

Movement in and out of cells

Question Paper 1

Level	IGCSE
Subject	Biology (0610/0970)
Exam Board	Cambridge International Examinations (CIE)
Topic	Movement in and out of cells
Sub-Topic	Movement in and out of cells
Booklet	Question Paper 1

Time Allowed: 46 minutes

Score: /38

Percentage: /100

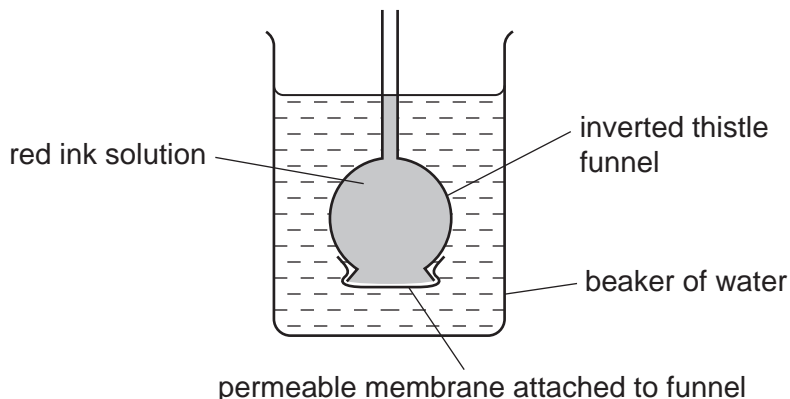
Grade Boundaries:

9	8	7	6	5	4	3	2	1
>85%	75%	68%	60%	53%	48%	40%	33%	<25%

1. Active transport is the movement of

- A** molecules from a region of their higher concentration to a region of their lower concentration.
- B** particles from a region of lower concentration to a region of higher concentration using energy from respiration.
- C** urine by relaxation of a sphincter muscle in the bladder.
- D** water through a partially permeable membrane from a more dilute to a more concentrated solution.

2. The diagram shows an experiment to demonstrate the movement of molecules.

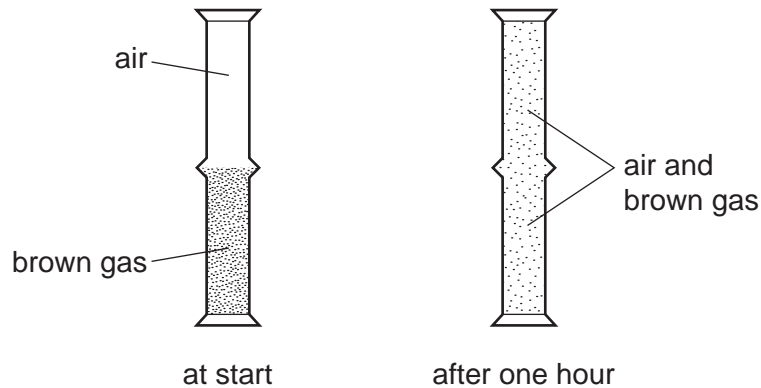


After one hour, the water in the beaker turned red.

What is the most likely reason for this colour change?

- A** Molecules of red ink move through the membrane by diffusion.
- B** Molecules of red ink move through the membrane by osmosis.
- C** Molecules of water move through the membrane by diffusion.
- D** Molecules of water move through the membrane by osmosis.

