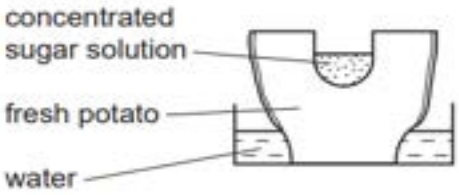
3. Movement In and Out of Cells

(Past Year Topical Questions 2010-2015)

May/June 2010 (11)

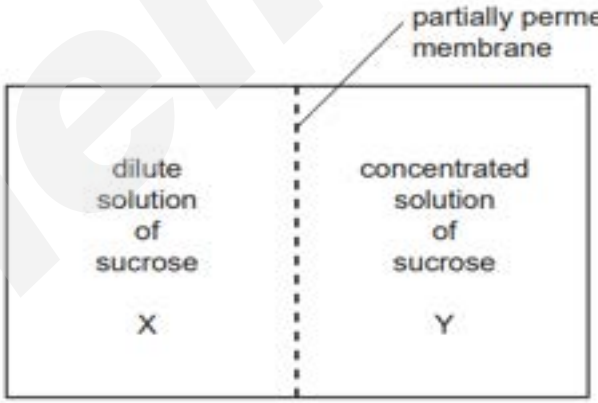
10 The diagram shows an experiment using a potato.



Which shows the result of the experiment after 24 hours?

Oct/Nov 2010 (11)

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



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

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May/June 2011 (11)

1 Which characteristic is shown when a person smells a gas in the air?

A excretion

B movement

C respiration

D sensitivity

10 Boiling potatoes destroys their cell membranes. A peeled, boiled potato strip is placed in a concentrated solution of salts.

What takes place?

	osmosis	solute diffusion
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key:
✓ = takes place
✗ = does not take place

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11 A red blood cell is placed in a concentrated sugar solution.

What happens and why?

A The cell bursts as sugar molecules diffuse into it.

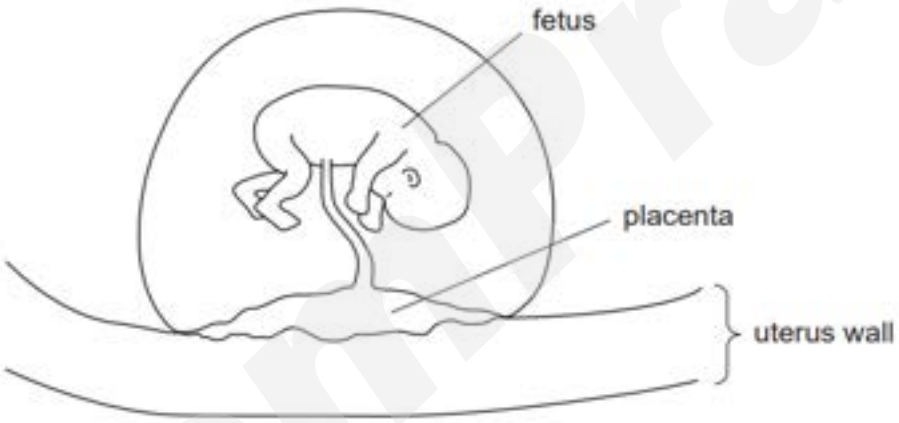
B The cell bursts because the concentrated sugar solution enters it.

C The cell shrinks because sugar molecules leave it.

D The cell shrinks because water leaves it.

Oct/Nov 2011 (11)

9 The diagram shows a fetus attached by the placenta to the uterus wall of the mother.



By which process do all substances pass between the fetus and the mother in the placenta?

A diffusion

B nutrition

C osmosis

D respiration

10 What happens in osmosis?

A movement of solute molecules against their concentration gradient

B movement of solute molecules down their concentration gradient

C movement of water molecules against their concentration gradient

D movement of water molecules down their concentration gradient

May/June 2012 (11)

10 Which structures **must** be present in a cell for osmosis to take place?

A cell (sap) vacuole and cell wall

B cell wall and cell membrane

C chloroplast and cytoplasm

D cytoplasm and cell membrane

11 A frog's skin is permeable to oxygen and carbon dioxide.

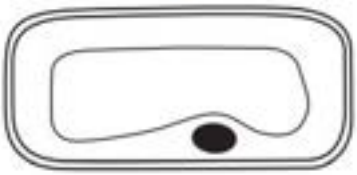
When a frog is swimming in pond water, in which directions will oxygen and carbon dioxide diffuse?

