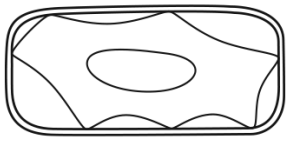
3.2 Osmosis

01. 0610_m22_qp_22 Q: 6

The diagram shows a plant cell after it has been submerged in a solution, P, for 20 minutes.



Which row describes the water potential of solution P at the start of the experiment and the condition of the cell after 20 minutes?

	water potential of solution P at the start of the experiment	condition of the cell after 20 minutes
A	higher than the inside of the cell	plasmolysed and turgid
B	higher than the inside of the cell	under high turgor pressure
C	lower than the inside of the cell	plasmolysed and flaccid
D	the same as the inside of the cell	under low turgor pressure

---

02. 0610_w21_qp_21 Q: 6

Which statement about turgor pressure is correct?

A It creates a pull in the xylem which allows water to move upwards.

B It allows sucrose and amino acids to travel upwards and downwards in the phloem.

C It is a pressure that is only found in cells containing chloroplasts.

D It is pressure that helps to provide support for plants.

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03. 0610_w21_qp_23 Q: 7

Which statement about the role of the pressure of water in supporting plants is correct?

A The pressure of water inside the cells presses inwards on the cell wall.

B The pressure of water outside the cells presses inwards on the cell wall.

C The pressure of water inside the cells presses outwards on the cell wall.

D The pressure of water outside the cells presses outwards on the cell wall.

---

04. 0610_m20_qp_22 Q: 7

Which row describes osmosis?

	movement of water	energy from respiration used	movement through a partially permeable membrane
A	✓	✓	✗
B	✓	✗	✓
C	✗	✓	✗
D	✗	✗	✓

key

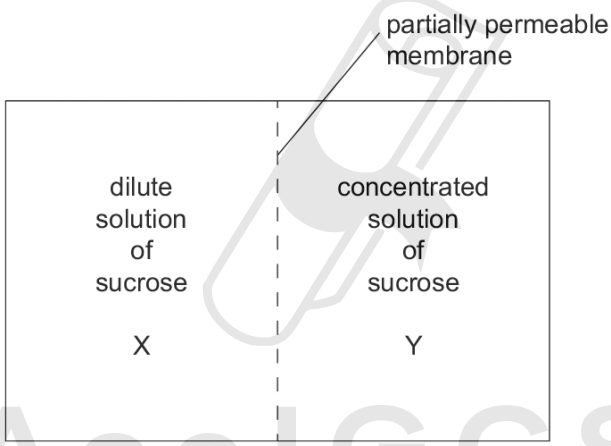
✓ = yes

✗ = no

---

05. 0610_p20_qp_20 Q: 5

The diagram shows two solutions that are separated by a partially permeable membrane.



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In which direction will most water molecules move in relation to their concentration gradient?

A from X to Y against their concentration gradient

B from X to Y down their concentration gradient

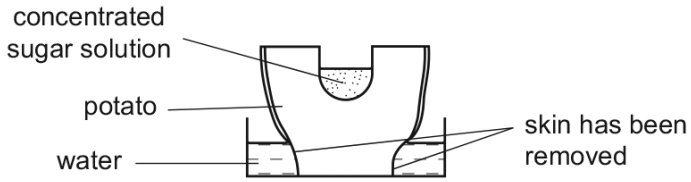
C from Y to X against their concentration gradient

D from Y to X down their concentration gradient

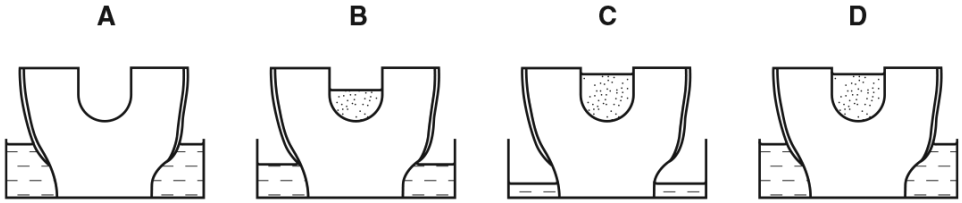
---

06. 0610_p20_qp_20 Q: 7

The diagram shows an experiment using an uncooked potato. The skin of the potato was removed as shown.