5. A jar of air was placed upside down on top of a jar containing a brown gas as shown.

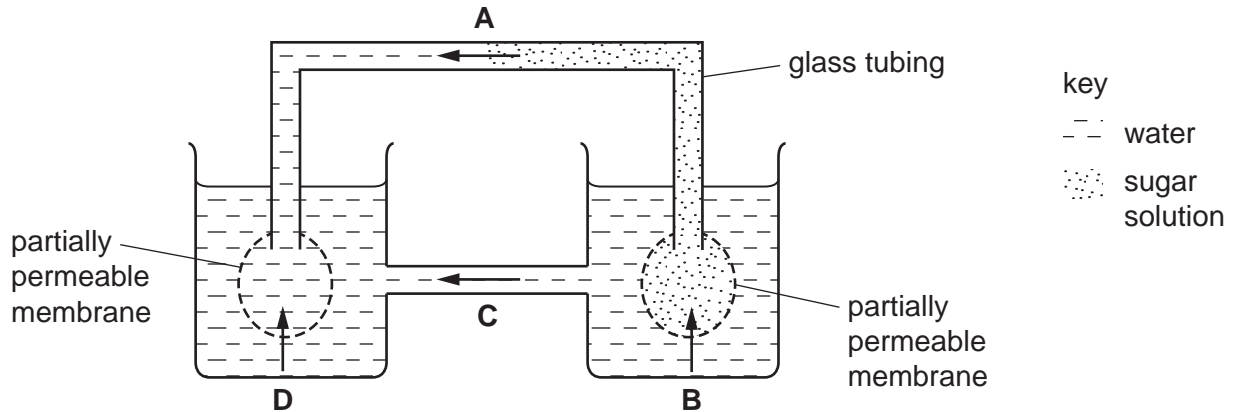


Which process has taken place?

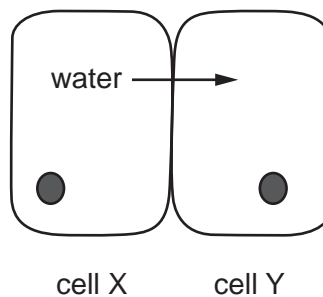
- A** diffusion both upwards and downwards
 - B** diffusion downwards only
 - C** diffusion upwards only
 - D** diffusion and osmosis
6. Which statement describes how young plants are supported?
- A** the pressure of water inside the cells pressing outwards on the cell membranes
 - B** the pressure of water inside the cells pressing outwards on the cell walls
 - C** the pressure of water passing from the roots through the phloem
 - D** the pressure of water passing from the roots through the xylem

7. The diagram shows an experiment on osmosis.

Which arrow shows the direction of the net movement of water at the start of the experiment?



8. The diagram shows two cells. The net movement of water is from cell X to cell Y.



What causes water to pass from cell X to cell Y?

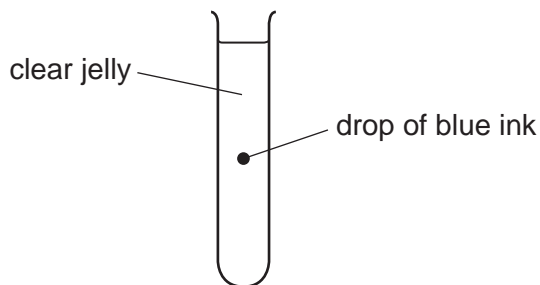
- A water potential is higher in cell X and active transport occurs
- B water potential is higher in cell X and osmosis occurs
- C water potential is lower in cell X and active transport occurs
- D water potential is lower in cell X and osmosis occurs

9. Small molecules are used as the basic units in the synthesis of large food molecules.

Which statement is correct?

- A Amino acids are basic units of carbohydrates.
- B Fatty acids are basic units of glycogen.
- C Glycerol is a basic unit of oils.
- D Simple sugar is a basic unit of protein.

