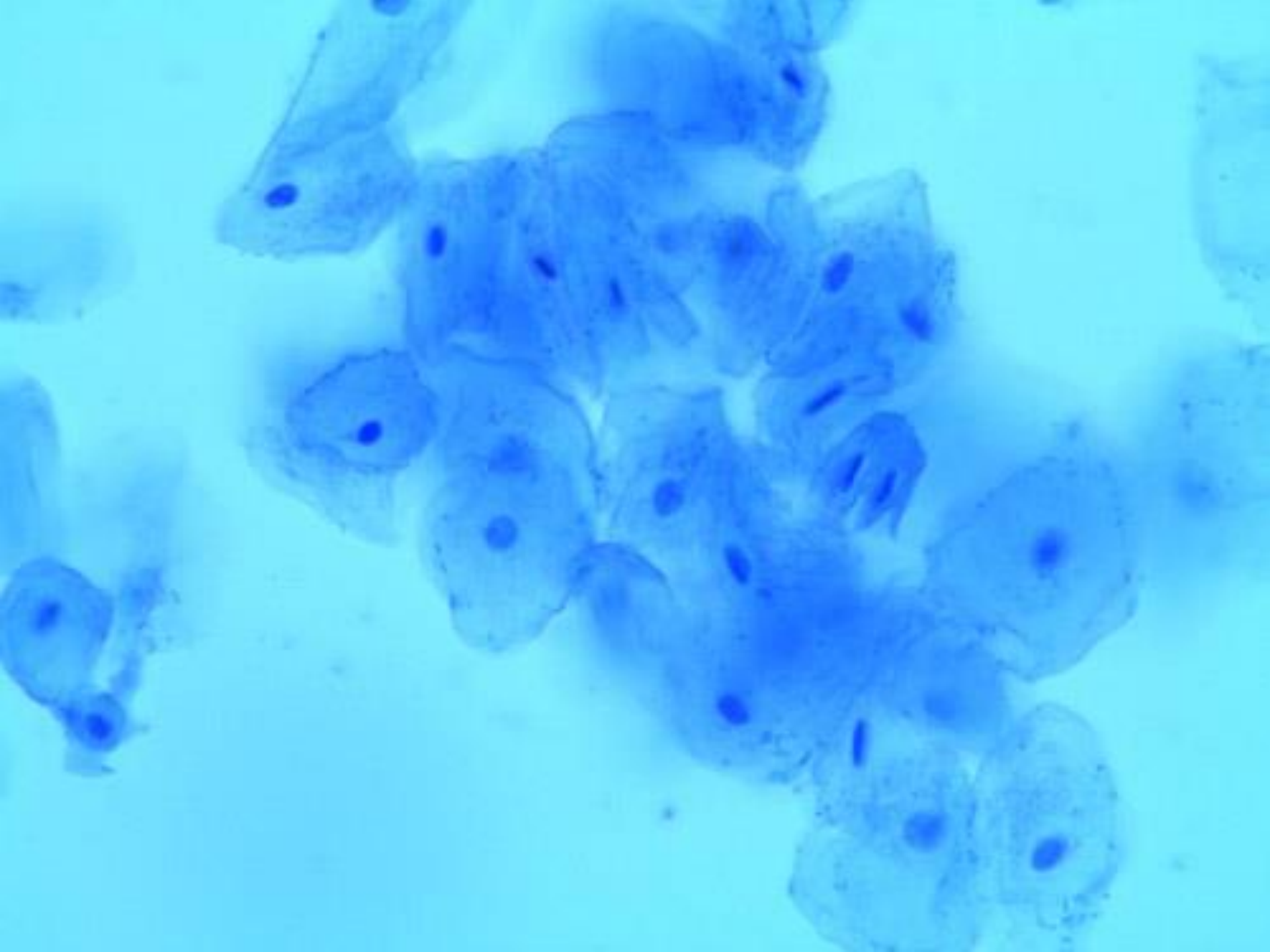
2) Rub the cotton bud onto the centre of a clean microscope slide

3) Place two drops of methylene blue dye on to the cheek cell smear.

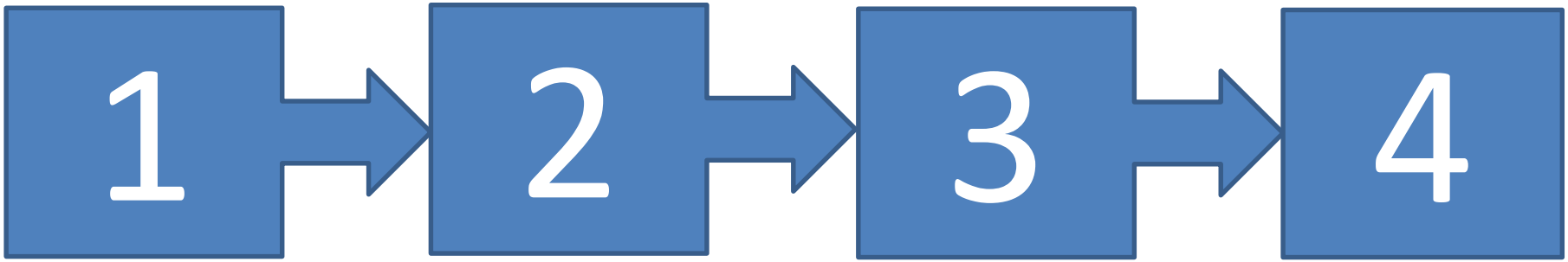


4) Use a mounted needle to carefully lower a cover slip on top of the membrane (make sure there are no air bubbles).





Draw a flow chart to describe the steps used to prepare a cheek cell slide.



What is the difference between onion and cheek cells?

- Onion cells have a cell wall, cheek cells don't
- Onion cells have a vacuole, cheek cells don't
- Onion cells have chloroplasts, cheek cells don't

*

Scientific Eye: Cells

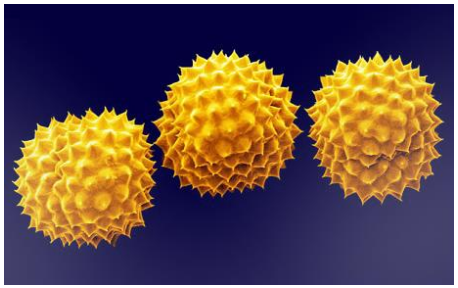
- https://youtu.be/T0BdCtBU3Dk

Write down on a post it:

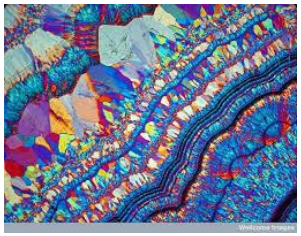
2 things you didn't know

1 thing you want to find out more about

Embryologist
Used to view cell development during IVF treatment.



Forensic scientist
Examines physical evidence collected from crime scenes, including hair, blood and skin samples, pieces of clothing and other personal belongings that might help law enforcement solve crimes.

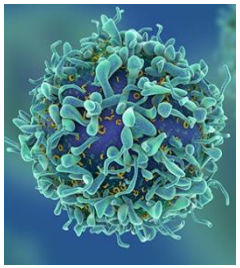


Geologist
Determines the chemical composition of rocks

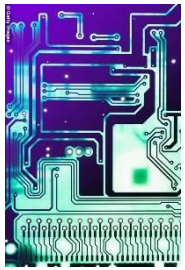
Cardiac Surgeon
Putting stents into arteries in the heart

microscopy

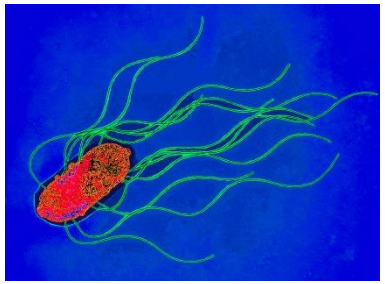
Pathologist
analyse tissue samples under a microscope to determine the presence of diseases that cause death.



Oncologist
Identifying cancer cells



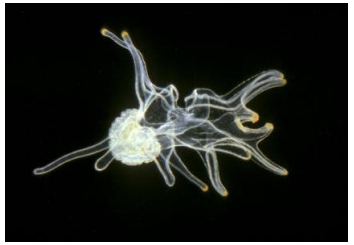
Microchip technologist
Develops microchips



Microbiologist
Identify bacteria and other microorganisms that cause disease so they can be treated correctly.

Which job would interest you most? Why?

Can you think of any other jobs that might use microscopes?



Marine biologist
Studies plankton to investigate marine food webs

*

KEY QUESTIONS

- Can you place the 3 types of cells in the correct order from smallest to largest.
- How many mm in a m?
- How many μm in a mm?
- How do you change m to mm?
- How do you change mm to μm?

LEARNING INTENTIONS

- We are learning to calculate the size of cells.

SUCCESS CRITERIA

ALL:

- I can convert metres to millimetres

MOST:

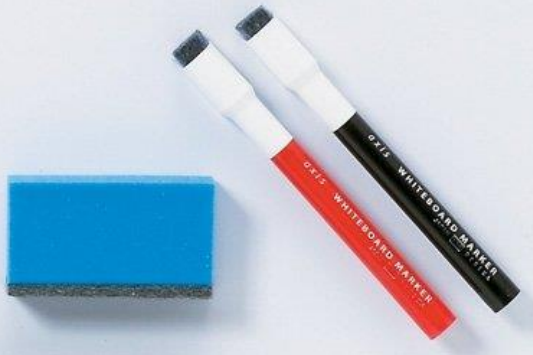
- I can convert millimetres to micrometres

SOME:

- I can calculate the size of a cell in micrometres

On the whiteboard

- List animals, bacterial and plant cells in their correct size order, starting with the smallest.
- Watch the animation.

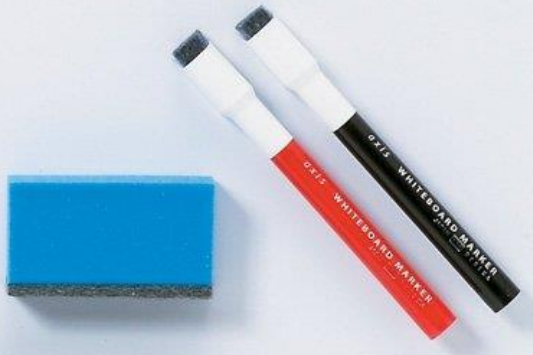


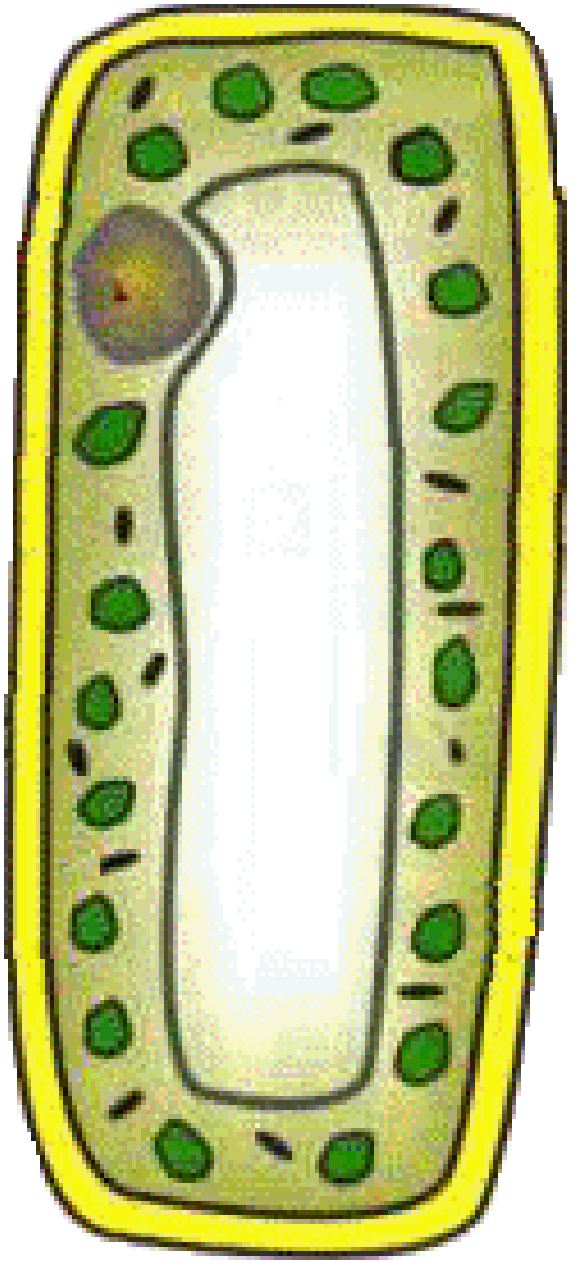
How big are cells?

http://www.cellsalive.com/howbig.htm

On the whiteboard

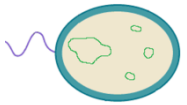
- Were you correct?
- bacterium, animal, plant





Comparing cell sizes:

- plant cell approximately 0.05mm
- animal cell approximately 0.02mm
- bacterial cells approximately 0.005mm



Cells are so small that they are measured in micrometres rather than millimetres

1 metre = 1 000 millimetres

1m = 1 000 mm

1 millimetre = 1 000 micrometres

1 mm = 1 000 μm

*An animal cell is 0.02 mm long

1mm = 1 000 μm

0.02mm = 0.02 x 1 000 μm

= 20 μm

ACTIVITY:

Use whiteboards to calculate the size of a plant and a bacterial cell in micrometres.

Plant cell is 0.05 mm

1mm = 1 000 μm then

0.05mm = 0.05 x 1 000 μm

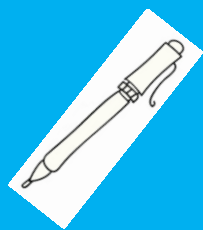
= 50 μm

Bacterial cell is 0.005 mm

1mm = 1 000 μm then

0.005mm = 0.005 x 1 000 μm

= 5 μm



KEY QUESTIONS

- Why are cells specialised?
- What are cell adaptations?
- How are specific cells adapted to carry out their functions?

LEARNING INTENTIONS

- We are learning to describe how specialised cells are adapted to carry out their function.

SUCCESS CRITERIA

ALL:

- I can name examples of specialised animal and plant cells.

MOST:

- I can state the function of named specialised cells.