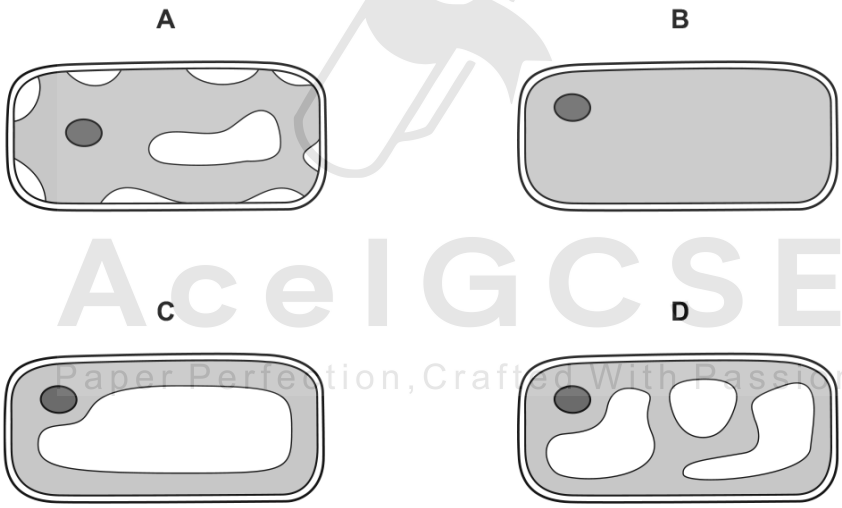
Which diagram shows the result of the experiment after 24 hours?



---

07. 0610_s20_qp_21 Q: 5

Which diagram shows the appearance of a plant cell several minutes after it has been placed in a concentrated solution of sugar?



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08. 0610_s20_qp_21 Q: 6

Plant cells are placed in a solution with a higher water potential than the plant cell contents.

What will happen?

	direction of water movement	volume of vacuole
A	enters cells	decreases
B	enters cells	increases
C	leaves cells	decreases
D	leaves cells	increases

---

09. 0610_s20_qp_22 Q: 6

An uncooked piece of potato was placed in a solution. After two hours the size of the piece of potato had decreased.

Which row explains why this has happened and how the potato cells have changed?

	water potential		potato cells become
	potato cells	external solution	
A	higher	lower	flaccid
B	higher	lower	turgid
C	lower	higher	flaccid
D	lower	higher	turgid

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10. 0610_s20_qp_23 Q: 3

Onion plant cells swell but do not burst when placed in distilled water.

Which cell component prevents the onion plant cells from bursting?

A cell membrane

B cell wall

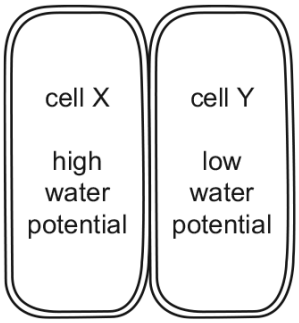
C nucleus

D vacuole

---

11. 0610_s20_qp_23 Q: 6

The diagram shows two adjacent plant cells.



Which statement describes what will happen to the water in the cells?

A equal movement between cells

B net movement from X to Y

C net movement from Y to X

D no movement between cells

---

12. 0610_w20_qp_21 Q: 5

What are features of osmosis?

	diffusion is involved	requires cell walls	requires a partially permeable membrane
A	✓	✗	✓
B	✓	✗	✗
C	✗	✓	✓
D	✗	✓	✗

key

✓ = yes

✗ = no

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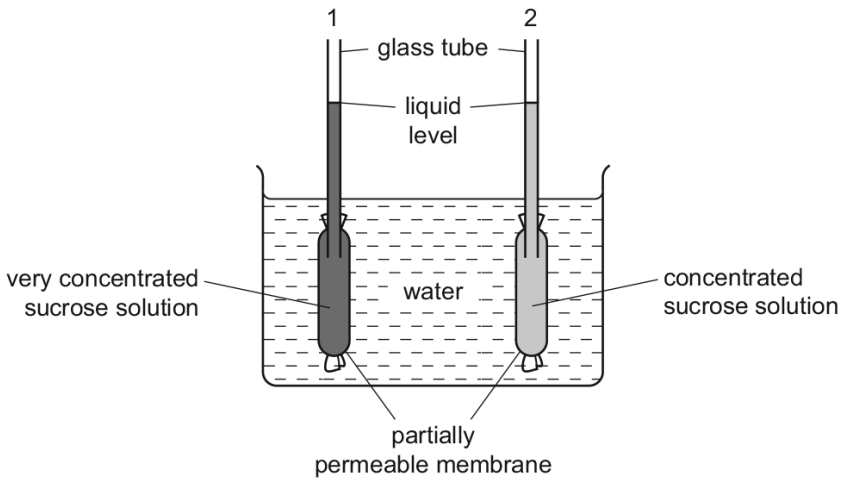
13. 0610_w20_qp_21 Q: 6

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?

