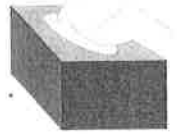


Life and Cells

Q1 Sort the following list by writing each term in the correct place in the table below.

- | | | | |
|---------------------|------------------|------------------|---------|
| sperm | blood | digestive system | tree |
| cat | liver | egg (human) | stomach |
| reproductive system | muscle | eye | fungus |
| excretory system | white blood cell | heart | leaf |



Cell	Tissue	Organ	Organ system	Organism

Q2 State what the following cell structures **contain** or are **made of** and what their **functions** are.

- a) The **nucleus** contains
- Its function is
- b) **Chloroplasts** contain
- Their function is
- c) The **cell wall** is made of
- Its function is

Q3 Tick the boxes to show whether the following statements are **true** or **false**.

- a) A leaf is an organ.
- b) Organisms have only one organ system.
- c) Palisade cells are present in leaf tissue.
- d) Mitochondria are where most of the respiration reactions take place.
- e) A heart contains different types of tissue.

True	False
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>



Q4 Plant and animal cells have **similarities** and **differences**. Complete each statement below by choosing the correct words.

- a) **Plant** / **animal** cells, but not **plant** / **animal** cells, contain chloroplasts.
- b) Plant cells have a **vacuole** / **cell wall**, which is made of cellulose.
- c) **Both plant and animal cells** / **Only plant cells** / **Only animal cells** contain mitochondria.
- d) Chloroplasts are where **respiration** / **photosynthesis** occurs, which makes **glucose** / **water**.

Specialised Cells

Q1 Give the correct name for each of the specialised cells described below.

- a) These cells transport oxygen around the body.
- b) Cells with many chloroplasts for photosynthesis.
- c) The male reproductive cell.
- d) Cells that open and close stomata on leaves.
- e) The female reproductive cell.

Q2 Below are three features of **palisade leaf cells**. Draw lines to match each feature to its function.

Lots of chloroplasts	gives a large surface area for absorbing CO ₂
Tall shape	means you can pack more cells in at the top of the leaf
Thin shape	for photosynthesis

Q3 Complete the following paragraph about **guard cells**, using the words below.

night turgid flaccid photosynthesis stomata



Guard cells open and close the When the plant has lots of water the guard cells are This makes the stomata open, so gases can be exchanged for When the plant is short of water the guard cells become , making the stomata close. They also close at to save water.

Q4 Red blood cells are adapted to **carry oxygen**.

- a) What **shape** are red blood cells?
- b) How does the shape of the cell help it carry oxygen?
.....
- c) Why do the cells have **no nucleus**?
.....



Q5 Below is a list of features of **reproductive cells**. Decide which ones are found in **sperm** cells and which ones are found in **egg** cells.

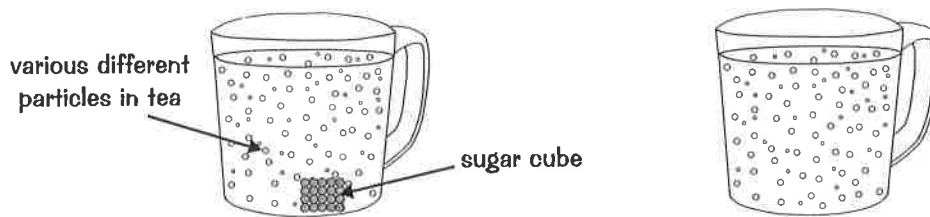
	Sperm	Egg
a) A long tail	<input type="checkbox"/>	<input type="checkbox"/>
b) Enzymes to digest cell membranes	<input type="checkbox"/>	<input type="checkbox"/>
c) A large food reserve	<input type="checkbox"/>	<input type="checkbox"/>
d) Lots of mitochondria	<input type="checkbox"/>	<input type="checkbox"/>
e) A streamlined head	<input type="checkbox"/>	<input type="checkbox"/>

Diffusion

Q1 Complete the passage below by choosing the most appropriate words.

Diffusion is the **direct** / **random** movement of particles from an area where they are at a **higher** / **lower** concentration to an area where they are at a **higher** / **lower** concentration. The rate of diffusion is faster when the concentration gradient is **bigger** / **smaller** and in **liquids** / **gases**. It is slower when there is a **large** / **small** distance over which diffusion occurs and when there is **more** / **less** surface for diffusion to take place.

Q2 The first diagram below shows a **cup of tea** which has just had a **sugar cube** added.



- a) In the second cup above, draw the appearance of the molecules of **sugar** in the tea after an hour.
- b) Predict how the rate of diffusion of the sugar would change in each of the following situations:
- i) sugar crystals are used rather than a sugar cube

.....

- ii) the tea is heated

.....

- iii) the sugar and tea are placed in a long thin tube

.....

- c) Explain the movement of the sugar particles in terms of areas of different concentration.

.....

Q3 Patsy was studying in her bedroom. Her dad was cooking curry for tea in the kitchen. Soon Patsy could smell the curry that her dad was making.

- a) Her dad was warm so he switched on a fan. Suggest what effect the fan would have on the rate that the curry particles spread through the house.

.....

- b) After tasting the curry, Patsy's dad added more curry powder. What effect would this have on the smell of the curry? Explain your answer using the word **concentration**.

.....

Diffusion

Q4 Some statements about **diffusion** are written below. Decide which are correct and then write **true** or **false** in the spaces.

- a) Diffusion takes place in all types of substances.
- b) Diffusion is usually quicker in liquids than in gases.
- c) Diffusion happens more quickly when there is a higher concentration gradient.
- d) A larger surface area makes diffusion happen more quickly.
- e) When there is a larger distance this speeds up the rate of diffusion.