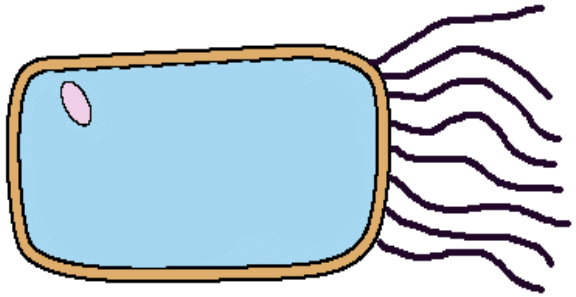
SOME:

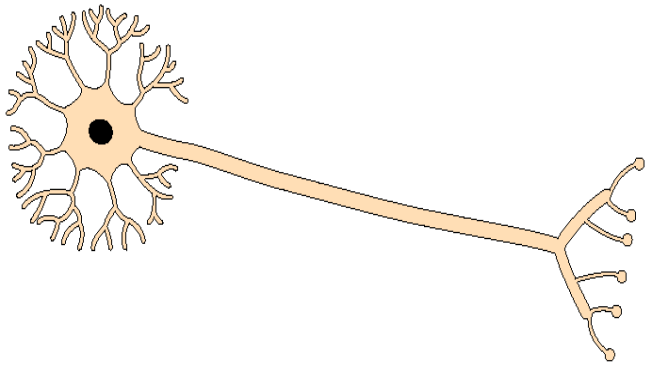
- I can describe the adaptations named specialised cells have to help them carry out their functions.

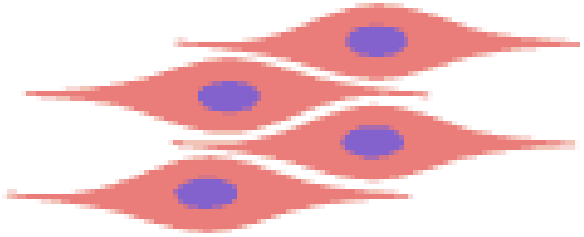
Specialised cells

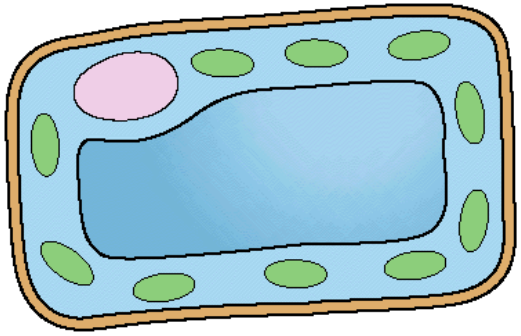
Some cells change their shape to carry out a particular job.

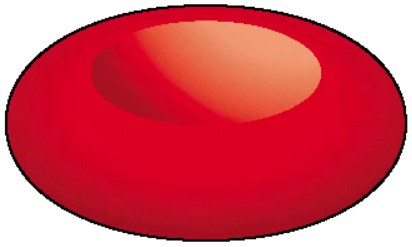
What do all these have in common?

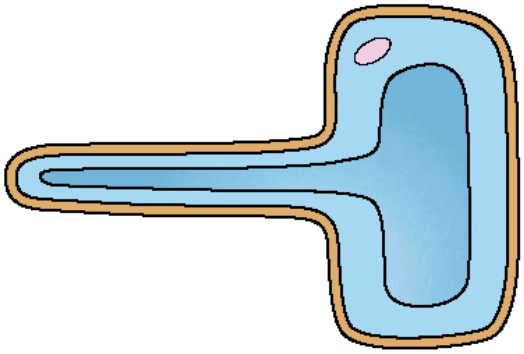








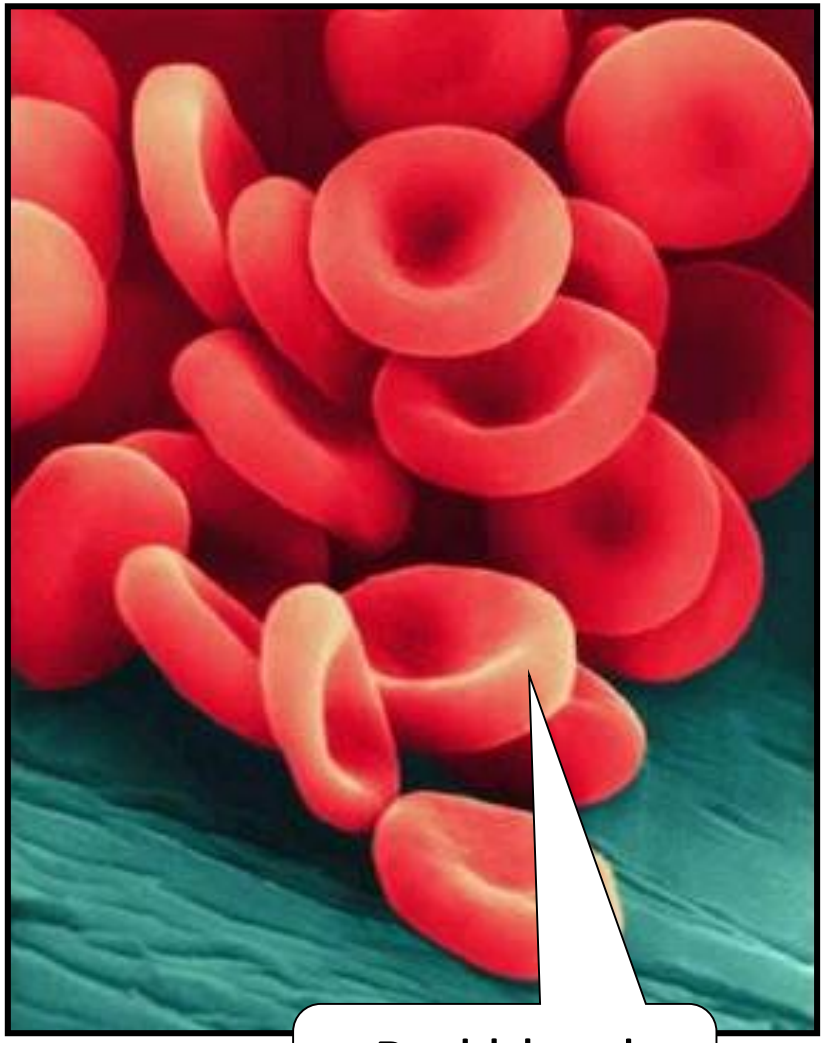




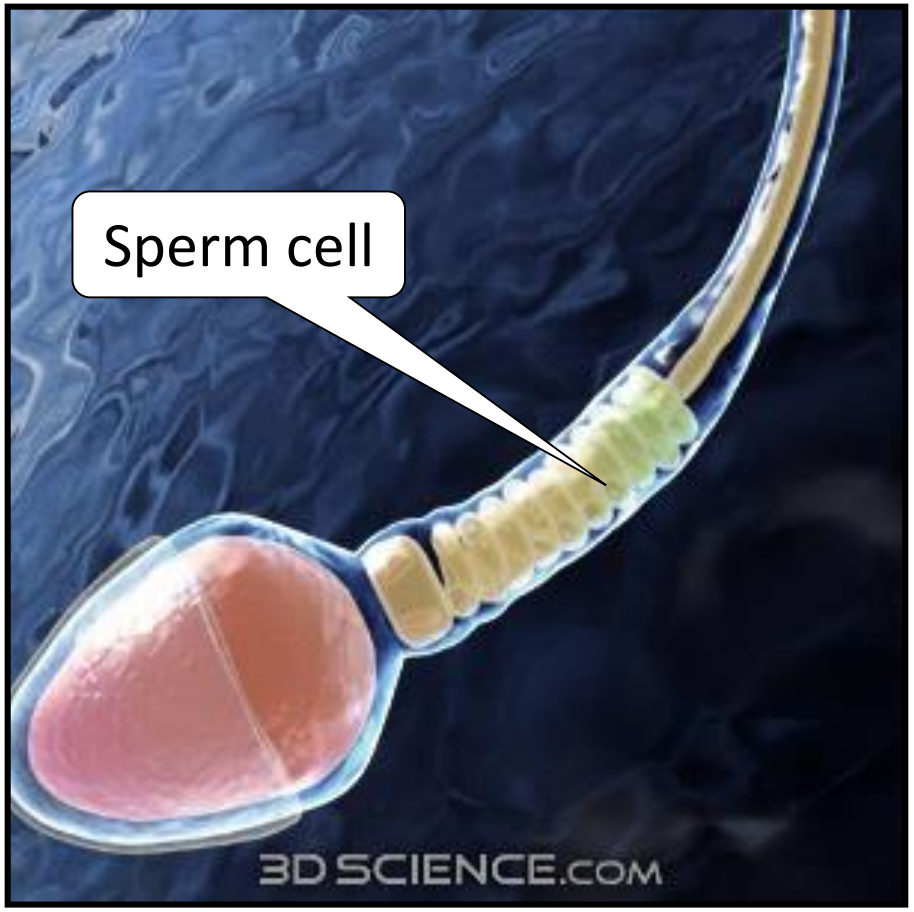
WHAT IS A SPECIALISED CELL?

- **Plants** and **animals** consist of many cells and so are known as **multicellular organisms.**
- They contain many **different** types of cells.
- Each type of cell is designed to carry out a **particular job** or **function**.
- This is known as **cell specialism.**
- Not all cells look the same.
- Some cells have a **special shape** and **features** or **adaptations** to help them do a certain job.