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

---

14. 0610_w20_qp_22 Q: 5

What are features of osmosis?

	diffusion is involved	requires cell walls	requires a partially permeable membrane
A	✓	✗	✓
B	✓	✗	✗
C	✗	✓	✓
D	✗	✓	✗

key
✓ = yes
✗ = no

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15. 0610_m19_qp_22 Q: 8

Which process only involves the movement of water through the partially permeable membrane of a cell?

A absorption

B evaporation

C osmosis

D transpiration

---

16. 0610_s19_qp_22 Q: 7

Which process describes osmosis?

A diffusion of water through a cell wall

B diffusion of water through a partially permeable membrane

C diffusion of water through the cell sap

D diffusion of water through the cytoplasm

---

17. 0610_w19_qp_21 Q: 6

Red blood cells were placed in pure water.

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

What caused this change in appearance?

	direction of water movement	from higher to lower water potential	from lower to higher water potential
A	into cells	yes	no
B	into cells	no	yes
C	out of cells	yes	no
D	out of cells	no	yes

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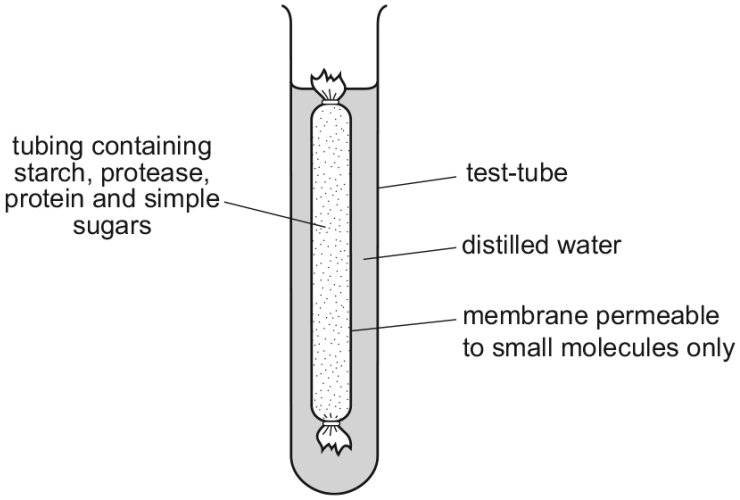
18. 0610_w19_qp_21 Q: 14

The diagram shows an experiment kept at room temperature.



What is present in the water surrounding the membrane after 45 minutes?

A amino acids and simple sugars

B protein and amino acids

C protein and simple sugars

D starch and simple sugars

---

19. 0610_w19_qp_22 Q: 6

Red blood cells were placed in pure water.

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

What caused this change in appearance?

	direction of water movement	from higher to lower water potential	from lower to higher water potential
A	into cells	yes	no
B	into cells	no	yes
C	out of cells	yes	no
D	out of cells	no	yes

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20. 0610_m18_qp_22 Q: 7

Protoplasts are plant cells that have had their cell walls removed.

What happens if plant protoplasts are placed in distilled water?

A They get larger and become turgid.

B They get larger and burst.

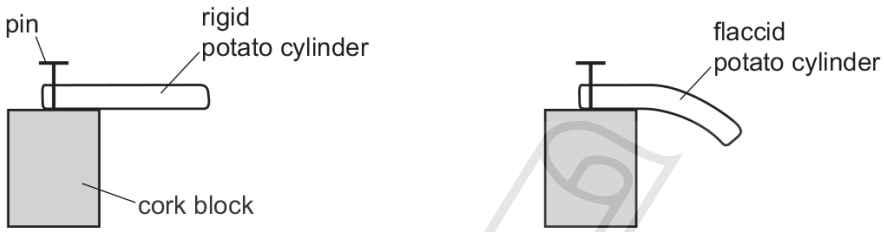
C They get smaller and become plasmolysed.

D They get smaller and shrivel up.

---

21. 0610_w18_qp_21 Q: 6

Four freshly cut potato cylinders were soaked for one hour in different salt solutions before being pinned to cork blocks. Two of the blocks are shown.