10. The diagram shows a test-tube containing clear jelly. A drop of blue ink is injected into the middle of the jelly.

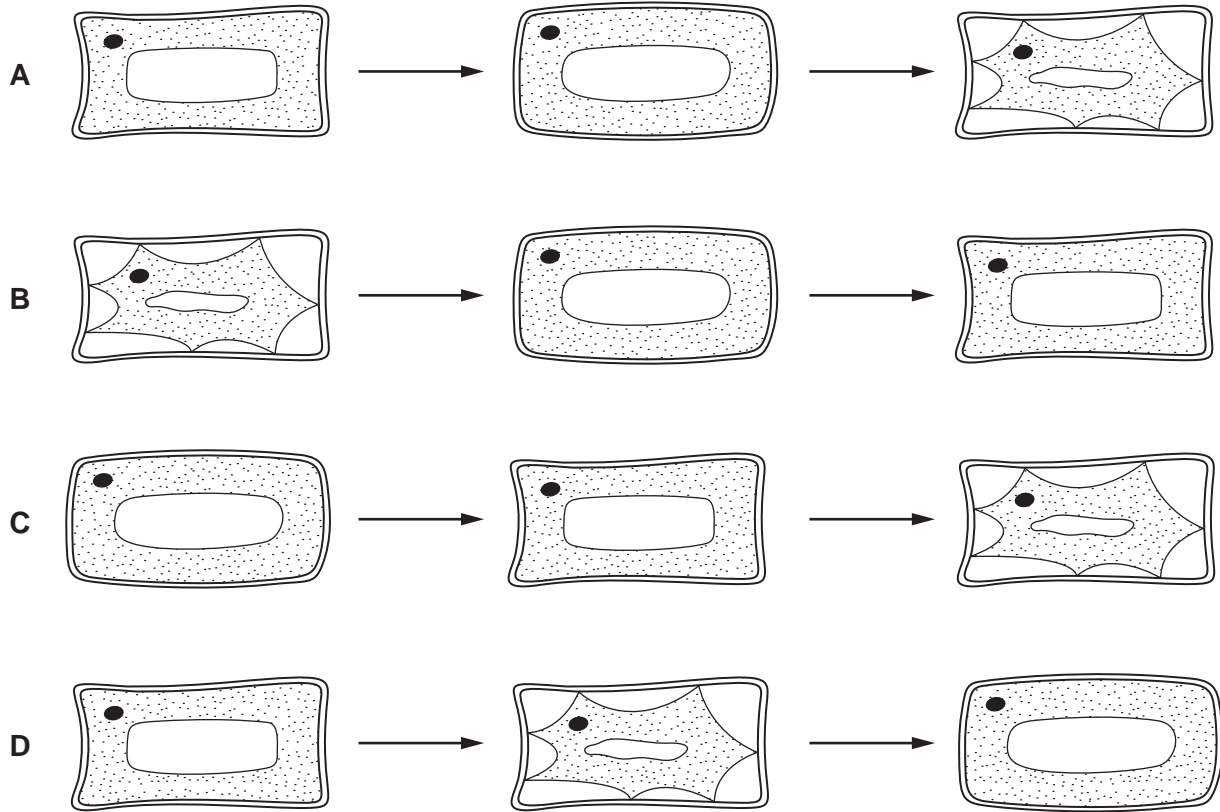


The blue colour of the ink spreads throughout the jelly.

By which process does the blue ink spread through the jelly?

- A active transport
- B catalysis
- C diffusion
- D osmosis

11. Which diagram shows the changes in appearance of a plant cell when it remains in a concentrated sugar solution for thirty minutes?



12. The data show the results of an investigation on osmosis using sticks of potato.

concentration of sugar solution / mol per dm ³	length of potato stick at start / mm	length of potato stick after 24 hours / mm
0.6	60	54

Which statements explain this change in length?

	movement of water	cause of the movement
A	into the potato cells	The sugar solution has a higher water potential than the potato cells.
B	into the potato cells	The sugar solution has a lower water potential than the potato cells.
C	out of the potato cells	The sugar solution has a higher water potential than the potato cells.
D	out of the potato cells	The sugar solution has a lower water potential than the potato cells.

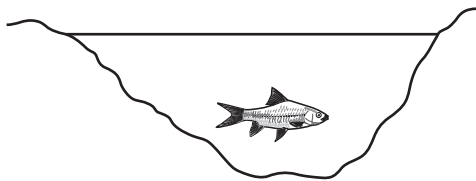
13. What causes the diffusion of oxygen into a plant cell?

- A** active transport
- B** movement of molecules
- C** osmosis
- D** photosynthesis

14. What is **not** an example of active transport?

- A absorption of water by root hairs
- B reabsorption of glucose by kidney tubules
- C uptake of glucose by villi
- D uptake of ions by root hairs

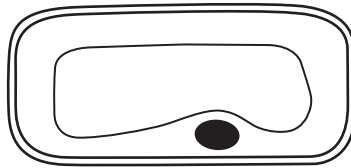
15. The diagram shows a fish in a pond.