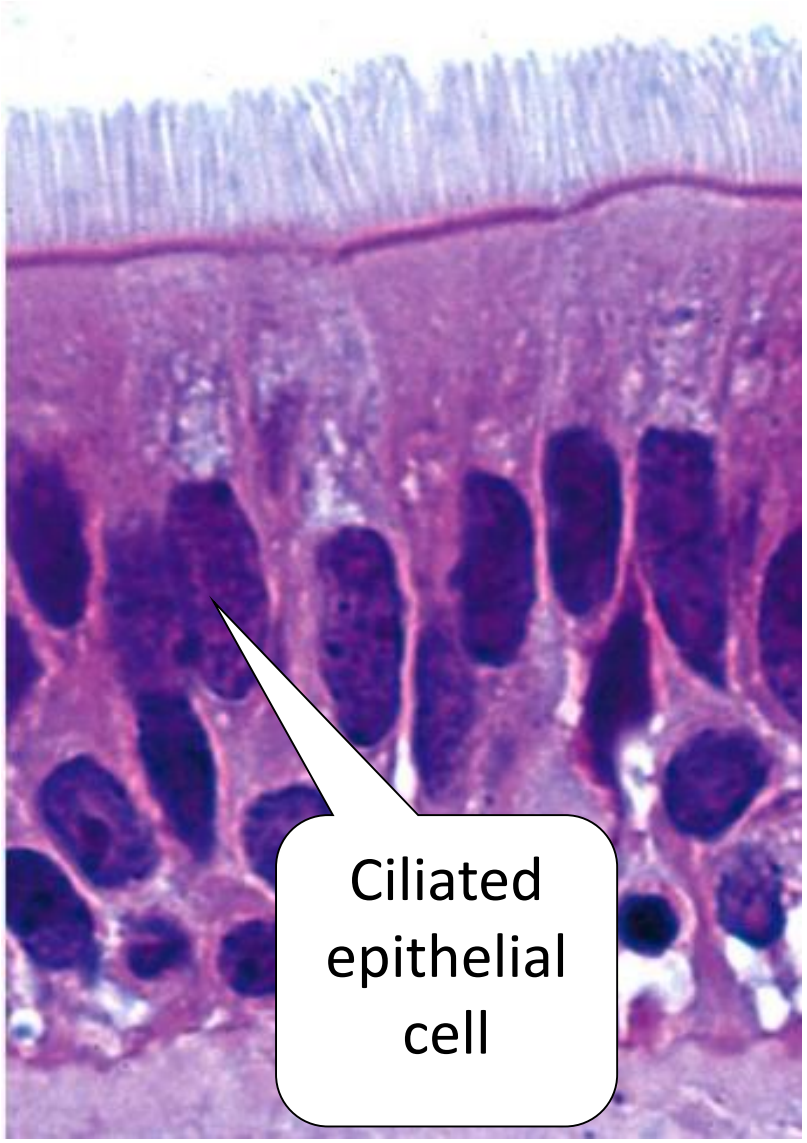
Examples of special animal cells

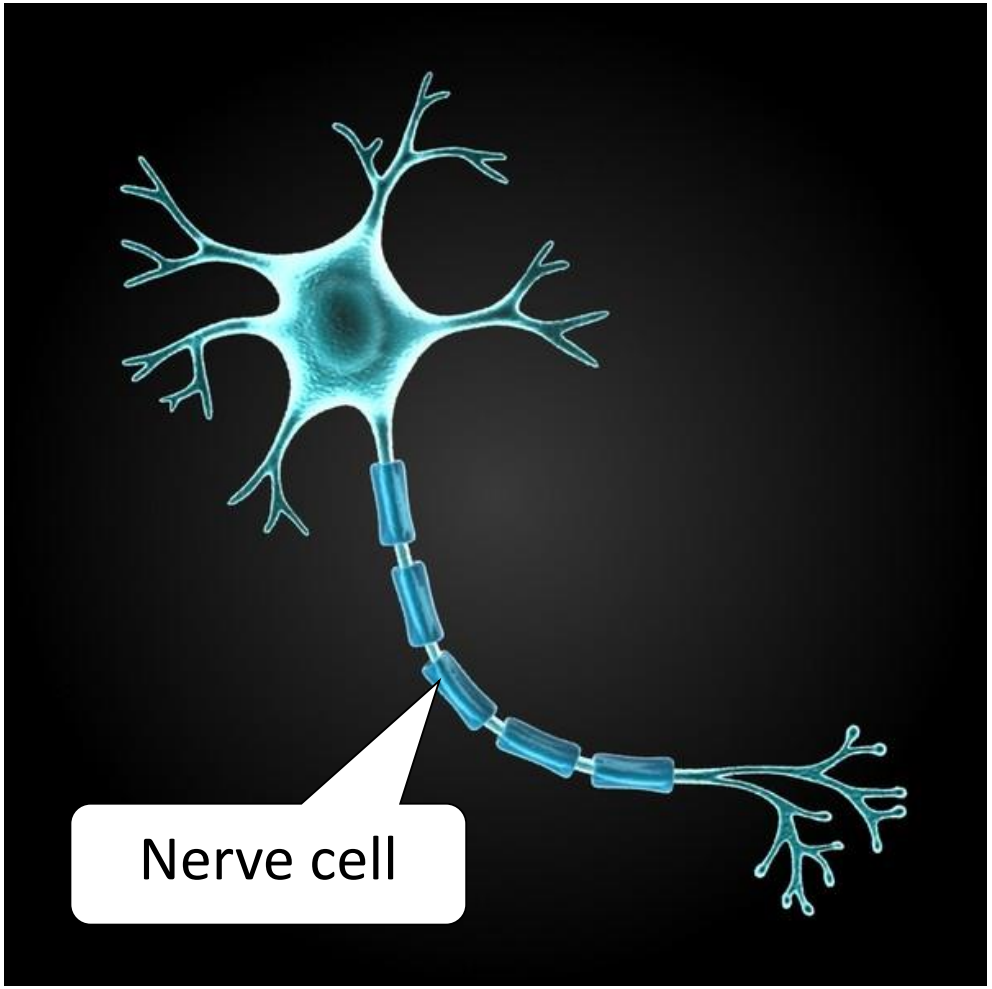


Red blood cells

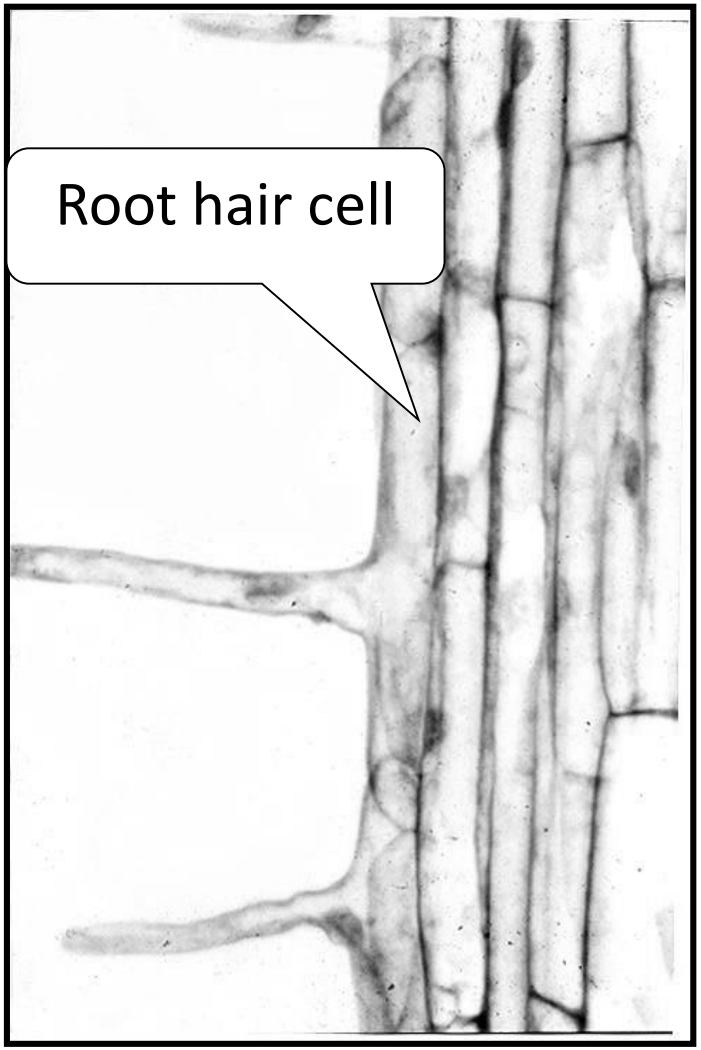


Examples of special animal cells





Examples of special plant cells



*Specialised Cell SPEED DATING

1. You are each going to be given a specialised cell, e.g. sperm cell.
2. You will have 5 minutes to 'find out more about yourself'
3. You will then go on a series of dates to get to know all of the other specialised cells.

Specialised Cell SPEED DATING

1. Don't feel nervous and remember to make eye contact with your date.
2. Listen carefully to what your partner is saying.
3. Test each other to see how much you have remembered.
4. Ask lots of questions

Specialised Cells

BQ: Why do cells need to be specialised?

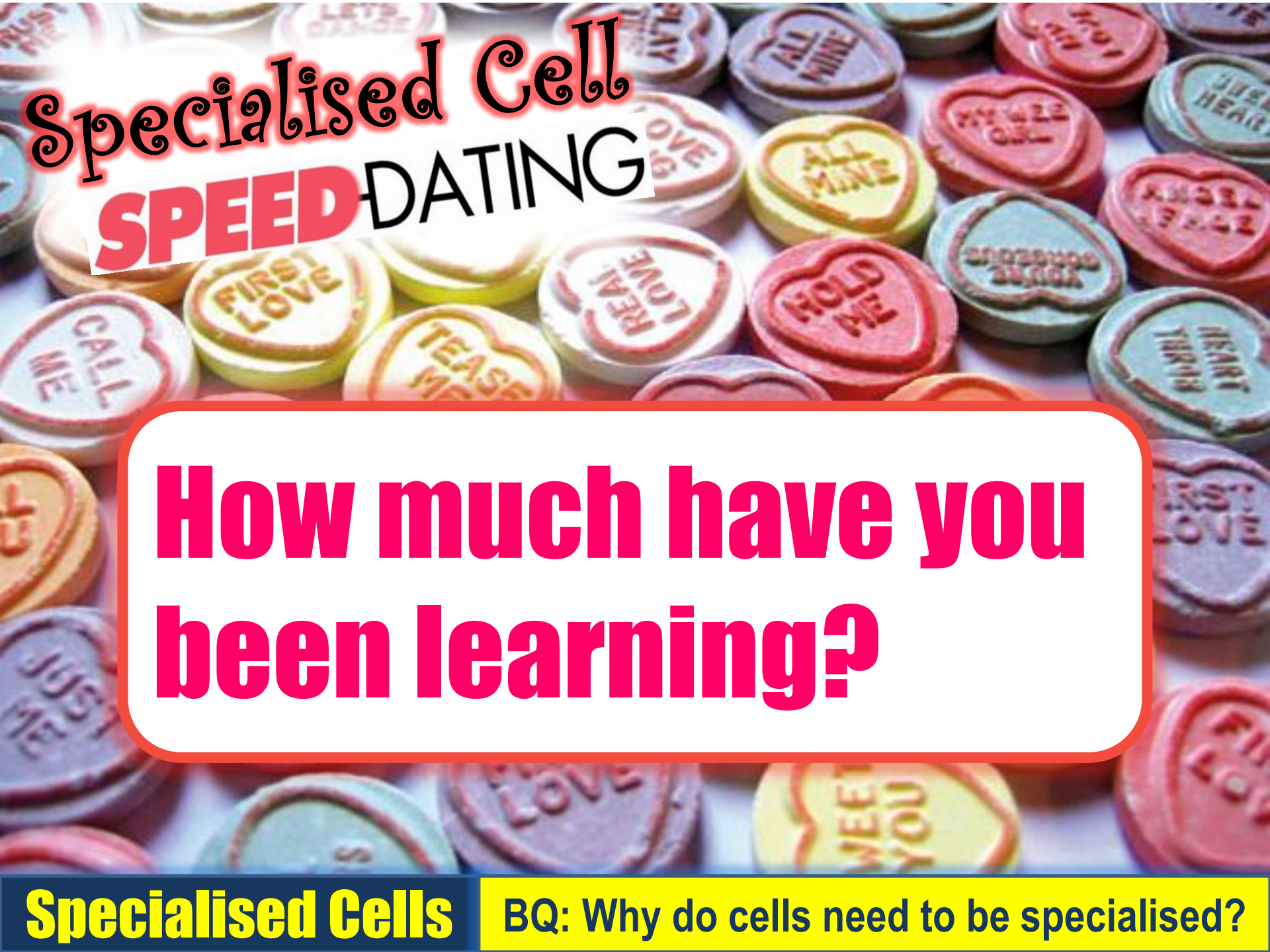
ACTIVITY:

Divide class into 2 groups, A & B.
Number the pupils 1-6 in each group and give the cards; there may be more than 2 of a particular number and card in each group.
Give out the 6 cards with information about the 6 cell types. Pupils have 5 mins to read the info & learn.

Line up pupils in 2 rows from 1 to 6 and so on.
Sit one row down on stools in numerical order.
The other row sits facing, with numbers starting from the opposite end.
Pupils have 4 mins to exchange information. The 2nd row moves one seat up & repeat 4 times.

1 2 3 4 5 6 1 2 3

6 5 4 3 2 1 6 5 4



Specialised Cells

BQ: Why do cells need to be specialised?

Specialised Cell SPEED DATING Quiz!

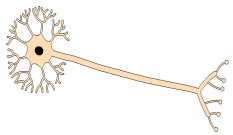
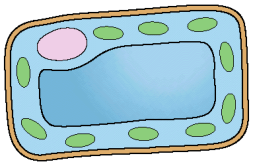
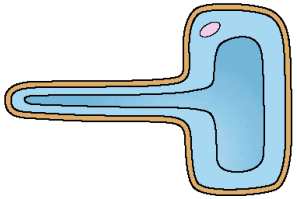
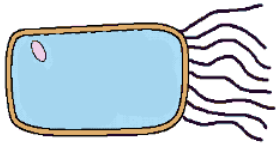
		TRUE	FALSE
1.	When the filaments in muscle cells contract the muscle cell gets longer and when the filaments relax the muscle cells get shorter.		
2.	The function of a red blood cell is to carry oxygen around the body.		
3.	Palisade cells are found in the roots of plants.		
4.	The nerve cell has a long thin strand of cytoplasm which makes it faster to send electrical impulses around the body.		
5.	The root hair cell contains no chloroplasts.		
6.	Red blood cells contain a pigment called chlorophyll which sticks to oxygen molecules.		
7.	Ciliated epithelial cells in the respiratory system help to trap and get rid of bacteria before they get into our bodies.		
8.	Sperm cells contain a full set of genes form the father that are passed on to the offspring.		
9.	The function of the nerve cell is to quickly send and receive electrical impulses to and from the brain and nervous system.		
10.	The function of the palisade cell is to carry out photosynthesis. It has many chloroplasts because this is where photosynthesis happens within a cell.		
11.	Ciliated epithelial cells have many tiny hairs called microfibrils.		
12.	Root hair cells form the hairs on our heads.		

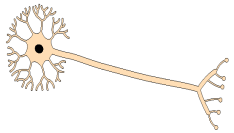
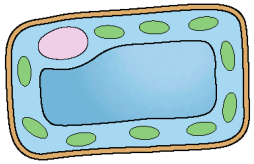
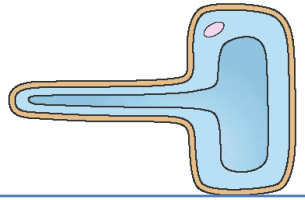
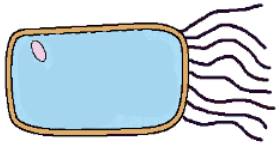
Specialised Cell SPEED DATING Quiz!

		TRUE	FALSE
1.	When the filaments in muscle cells contract the muscle cell gets longer and when the filaments relax the muscle cells get shorter.		✓
2.	The function of a red blood cell is to carry oxygen around the body.	✓	
3.	Palisade cells are found in the roots of plants.		✓
4.	The nerve cell has a long thin strand of cytoplasm which makes it faster to send electrical impulses around the body.	✓	
5.	The root hair cell contains no chloroplasts.	✓	
6.	Red blood cells contain a pigment called chlorophyll which sticks to oxygen molecules.		✓
7.	Ciliated epithelial cells in the respiratory system help to trap and get rid of bacteria before they get into our bodies.	✓	
8.	Sperm cells contain a full set of genes form the father that are passed on to the offspring.		✓
9.	The function of the nerve cell is to quickly send and receive electrical impulses to and from the brain and nervous system.	✓	
10.	The function of the palisade cell is to carry out photosynthesis. It has many chloroplasts because this is where photosynthesis happens within a cell.	✓	
11.	Ciliated epithelial cells have many tiny hairs called microfibrils.		✓
12.	Root hair cells form the hairs on our heads.		✓

Adaptations and Functions of Specialised Cells

WS 2.6b

	**Ciliated Epithelial cell**	Blood (animal)	• Long and thin: increases surface area to take water into plant roots. • No chloroplasts: no light, no PS
	**Red blood cell**	Lines cavities e.g. airways (animal)	• Haemoglobin: carries oxygen. • No nucleus: more haemoglobin. • Disc shaped:large surface area for absorbing oxygen
	**Nerve cell (neurone)**	Connect sensors to the brain (animal)	• Has tiny hair-like extensions: help move substances in one direction
	**Sperm cell**	Testes (animal)	• Tail: allows cell to swim to ovum • Half a set of chromosomes: to pass on to the offspring.
	**Palisade cell**	Plant root (plant)	• Lots of chloroplasts containing chlorophyll: trap sunlight for photosynthesis
	**Root hair cell**	Leaf (plant)	• Long: transmits electrical signals called impulses over long distances

* CELL		LOCATION	ADAPTATION & FUNCTION
	**Nerve cell (neurone)**	Connect sensors to the brain (animal)	• Long: transmits electrical signals called impulses over long distances
	**Palisade cell**	Leaf (plant)	• Lots of chloroplasts containing chlorophyll: trap sunlight for photosynthesis
	**Root hair cell**	Plant root (plant)	• Long and thin: increases surface area to take water into plant roots. • No chloroplasts: no light, no PS
	**Red blood cell**	Blood (animal)	• Haemoglobin: carries oxygen. • No nucleus: more haemoglobin. • Disc shaped:large surface area for absorbing oxygen
	**Ciliated Epithelial cell**	Lines cavities e.g. airways (animal)	• Has tiny hair-like extensions: help move substances in one direction
	**Sperm cell**	Testes (animal)	• Tail: allows cell to swim to ovum • Half a set of chromosomes: to pass on to the offspring.

Building a model cell

Success Criteria	Achieved?

HAVE WE MET OUR OWN SUCCESS CRITERIA?

Swap with another group and check to see if they have achieved ALL the success criteria?

Why are success criteria important?