Which solution would cause the potato cylinder to be most flaccid?

A 0.1 mol per dm^3 salt solution

B 0.3 mol per dm^3 salt solution

C 0.7 mol per dm^3 salt solution

D 1.0 mol per dm^3 salt solution

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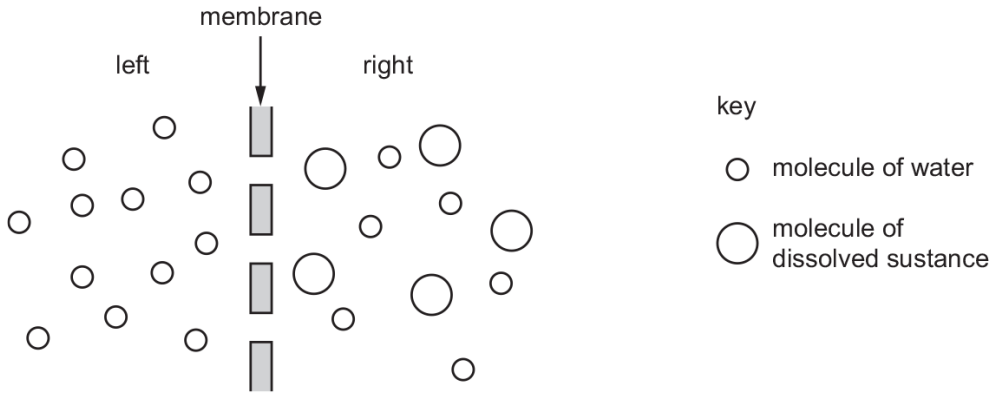
22. 0610_m17_qp_22 Q: 7

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



Which statement describes how the molecules will move?

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.

---

23. 0610_s17_qp_21 Q: 5

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

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

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24. 0610_w17_qp_21 Q: 6

A red blood cell and a palisade mesophyll cell are placed in a solution which has a higher water potential than the cells.

What will happen to each cell?

	red blood cell	palisade mesophyll cell
A	bursts	bursts
B	bursts	gains mass
C	loses mass	gains mass
D	loses mass	loses mass

---

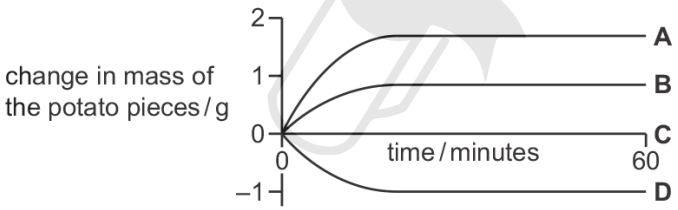
25. 0610_w17_qp_23 Q: 5

Three equally sized pieces of potato were put into different concentrations of sucrose solution. One piece of potato was put into distilled water.

The concentrations of sucrose solution were 0.2 g dm^{-3}, 0.4 g dm^{-3} and 0.6 g dm^{-3}.

The graph shows the change in mass of the potato pieces over a period of 60 minutes.

Which piece of potato was put into distilled water?



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26. 0610_m16_qp_22 Q: 5

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?

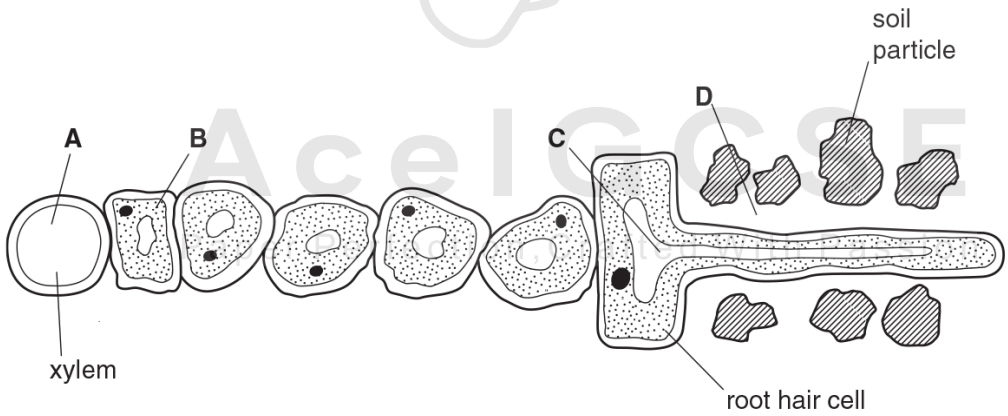
	movement of water	cause of the movement
A	into the potato cells	The sugar solution has a higher water potential than the potato cells.
B	into the potato cells	The sugar solution has a lower water potential than the potato cells.
C	out of the potato cells	The sugar solution has a higher water potential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

---

27. 0610_p16_qp_20 Q: 4

The diagram shows part of a plant root in the soil. The root is absorbing water.