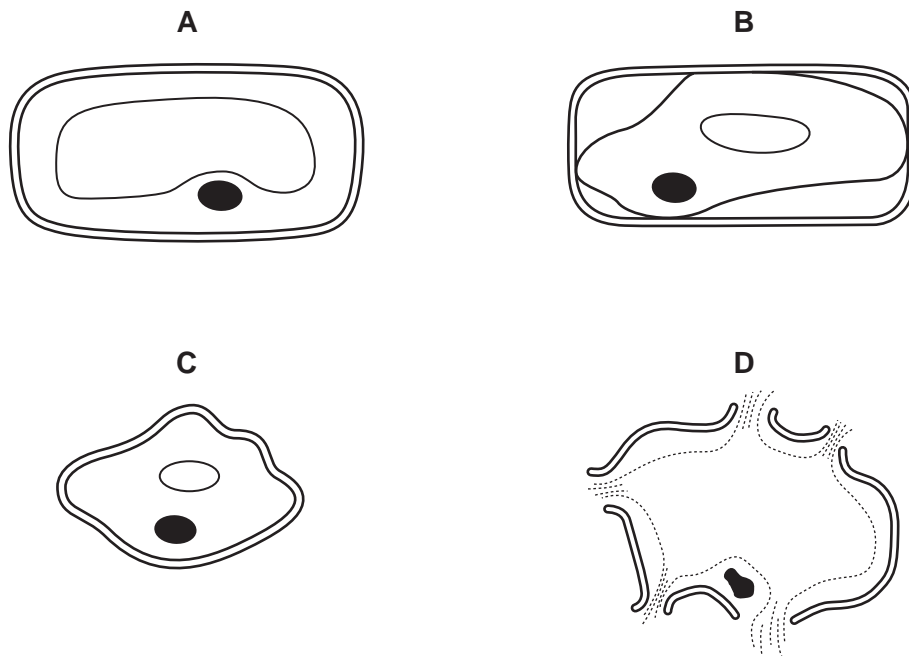
Why does oxygen diffuse from the air into the water before reaching the fish?

- A Oxygen is more concentrated in the air than in the water.
 - B Oxygen is more concentrated in the water than in the air.
 - C Oxygen is needed by the fish for aerobic respiration.
 - D Oxygen is needed by the fish for anaerobic respiration.
16. Which structure provides the best surface for diffusion?
- A atrium
 - B bronchioles
 - C ileum
 - D trachea

17. The diagram shows a plant cell.

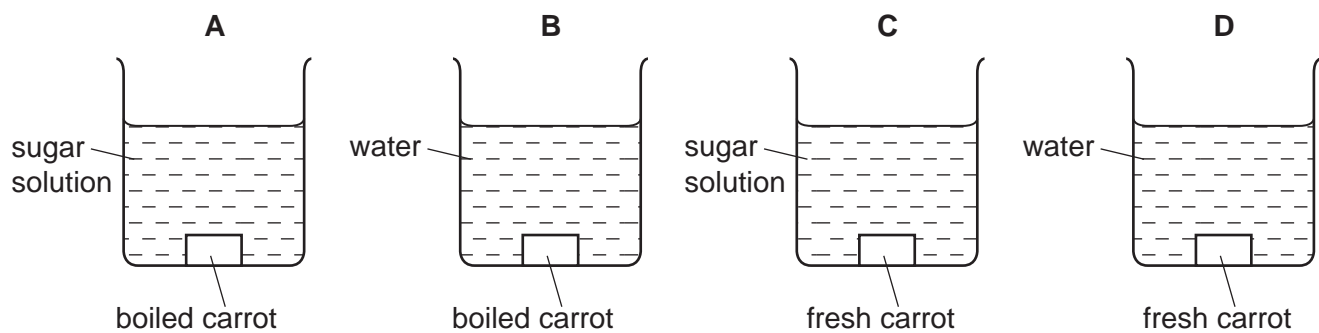


What is the appearance of this cell after it has been placed in pure water for 30 minutes?

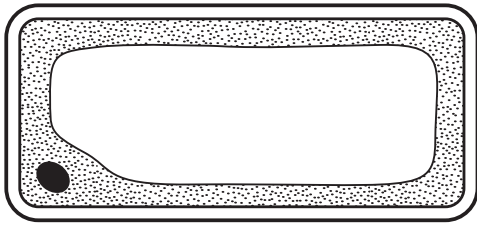


18. A student cuts out four pieces of carrot root of equal size. The pieces are treated as shown in the diagram, and then left for two hours.