*

KEY QUESTIONS

- How are cells organised in organisms?
- What is a tissue?
- What is an organ?
- What are organ systems?

LEARNING INTENTIONS

- We are learning how cells interact to form organisms.

SUCCESS CRITERIA

ALL:

- I can give examples of tissues, organs, organs systems and organisms.
- I can name the major organs in the human body and describe their locations.

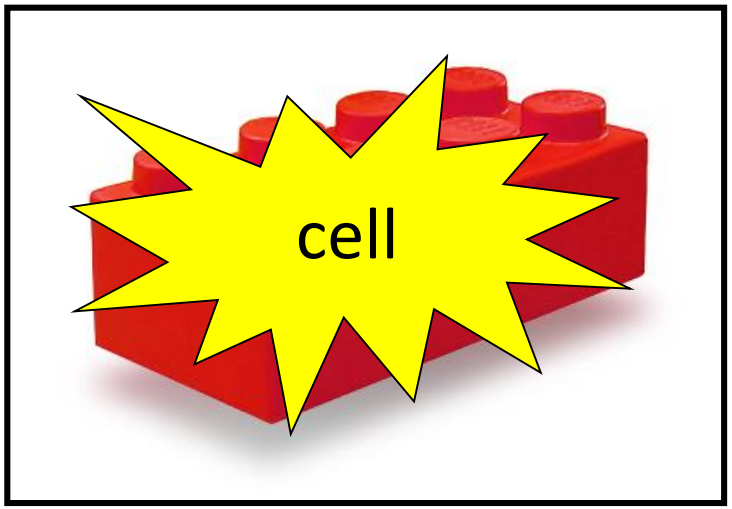
MOST:

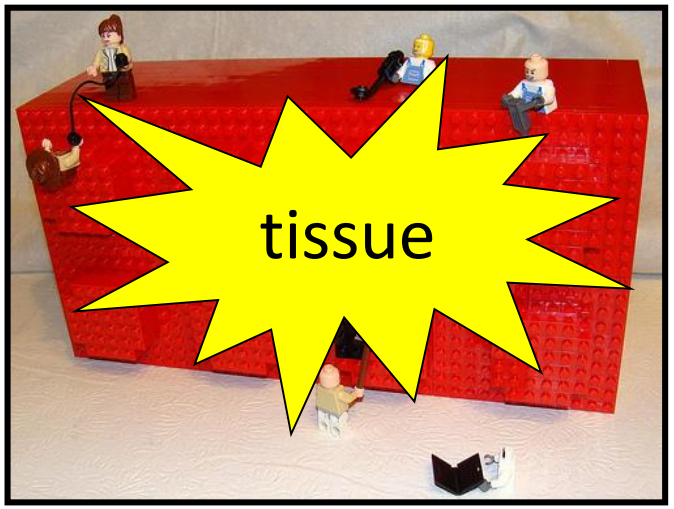
- I can explain what tissues, organs, organs systems and organisms are.

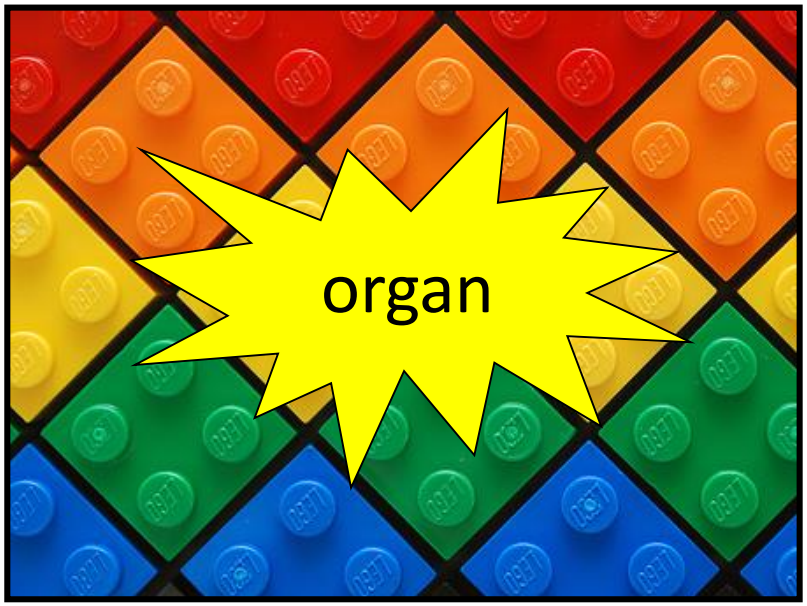
SOME:

- I can understand some of the scientific and ethical issues associated with transplants.

All	Most	Some
You **must** be able to describe the location of major human organs.	You **should** be able to explain what tissues and organs are.	You **could** be able to understand some of the scientific and ethical issues associated with transplants.


cell

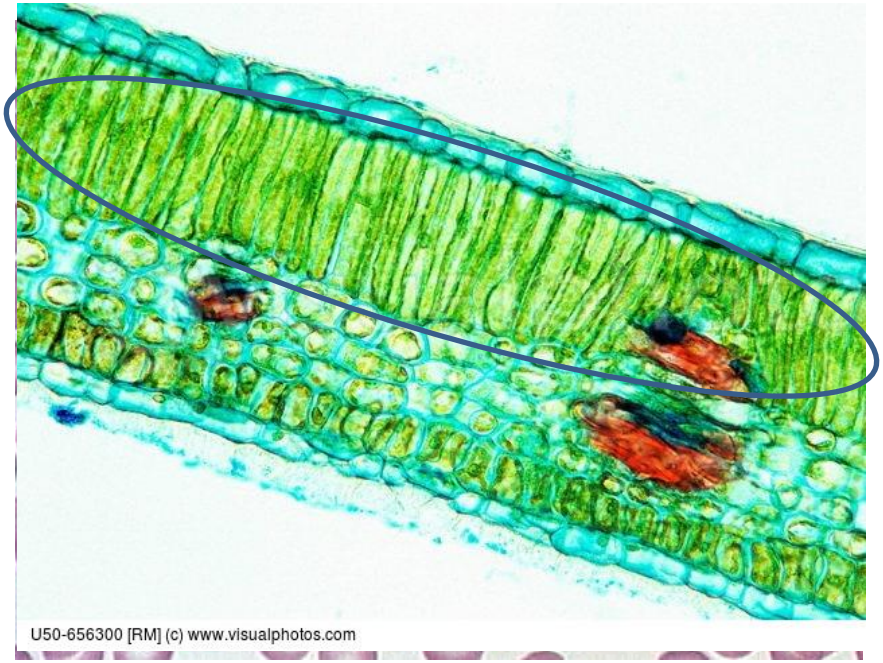

tissue


organ


system

TISSUES

These are groups of similar cells that work together to carry out a specific function.



Examples of tissues include:

1. Muscle tissue: containing muscle cells
2. Blood tissue: made of red blood cells, white blood cells and platelets
3. Epithelium: layers of cells that line the lungs and intestine.
4. Mesophyll: layers of cells that carry out photosynthesis in plants.

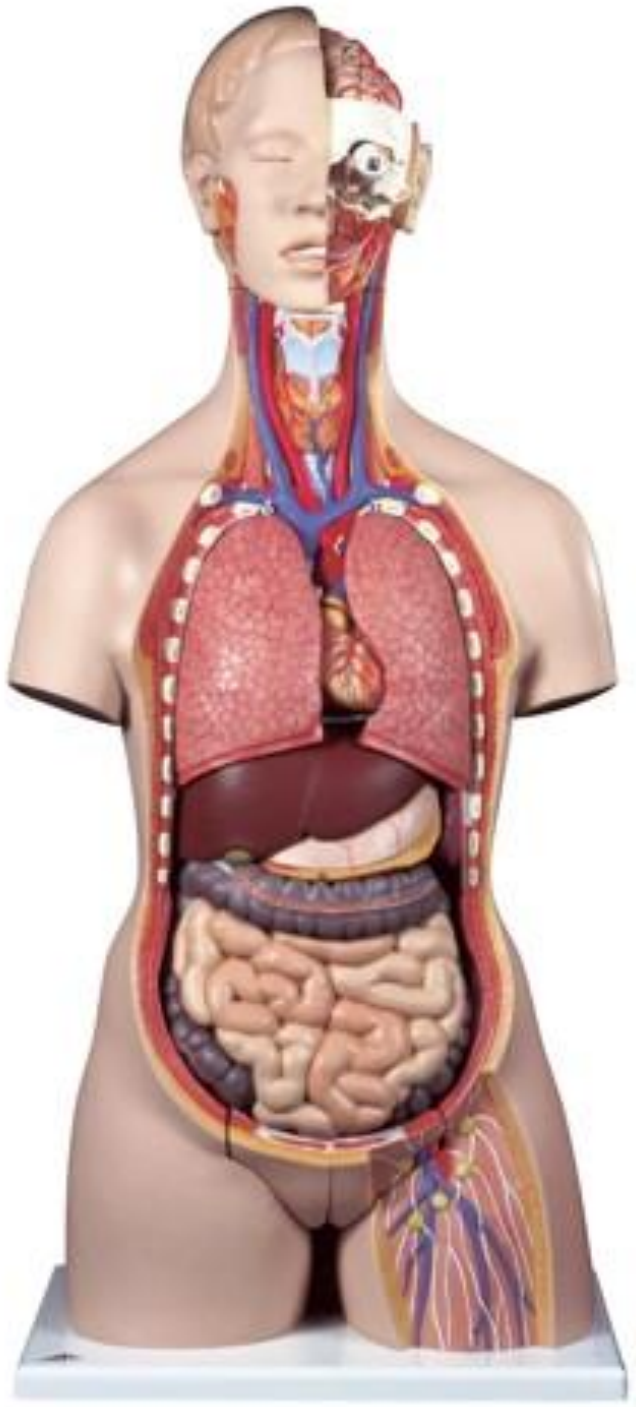
ORGANS

These are groups of tissues that work together to carry out a specific function.

Examples of organs include:

1. Muscles: containing muscle tissue, blood tissue and nervous tissue
2. The Brain: made of nervous tissue and blood tissue.
3. Lungs: made of epithelial tissue and blood tissue.

Looking at the torso

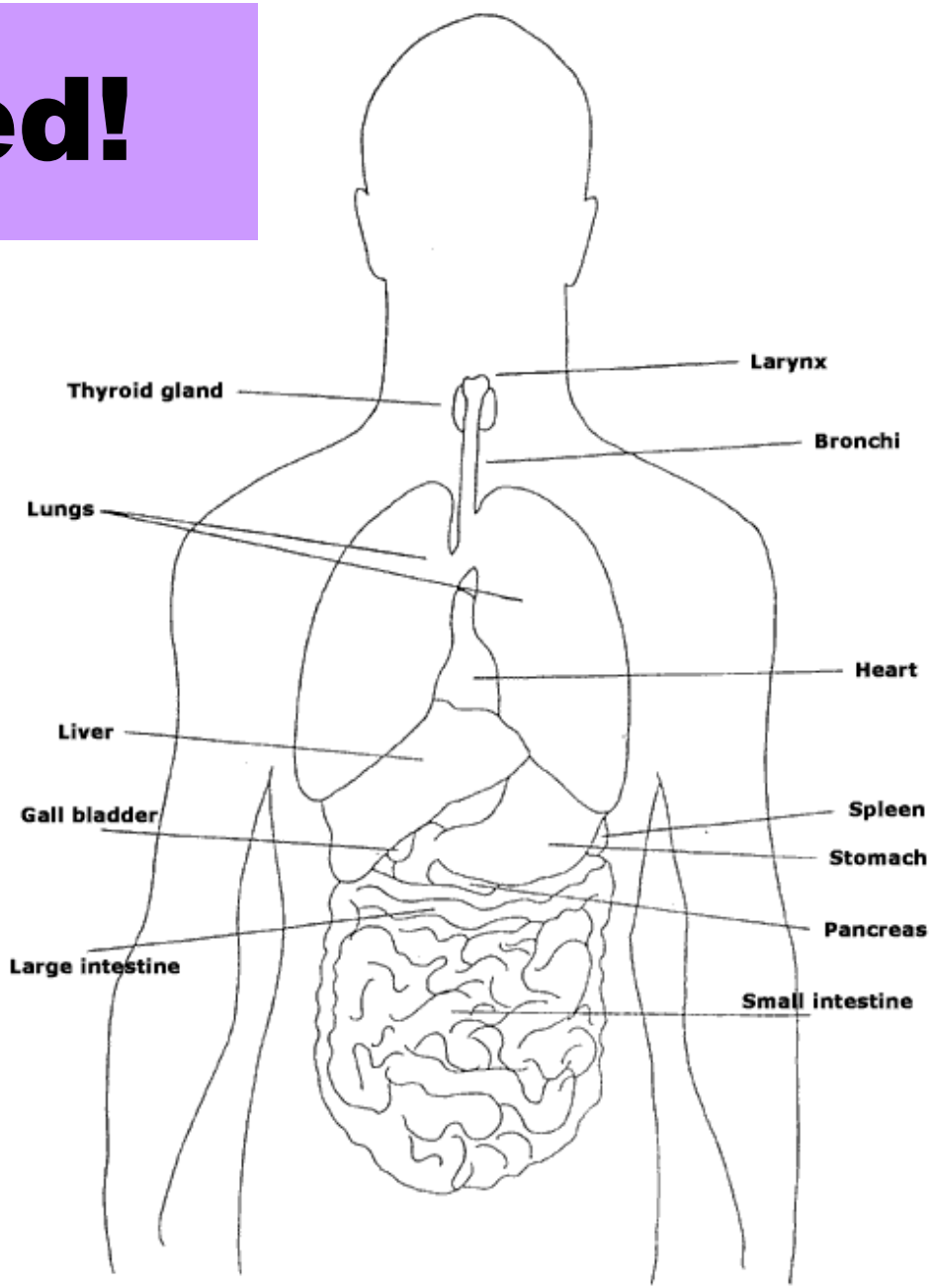


* Get Organised!