At which labelled point is the water potential highest?



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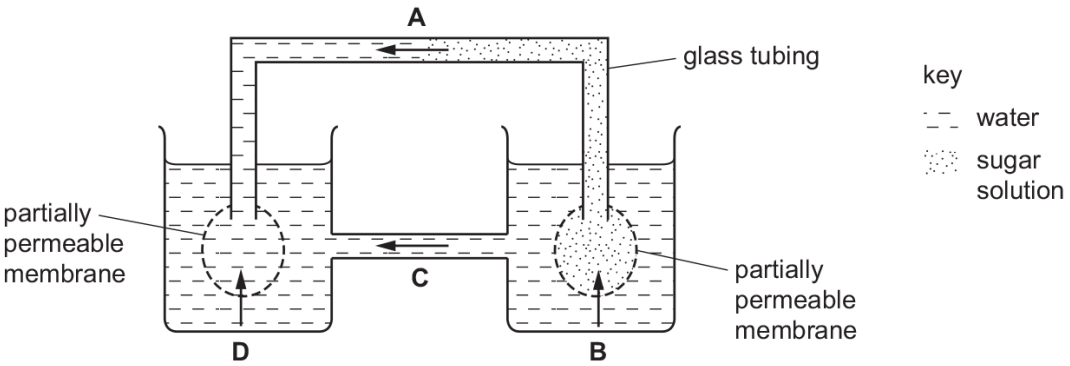
28. 0610_s16_qp_21 Q: 6

The diagram shows an experiment on osmosis.

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



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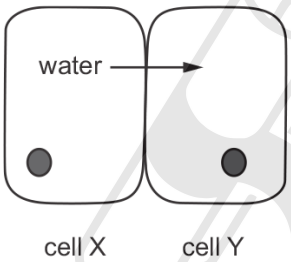
29. 0610_s16_qp_22 Q: 5

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

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30. 0610_s16_qp_23 Q: 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

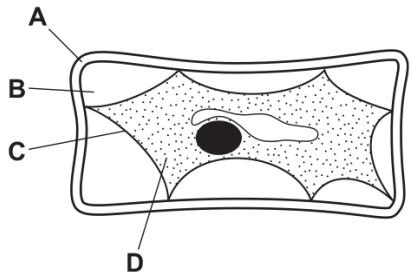
D the pressure of water passing from the roots through the xylem

---

31. 0610_w16_qp_21 Q: 6

The diagram shows a plant cell which has lost water to its surroundings by osmosis.

Which part is the partially permeable membrane?



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Answers

SN	Paper	Q. No.	Answer
01	0610_m22_qp_22	6	C
02	0610_w21_qp_21	6	D
03	0610_w21_qp_23	7	C
04	0610_m20_qp_22	7	B
05	0610_p20_qp_20	5	B
06	0610_p20_qp_20	7	C
07	0610_s20_qp_21	5	A
08	0610_s20_qp_21	6	B
09	0610_s20_qp_22	6	A
10	0610_s20_qp_23	3	B
11	0610_s20_qp_23	6	B
12	0610_w20_qp_21	5	A
13	0610_w20_qp_21	6	D
14	0610_w20_qp_22	5	A
15	0610_m19_qp_22	8	C
16	0610_s19_qp_22	7	B
17	0610_w19_qp_21	6	A
18	0610_w19_qp_21	14	A
1 9	0610_w19_qp_22	6	A
20	0610_m18_qp_22	7	B
21	0610_w18_qp_21	6	D
22	0610_m17_qp_22	7	C
23	0610_s17_qp_21	5	C
24	0610_w17_qp_21	6	B
25	0610_w17_qp_23	5	A
26	0610_m16_qp_22	5	D
27	0610_p16_qp_20	4	D
28	0610_s16_qp_21	6	B
29	0610_s16_qp_22	5	B
30	0610_s16_qp_23	6	B
31	0610_w16_qp_21	6	C

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