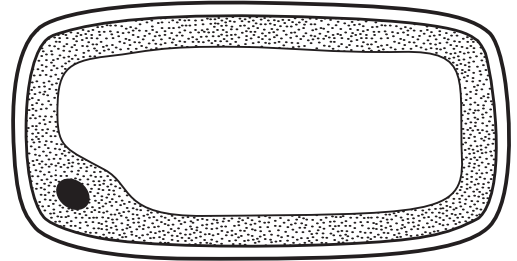
After two hours, which piece of carrot will be the smallest?



19. The diagrams show how a cell appears under the microscope at the start of an experiment and after it has been placed in a dilute solution of salts for 5 minutes.



start of the
experiment

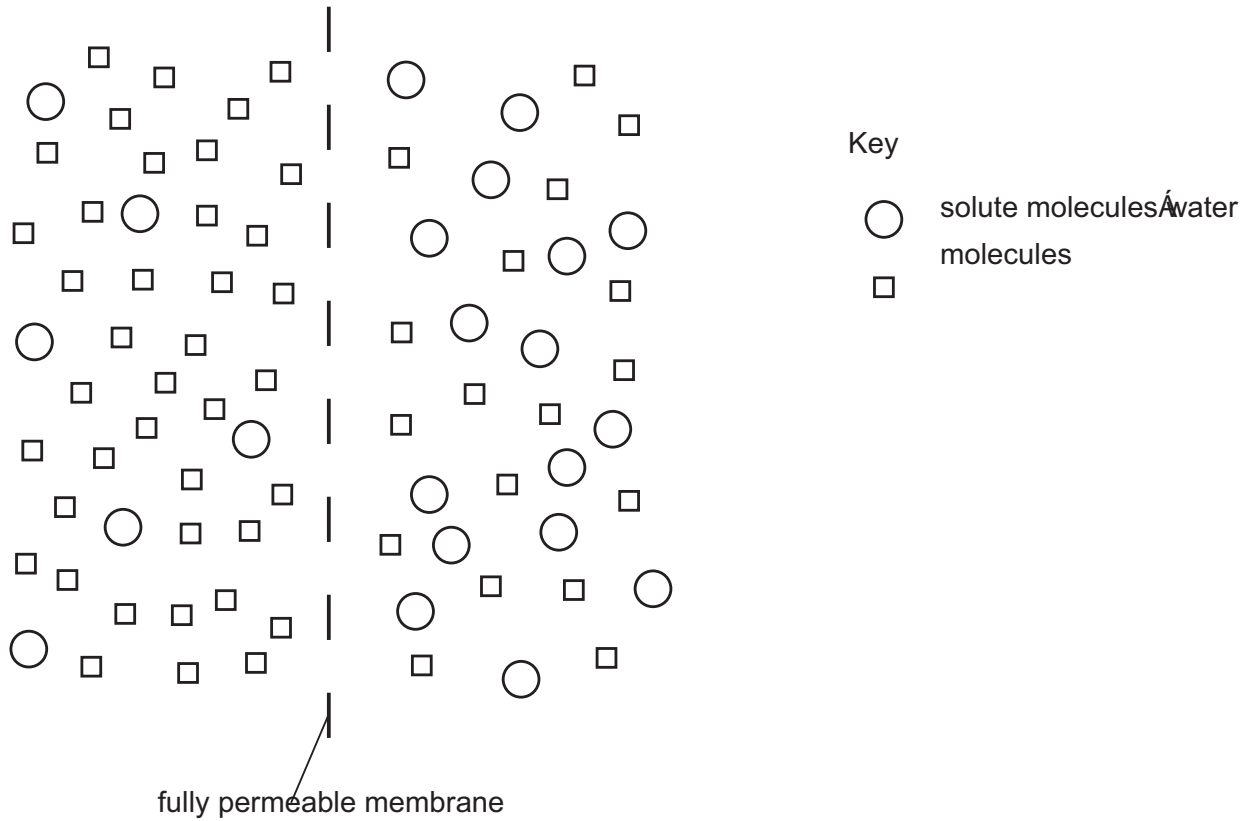


after placing in a dilute
solution of salts

Which statement explains what happens?