DRAG & DROP ACTIVITY

http://sciencenetlinks.com/media/filer/2011/10/13/allsystems.swf

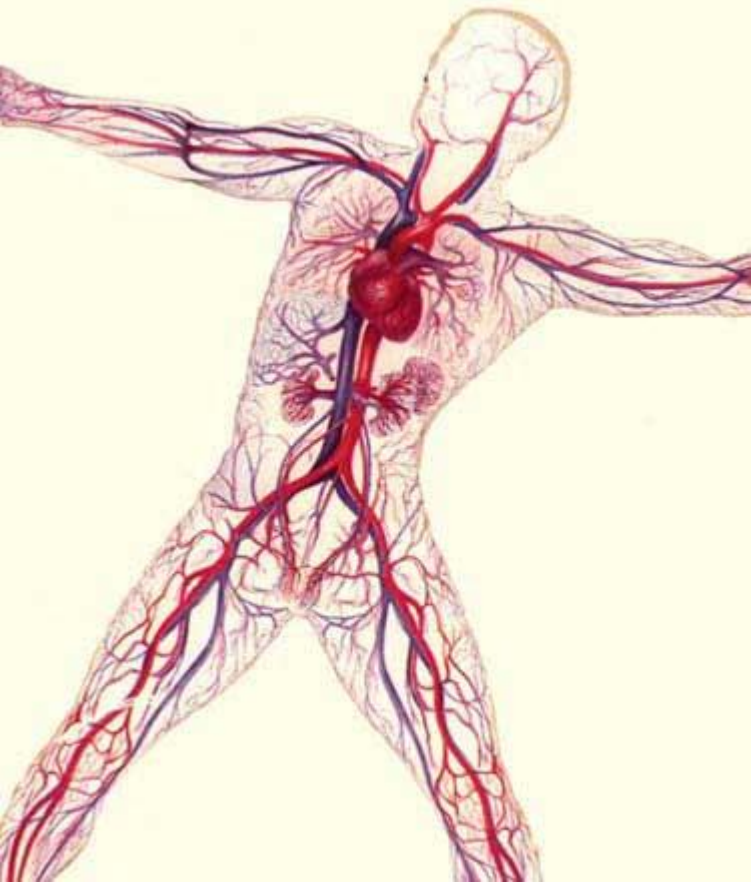
http://www.bbc.co.uk/science/humanbody/body/interactives/3djigsaw_02/main.shtml

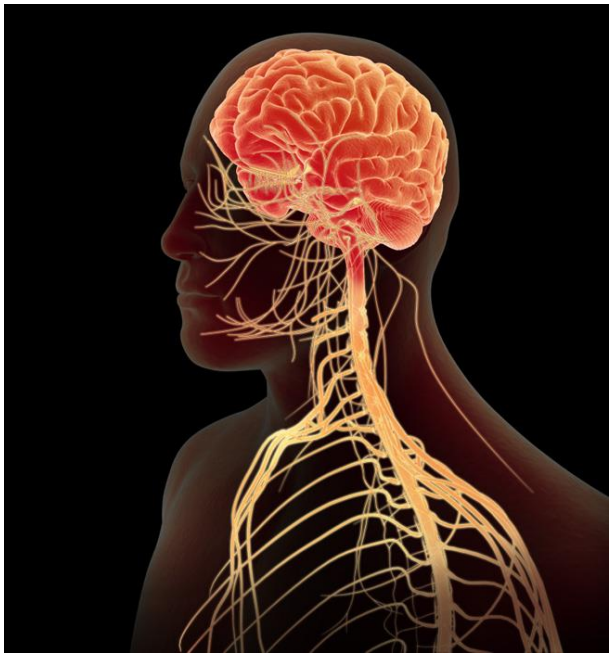


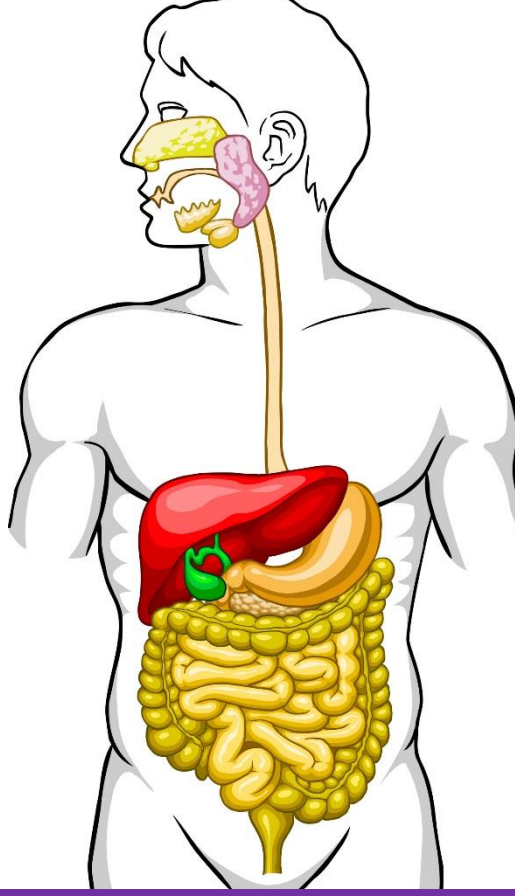
WS 2.7a

ORGAN SYSTEMS

These are groups of organs that work together to carry out a specific function.







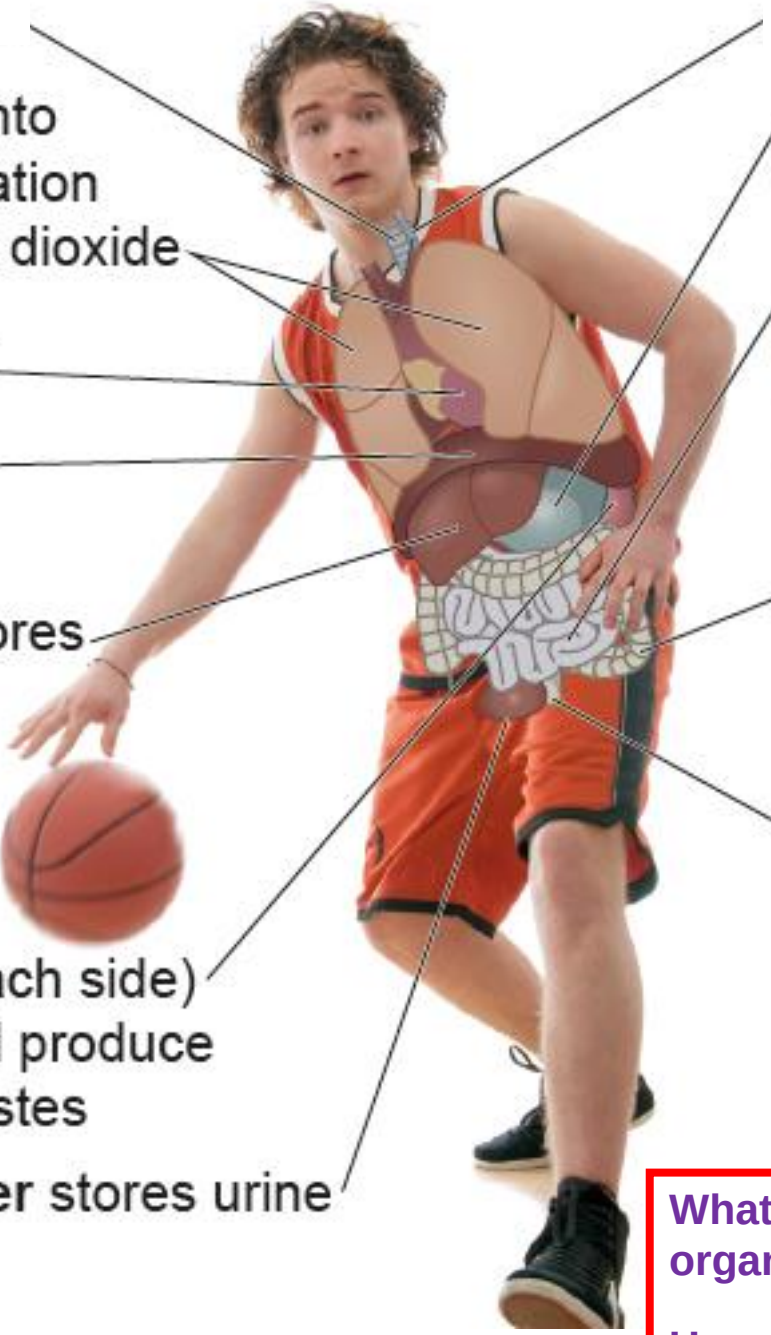
Examples of organ systems include:

1. Circulatory system: containing blood vessels and the heart.
2. Nervous system: made of the brain and spinal cord.
3. Digestive system: made of mouth, stomach and intestines

WS 2.7b:
match organ diagrams to their names and functions

WS 2.7c: match organs to the correct organ system

Learn definitions for tissues, organs & organ systems



trachea

lungs get oxygen into the blood for respiration and excrete carbon dioxide

heart pumps blood

diaphragm helps breathing

liver makes and stores some substances, and destroys other substances

kidneys (one on each side) clean the blood and produce urine to excrete wastes

bladder stores urine

oesophagus

stomach breaks up food

small intestine breaks up food and absorbs it to produce nutrition for the body

large intestine removes water from unwanted food

rectum stores faeces (waste materials excreted by the liver and unwanted food)

WS 2.7c

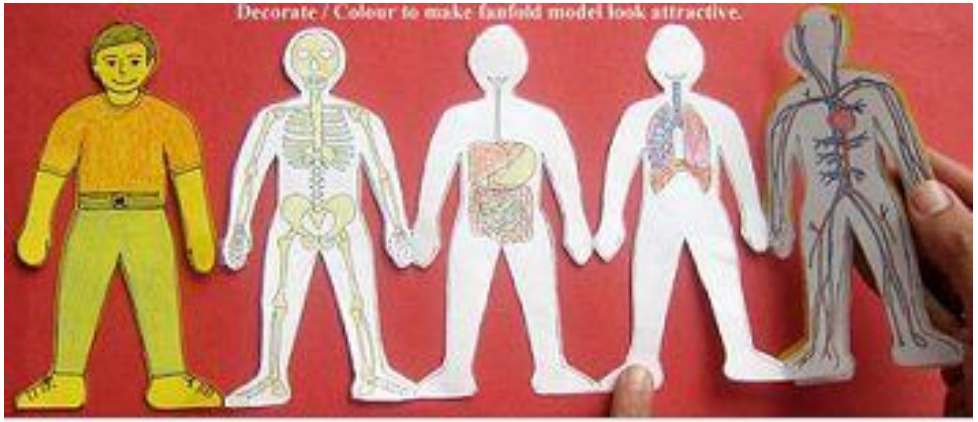
What organ system does each organ in this photo belong to?

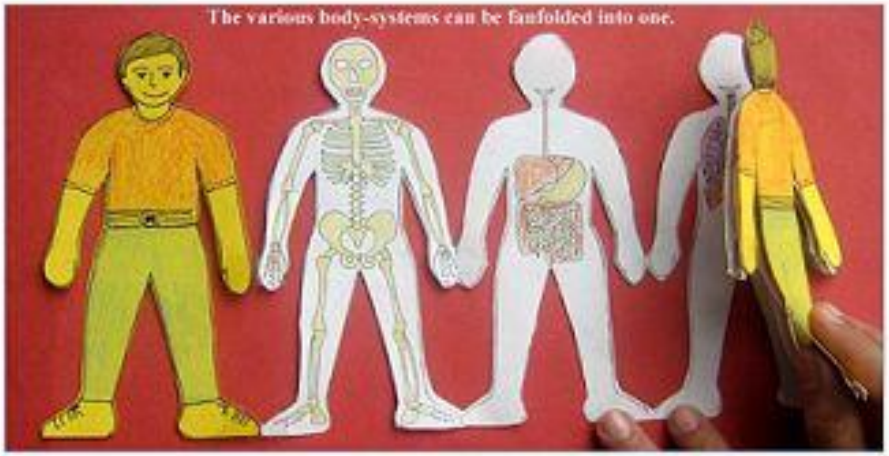
Use a table to show your answer.

*

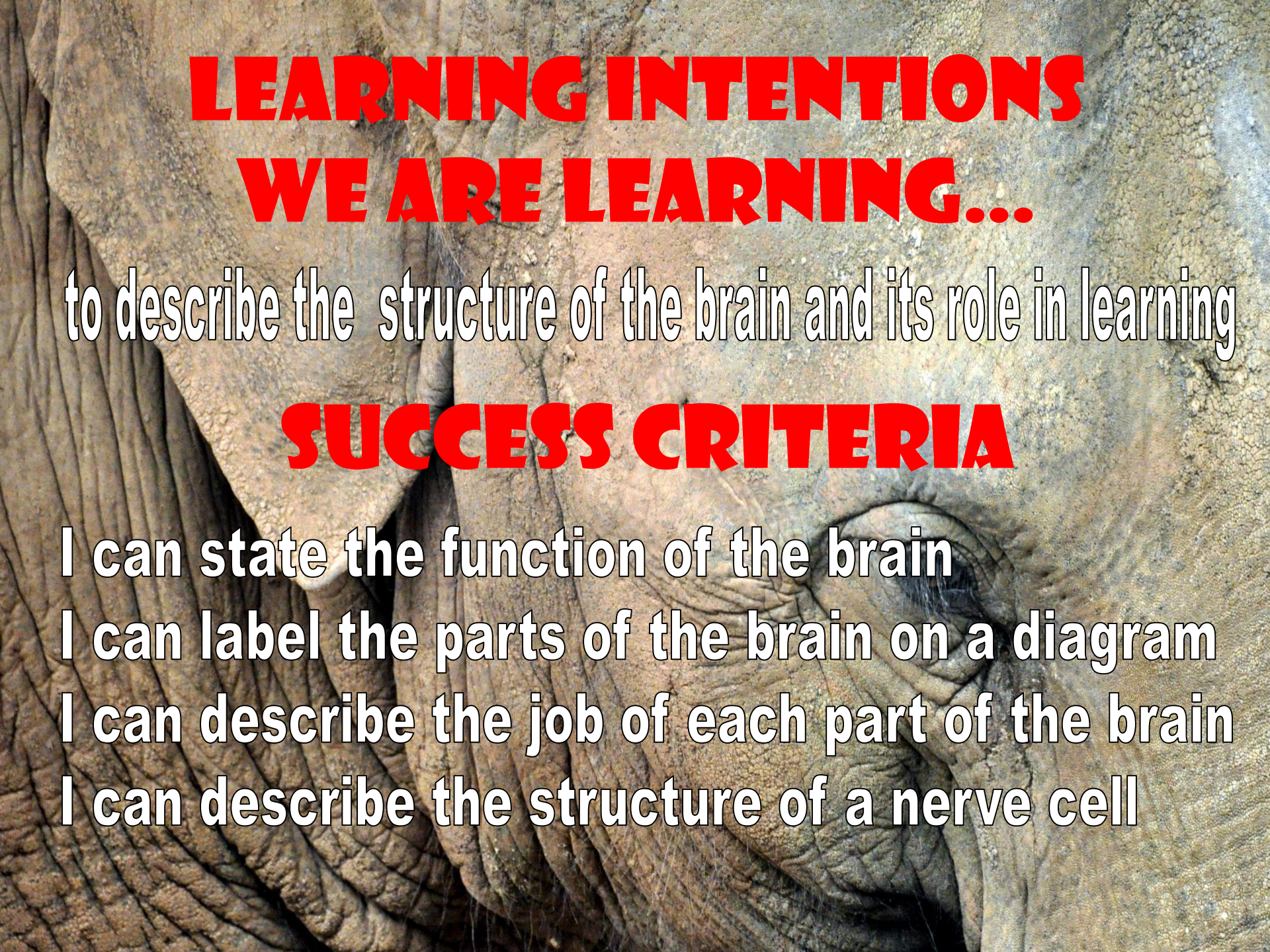
ORGAN	ORGAN SYSTEM
Trachea	Respiratory system
Lungs	Respiratory system
Heart	Circulatory system
Diaphragm	Respiratory system
Liver	Digestive system
Kidneys	Excretory system
Bladder	Excretory system
Oesophagus	Digestive system
Stomach	Digestive system
Small intestine	Digestive system
Large intestine	Digestive system
Rectum	Digestive system