Q5 Two models of diffusion are shown below.



- a) i) Would you expect the molecules to diffuse **faster** in situation A or B?
- ii) Explain your answer.

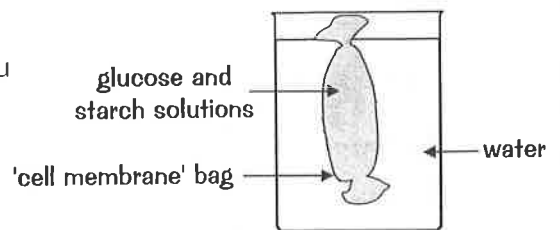
.....

Q6 Phil was investigating the diffusion of **glucose** and **starch** through a **membrane**. He placed equal amounts of glucose solution and starch solution inside a bag designed to act like a cell membrane. He then put the bag into a beaker of water.

- a) After 20 minutes, Phil tested the water for the presence of starch and glucose. Circle which of the following you would expect to be found in the water outside the bag:

glucose

starch



- b) Explain your answer to part a).

.....

.....

- c) Phil did the experiment again using the same amounts of glucose and starch solutions. This time he used a much longer, thinner bag.

Will the diffusion happen faster or more slowly this time?
Explain your answer.



Think about the surface areas of the bags.

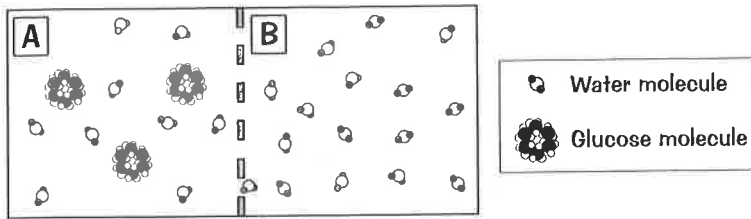
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.....

Top Tips: Don't forget it's only small molecules that can diffuse through cell membranes, e.g. glucose, amino acids, water and oxygen. Big hulking things like proteins and starch can't fit through.

Osmosis

Q1 This diagram shows a tank separated into two by a partially permeable membrane.



a) On which side of the membrane is there the higher concentration of water molecules?

.....

b) In which direction would you expect more water molecules to travel — from A to B or from B to A?

.....

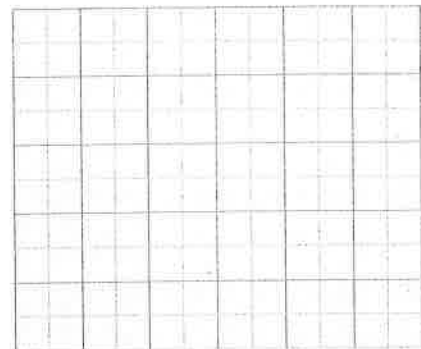
c) Predict whether the level of liquid on side B will **rise** or **fall**. Explain your answer.

The liquid level on side B will, because

.....

Q2 Some **potato cylinders** were placed in solutions of different **salt concentrations**. At the start of the experiment each cylinder was 50 mm long. Their final lengths are recorded in the table below.

Concentration of salt (molar)	Final length of potato cylinder (mm)	Change in length of potato cylinder (mm)
0	60	
0.25	58	
0.5	56	
0.75	70	
1	50	
1.25	45	



a) Plot the points for concentration of salt solution vs final length of potato cylinders on the grid.

b) Work out the change in length of each of the cylinders and complete the table above.

c) Study the pattern of the results.

i) State the salt concentration(s) that produced unexpected results.

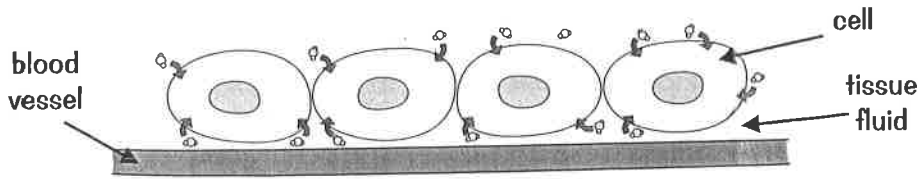
ii) Suggest a method for deciding which of the results are correct.
.....

d) State **three** factors that should have been kept constant to ensure this was a fair test.

.....
.....
.....

Osmosis

- Q3** The diagram below shows some **body cells** bathed in **tissue fluid**. A blood vessel flows close to the cells, providing water. The cells shown have a low concentration of water inside them.



- a) Is the concentration of water higher in the **tissue fluid** or inside the **cells**?

.....

- b) In which direction would you expect more water to travel — **into** the cells or **out of** the cells? Explain your answer.

.....

- c) i) Explain why osmosis appears to stop after a while.

.....

- ii) Would you expect the tissue fluid to be **more dilute** or **more concentrated** than the cells at this point? Why?

.....

- Q4** Joan was making a meal of **salted ham** and **fruit salad**. She covered the meat in water and left it to soak for a few hours. When she returned, the meat was much bigger in size.

- a) Use the term **osmosis** to help you explain the change in appearance of the ham.

.....



- b) To make her fruit salad, Joan cut some oranges, raisins and sultanas, sprinkled sugar over them and left them overnight. When she examined the fruit next morning they were surrounded by a **liquid**.

- i) Suggest what the liquid might be.

- ii) Explain where the liquid has come from.

.....

- iii) Joan then washed the fruit and observed that the raisins and sultanas once again became swollen. Explain what has happened this time.

.....