- A Dissolved salts enter the cell by diffusion.
- B Dissolved salts leave the cell by diffusion.
- C Water enters the cell by osmosis.
- D Water leaves the cell by osmosis.

20. The diagram represents the molecules in two solutions either side of a **fully permeable** membrane.



In which directions are the net movements of the molecules?

	solute molecules	water molecules
A	left to right	left to right
B	left to right	right to left
C	right to left	left to right
D	right to left	right to left

21. How do carbon dioxide and oxygen move in and out of a mesophyll cell?

- A active transport
- B diffusion
- C respiration
- D transpiration

22. During osmosis, which molecules move and through which type of membrane?

	molecules moving	type of membrane
A	oxygen	partially permeable
B	oxygen	permeable
C	water	partially permeable
D	water	permeable

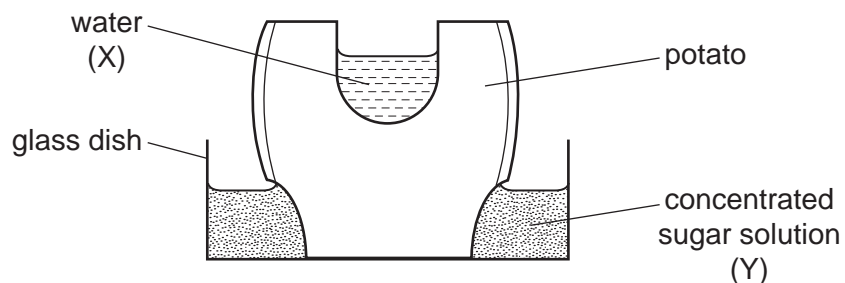
23. Which process in humans does **not** use energy released from respiration?

- A cell division
- B diffusion of oxygen
- C muscle contraction
- D protein synthesis

24. Which statements are correct for **both** diffusion and osmosis?

	involves movement of water only	requires energy from the cell	molecules move from higher concentration to lower concentration
A	✓	✓	✓
B	✓	✓	✗
C	✗	✗	✓
D	✗	✗	✗

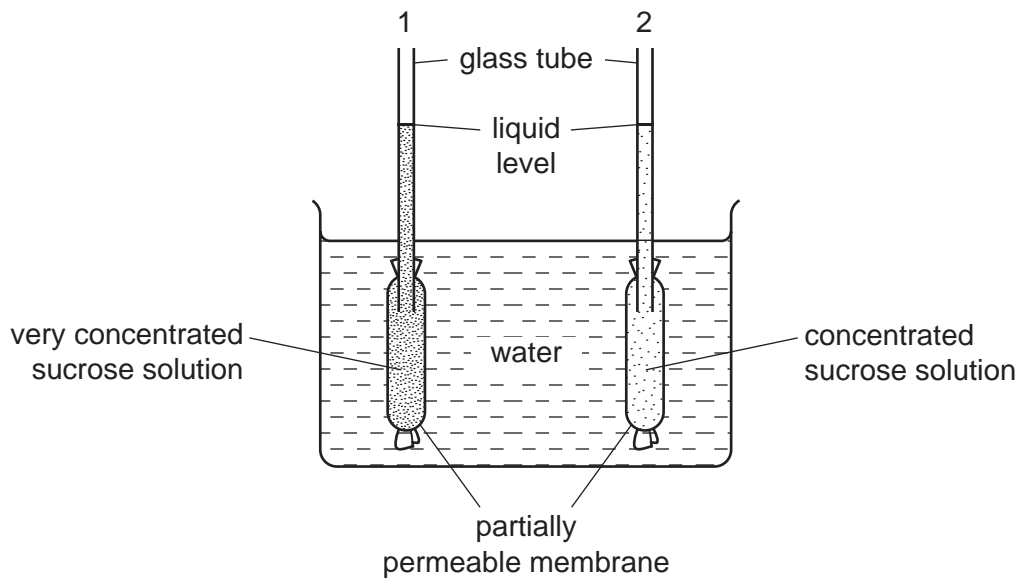
25. The diagram shows an experiment set up to investigate osmosis in living cells.