WS 2.7d Body system foldable






the brain &
learning



LEARNING INTENTIONS

WE ARE LEARNING...

to describe the structure of the brain and its role in learning

SUCCESS CRITERIA

I can state the function of the brain

I can label the parts of the brain on a diagram

I can describe the job of each part of the brain

I can describe the structure of a nerve cell

*

STARTER

make a brain model with plasticine

https://www.wikihow.com/Make-a-Brain-Out-of-Clay

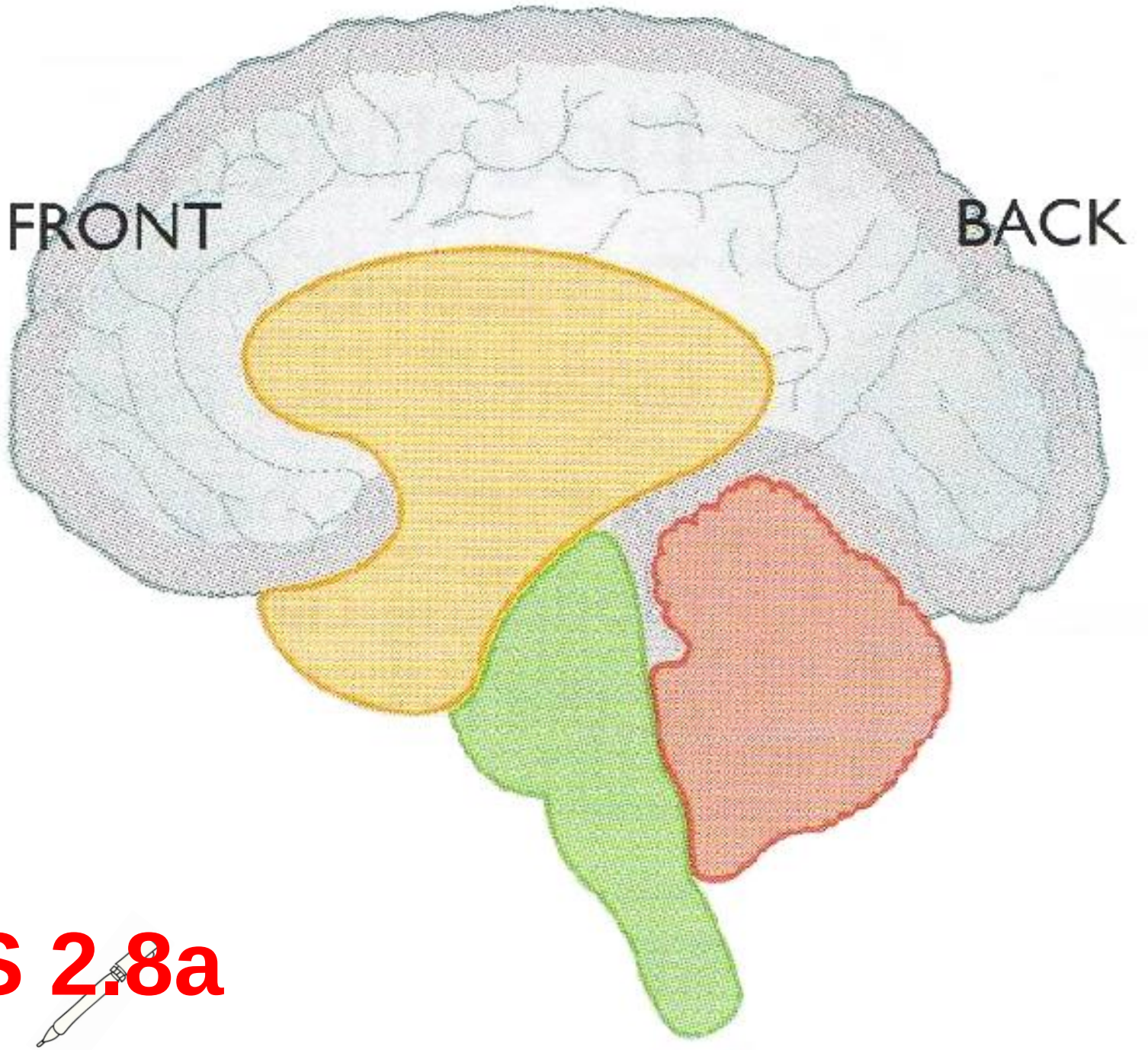
AfL activity

Label the brain

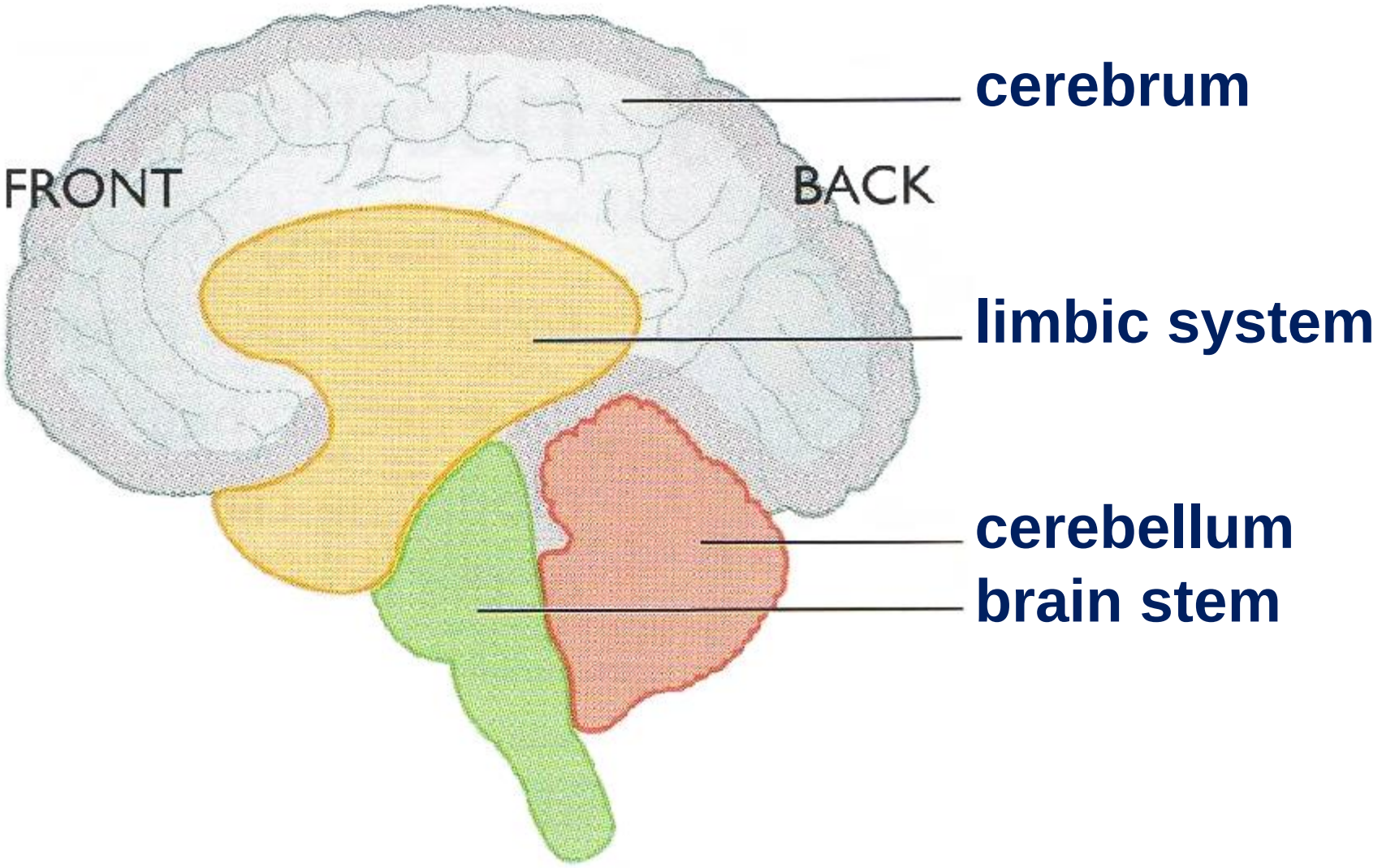
Give out the laminated diagram and labels and get pupils in pairs to label the diagram with functions.

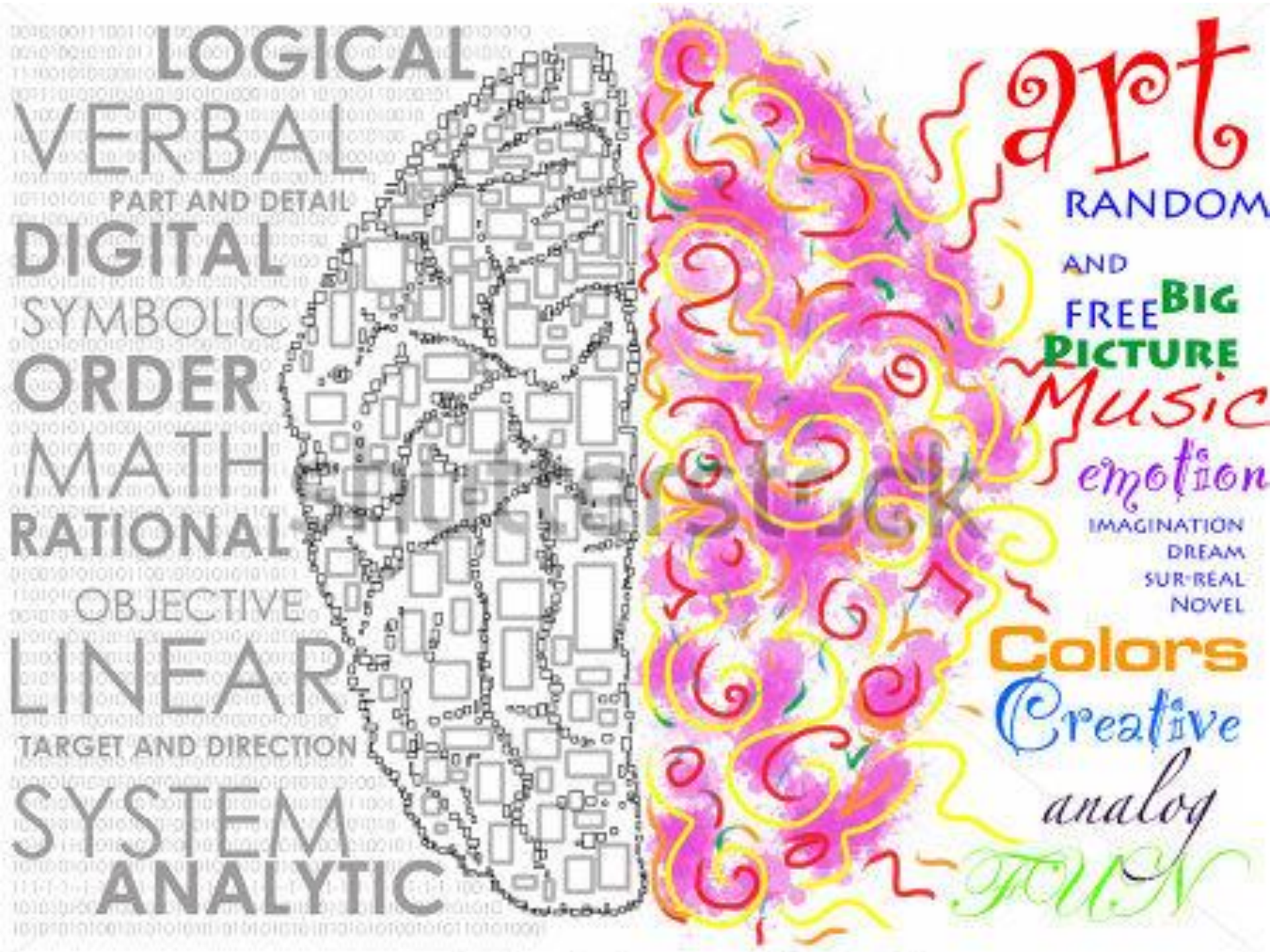
Pupils glue WS 2.8a in book
and label brain diagram.

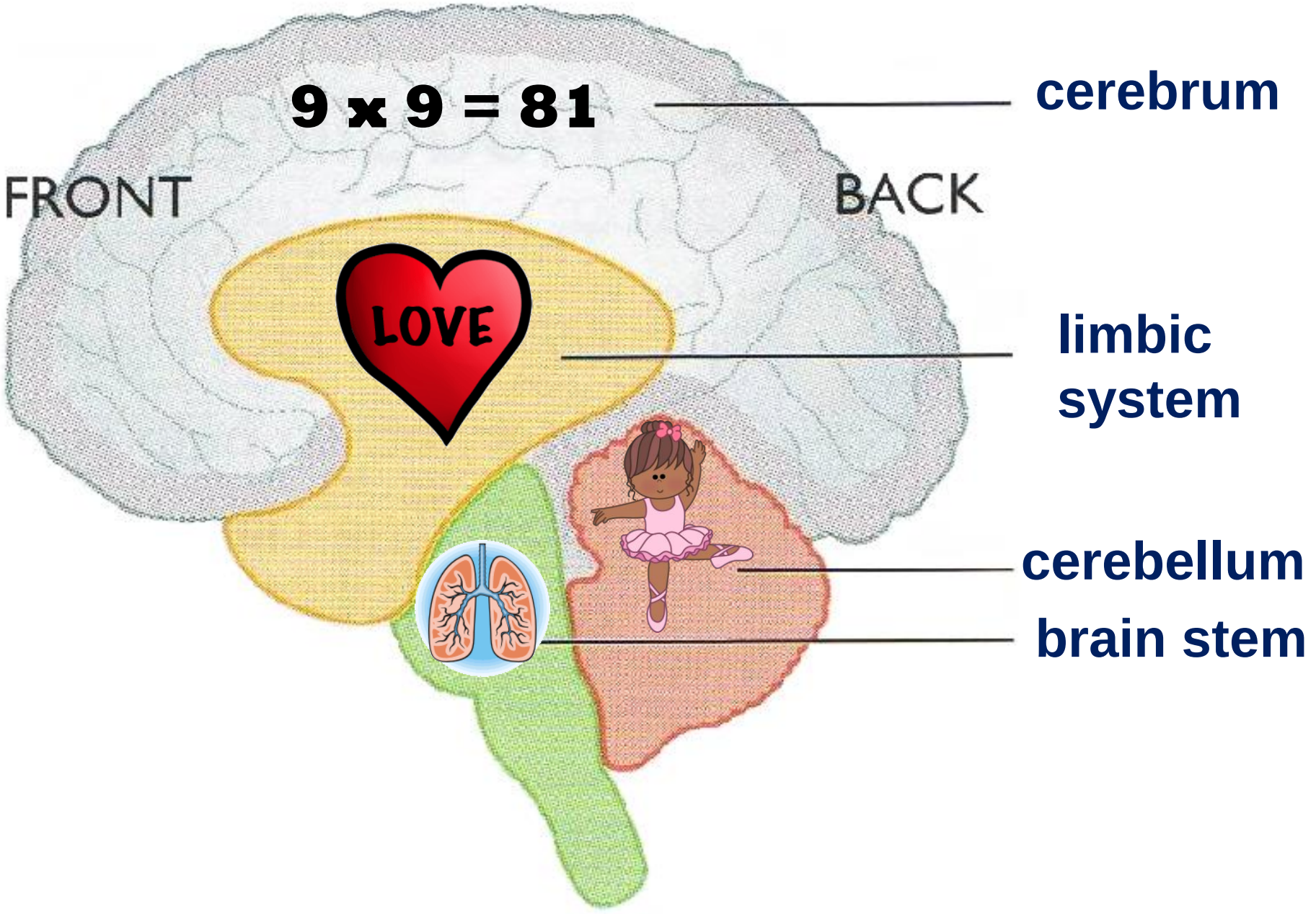
*



WS 2.8a


FRONT
BACK
cerebrum
limbic system
cerebellum
brain stem


LOGICAL
VERBAL
PART AND DETAIL
DIGITAL
SYMBOLIC
ORDER
MATH
RATIONAL
OBJECTIVE
LINEAR
TARGET AND DIRECTION
SYSTEM
ANALYTIC
art
RANDOM
AND
FREE
BIG
PICTURE
Music
emotion
IMAGINATION
DREAM
SUR-REAL
NOVEL
Colors
Creative
analog
FUN


9 x 9 = 81
FRONT
BACK
LOVE
cerebrum
limbic system
cerebellum
brain stem

The brain is made up of 4 parts:

The brain stem:
this controls automatic reactions such as breathing

The limbic system:
this is where your emotions are controlled

The cerebellum:
responsible for controlling movement and balance

The cerebrum (or cortex):
controls conscious thought & communication

The **cerebrum** is divided into 2 halves called **hemispheres**.

It is believed that the **right** hemisphere is important in **CREATIVITY** such as drawing, music and DANCE .

The **left** side of the brain is thought to be responsible for logical activities such as calculating sums, sequencing and carrying out science experiments.

However both sides of the brain work together in carrying out most tasks.

CARD SORT ACTIVITY

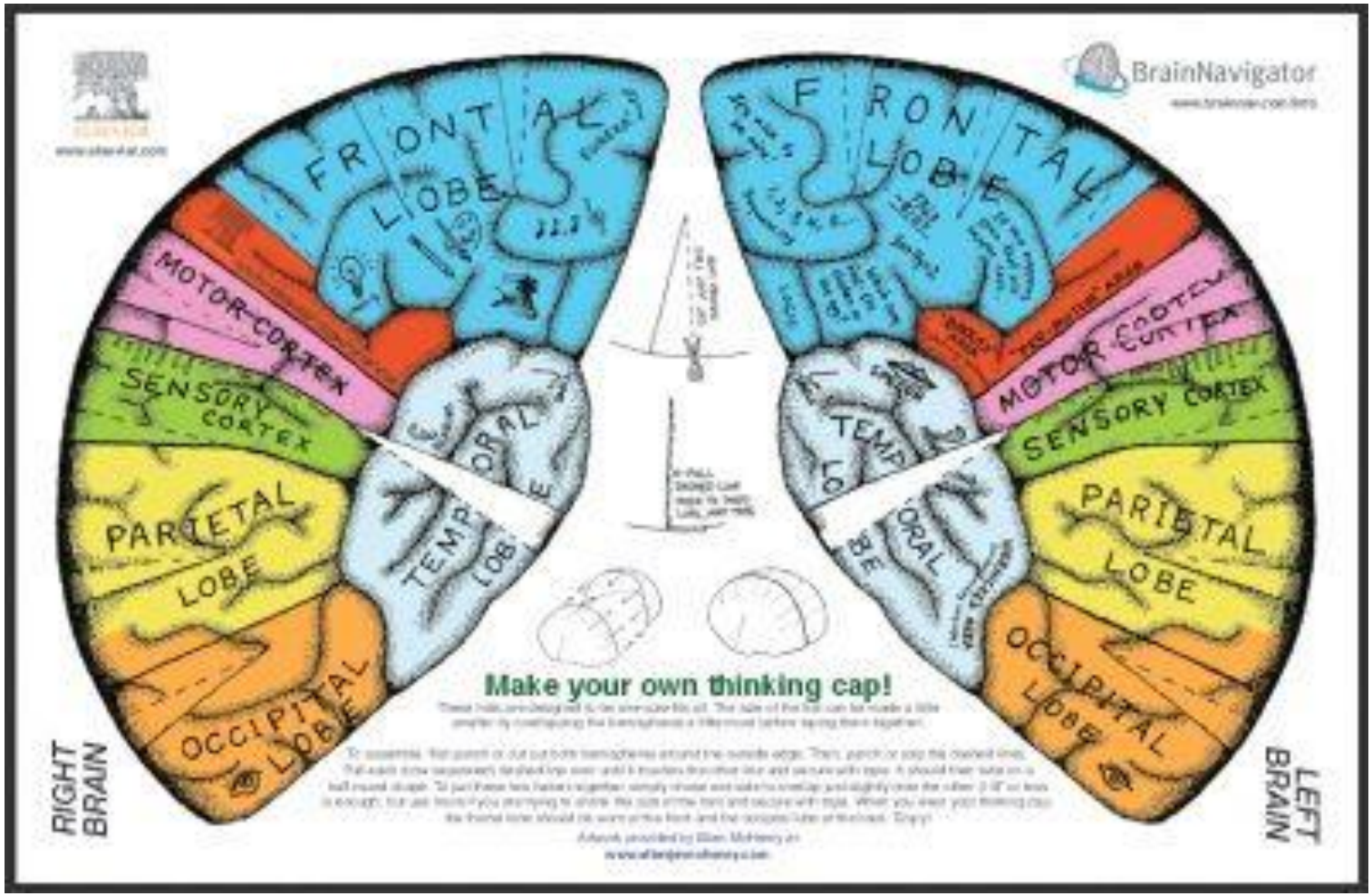
WS 2.8b

PART	FUNCTION
2 hemispheres	
cerebrum	
cerebellum	
brain stem	
limbic system	

Functions of the brain

PART	FUNCTION
2 hemispheres	2 halves of the brain, each control opposite sides of the body
cerebrum	controls conscious thought & communication
cerebellum	controls movement including balance & coordination
brain stem	controls automatic actions e.g. breathing
limbic system	where emotions develop and memory & learning occur

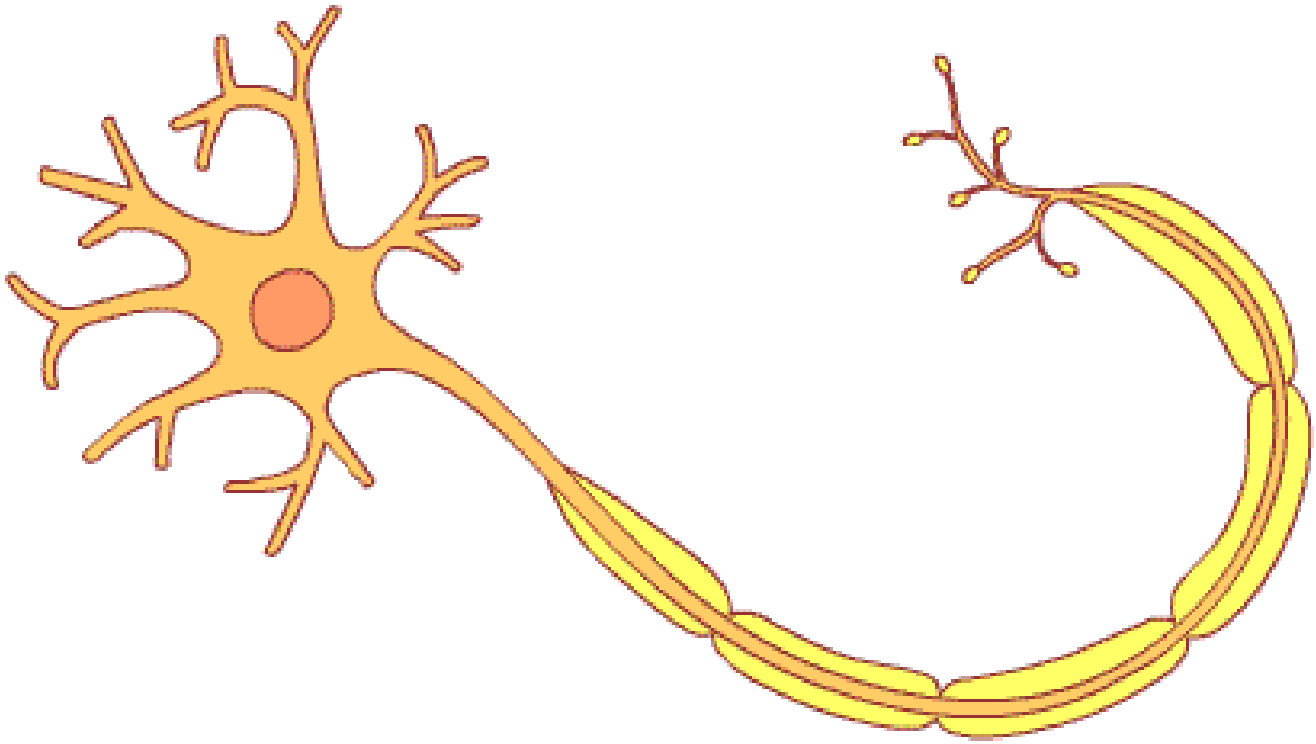
Optional activity make a brain hat




SENSORY CORTEX
MOTOR CORTEX
Creativity
HEARING
SMELL
TEMPORAL
LOBE

* how the brain receives information

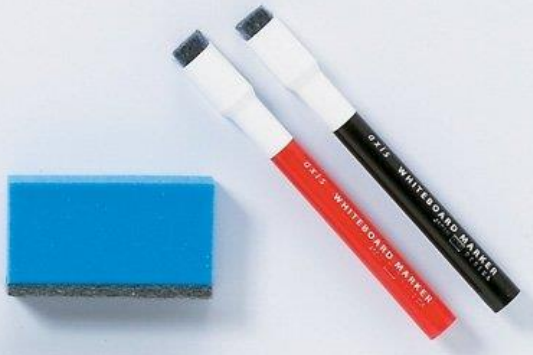
- Information is carried to and from the brain by nerve cells, called **neurones**.