What happens to the volumes of water (X) and sugar solution (Y) after 12 hours?

	volume of water (X)	volume of sugar solution (Y)
A	decreases	increases
B	increases	increases
C	increases	remains the same
D	remains the same	decreases

26. The diagram shows apparatus which can be used to demonstrate osmosis.



After one hour, what would happen to the liquid levels in the glass tubes?

	level in tube 1	level in tube 2
A	falls	falls
B	falls	rises
C	rises	falls
D	rises	rises

27. By which process does oxygen pass out of a leaf?

- A diffusion
- B osmosis
- C translocation
- D transpiration

28. Which characteristics are correct for **both** osmosis and diffusion?

	require a partially permeable membrane	require a concentration gradient	are energy consuming processes
A	✓	✓	x
B	✓	x	✓
C	x	✓	x
D	x	x	✓

29. How does oxygen move from the alveoli into the blood?

- A by diffusion
- B by evaporation
- C by osmosis
- D by transpiration

30. Which process occurs by osmosis?
- A** plant roots absorbing mineral ions from the soil
 - B** plant roots absorbing water from the soil
 - C** the small intestine absorbing fatty acids into the blood
 - D** the small intestine absorbing glucose into the blood

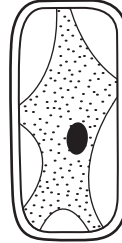
31. Red blood cells were placed in a dilute solution.

Movement of water across the cell membrane caused a change in their appearance.

What explains this movement?

	direction of water movement	from higher to lower water potential	from lower to higher water potential
A	in	✓	x
B	in	x	✓
C	out	✓	x
D	out	x	✓

32. The diagram shows a cell.



Which type of cell does the diagram show?

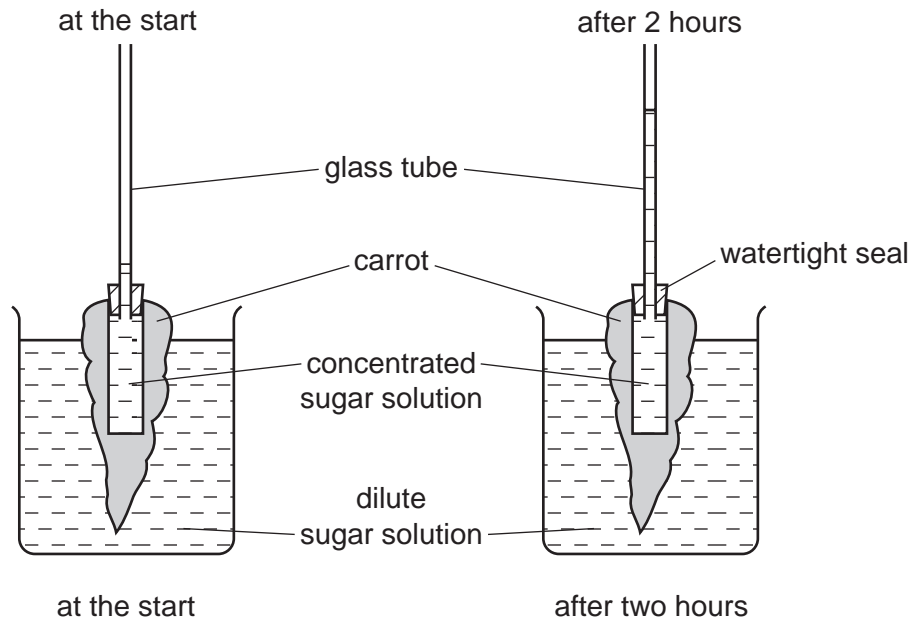
- A** an animal cell in a concentrated solution of salts
- B** an animal cell in pure water
- C** a plant cell in a concentrated solution of salts
- D** a plant cell in pure water

33. Two identical cylinders, 40 mm long, are cut from a potato. One (W) is placed in water and the other (X) is placed in a concentrated sugar solution.

What are the lengths of the cylinders after two hours?

	length of cylinder / mm	
	W	X
A	38	40
B	38	42
C	40	42
D	42	38

34. The diagram shows the movement of a concentrated sugar solution up a glass tube. The glass tube is connected firmly to a hollowed-out carrot.