On the whiteboard

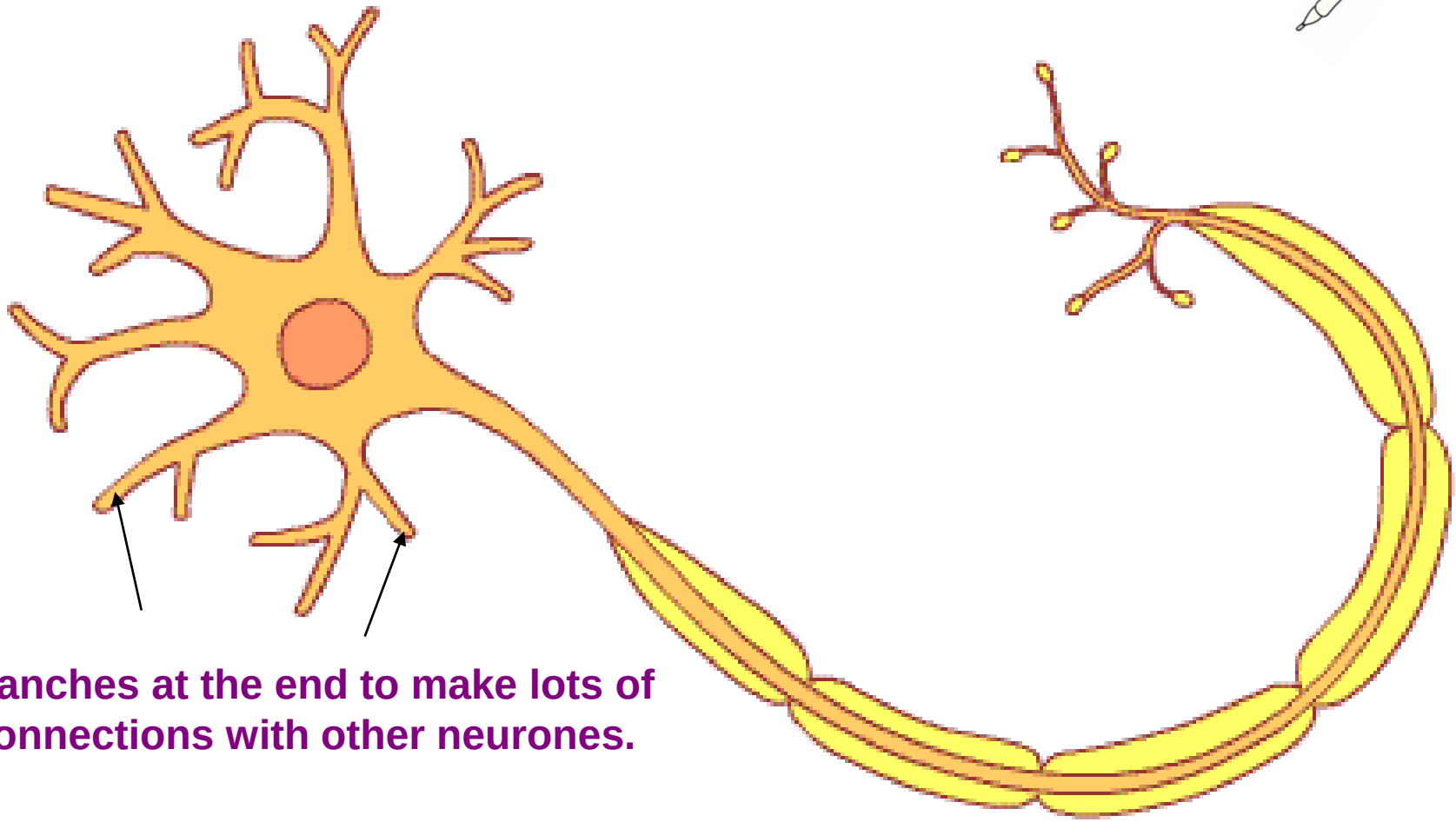
How are neurones adapted to carry out their job?

- Long to carry information long distances
- Branches at the end to make lots of connections with other neurones.



* Neurone

WS 2.8c



Branches at the end to make lots of connections with other neurones.

Long to carry information long distances

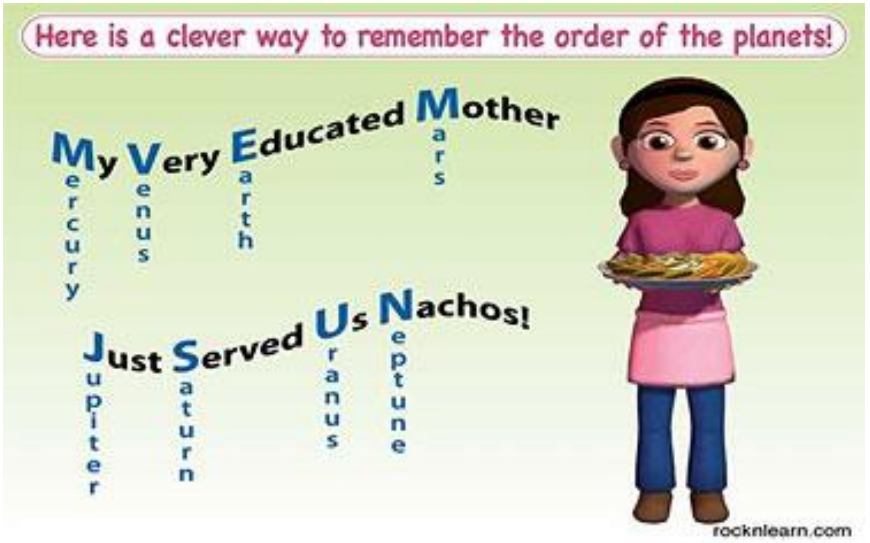
Mark the adaptations on the diagram

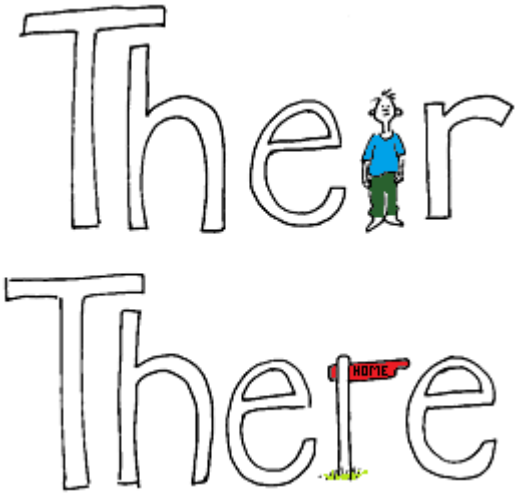

LEARNING INTENTIONS
WE ARE LEARNING...
TO DEVELOP STRATEGIES
TO IMPROVE MEMORY

STARTER

Discuss in pairs which method you find most useful to remember lists of information.

*how do you remember?

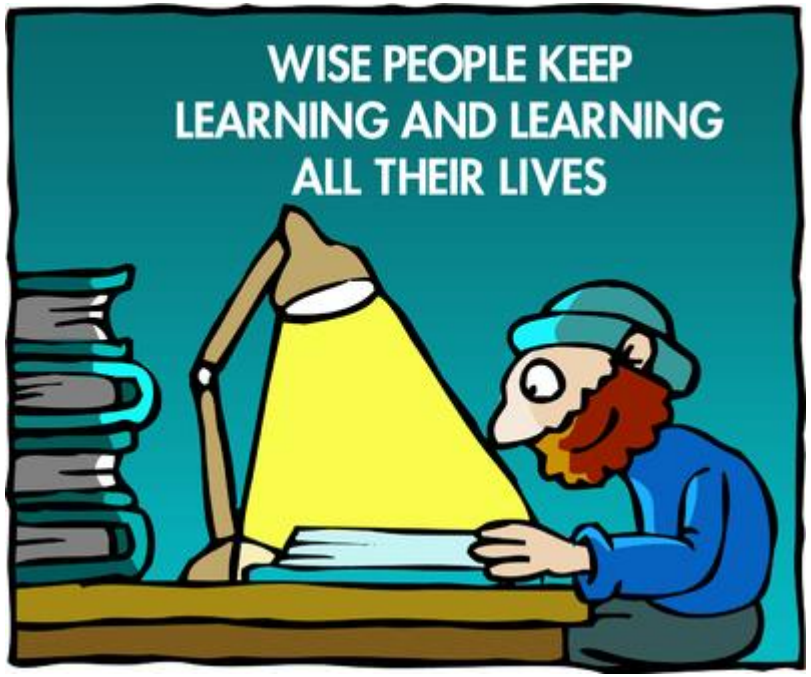




LEARNING

Learning involves getting information into long-term memory!

It is a measurable and relatively permanent change in behaviour through experience, instruction, or study.

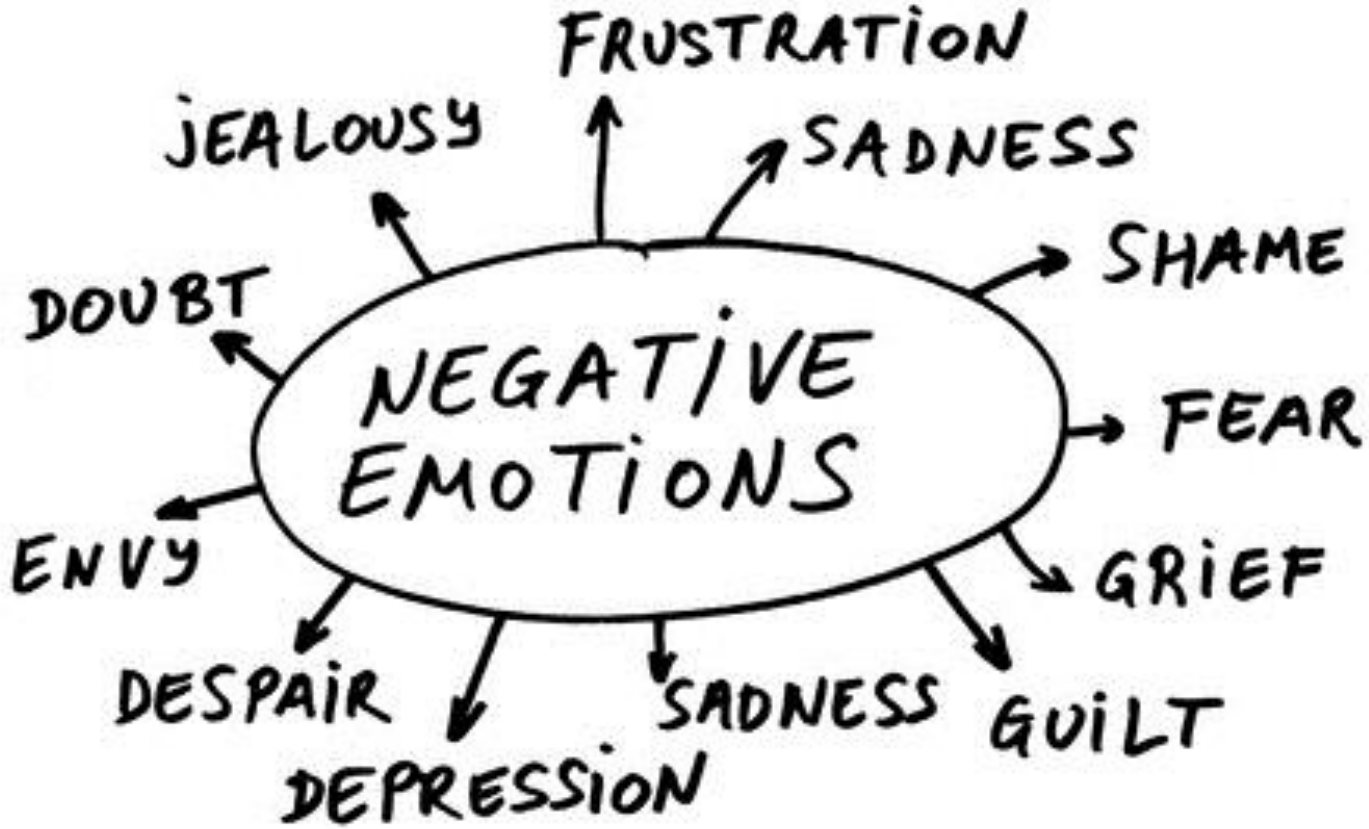


* What factors could affect learning?

*

how can you make
your learning environment better?

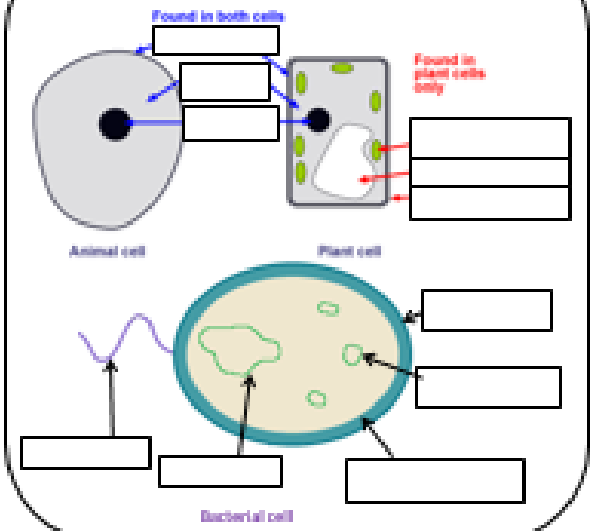
*emotions


FRUSTRATION
JEALOUSY
SADNESS
SHAME
DOUBT
NEGATIVE EMOTIONS
FEAR
ENVY
GRIEF
DESPAIR
SADNESS
GUILT
DEPRESSION

Unit 2 – Who am I & the Brain Revision Mind map

WS 2.10

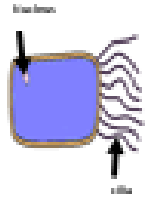
Label the diagrams below (spelling must be correct)



Complete the table below:

Structure	Function	Found in Plant cells?	Found in animal cells?	Found in bacterial cells?
Nucleus				
Cytoplasm				
Cell membrane				
Cell wall				
Chloroplast				
Vacuole				
Loop of DNA				
Plasmid				
Flagellum				

Specialised Cells

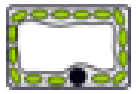


Name:
Function:
Adaptation:

Name:
Function:
Adaptation:

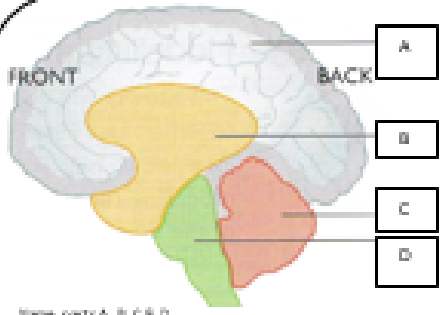
Name:
Function:
Adaptation:

Name:
Function:
Adaptation:



Name:
Function:
Adaptation:

Name:
Function:
Adaptation:



Name parts A, B, C & D

A _____

B _____

C _____

D _____

What is the function of each:

A _____

B _____

C _____

D _____

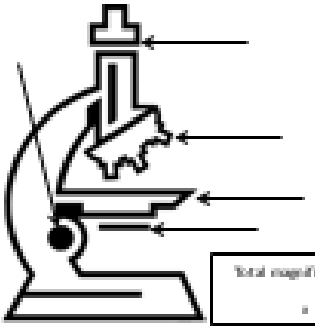
List the seven characteristics of life.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Preparation of slides

1. What reagent do you add to onion tissue so that the onion cells are easier to see under the microscope? _____
2. What reagent do you add to cheek cells so that they are easier to see under the microscope? _____ _____
3. Why is it necessary to lower the coverslip onto the slide slowly? _____ _____

Label the diagram of the microscope below:



Total magnification =

x