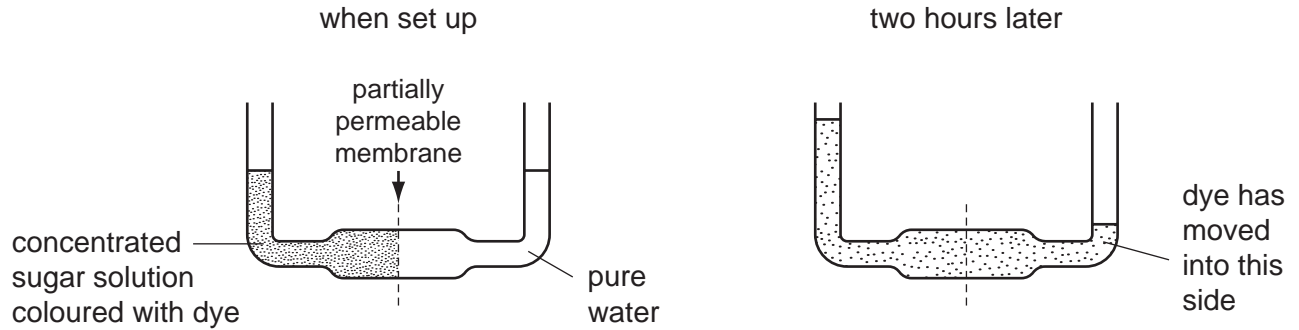
Why does the sugar solution in the glass tube rise?

- A** Sugar molecules move across the carrot tissue into the glass tube.
 - B** Sugar molecules move across the carrot tissue into the beaker.
 - C** Water molecules move across the carrot tissue into the glass tube.
 - D** Water molecules move across the carrot tissue into the beaker.
35. A plant absorbs water and oxygen into its roots.

How are these substances absorbed?

	water	oxygen
A	diffusion	transpiration
B	osmosis	diffusion
C	transpiration	osmosis
D	transpiration	transpiration

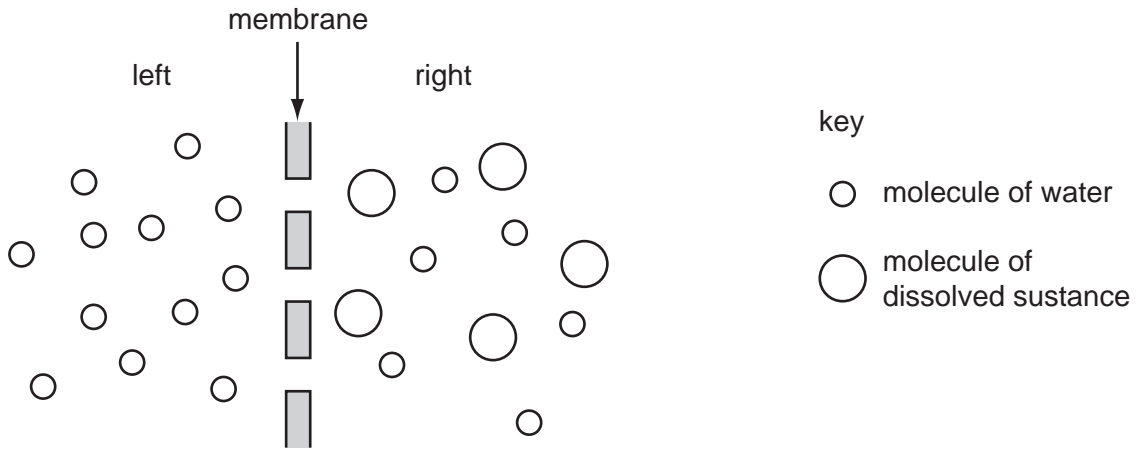
36. The diagrams show an experiment when set up and the same experiment two hours later.



What explains the movement of water and dye?

	movement of water	movement of dye
A	diffusion	osmosis
B	osmosis	diffusion
C	osmosis	translocation
D	translocation	diffusion

37. The diagram represents two liquids, separated by a membrane through which osmosis can occur.



What movement of molecules will occur?

- A Molecules of dissolved substance move from left to right.
- B Molecules of dissolved substance move from right to left.
- C Overall, water molecules move from left to right.
- D Overall, water molecules move from right to left.

38. The diagram shows part of a section through a leaf.

Which arrow shows the direction of movement of water by osmosis in a leaf?