	from the frog's skin into the water	from the water into the frog's skin
A	carbon dioxide	oxygen
B	carbon dioxide and oxygen	–
C	oxygen	carbon dioxide
D	–	carbon dioxide and oxygen

May/June 2012 (12)

9 Which diagram shows the appearance of a plant cell after it is placed in distilled water?

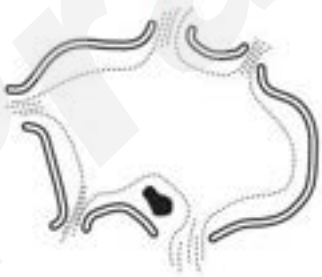
A



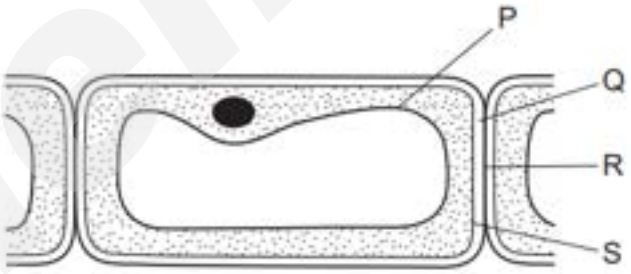
B

C

D



10 The diagram shows cells from the epidermis of a leaf.



Which parts are partially permeable?

A P and Q **B** Q and R **C** R and S **D** P and S

Oct/Nov 2012 (11)

9 Osmosis is defined as the diffusion of water molecules

A down their concentration gradient through a partially permeable membrane.

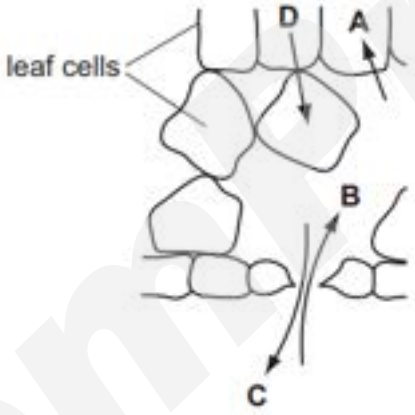
B down their concentration gradient through a permeable membrane.

C up their concentration gradient through a partially permeable membrane.

D up their concentration gradient through a permeable membrane.

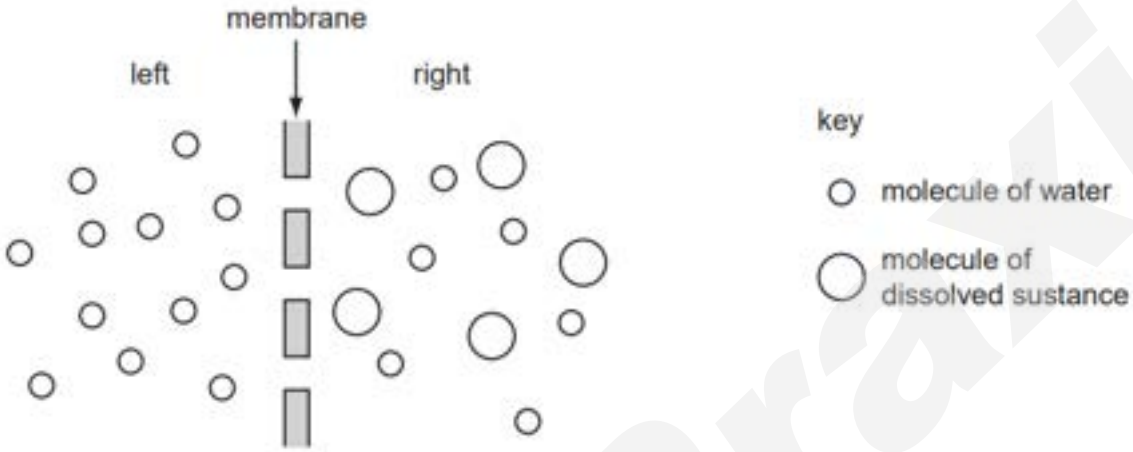
10 The diagram shows part of a section through a leaf.

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



May/June 2013 (11)

10 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.

11 The scent from a bunch of flowers spreads throughout a room.

How does the scent spread?

A by conduction

B by diffusion

C by osmosis

D by transpiration

Oct/Nov 2013 (11)

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

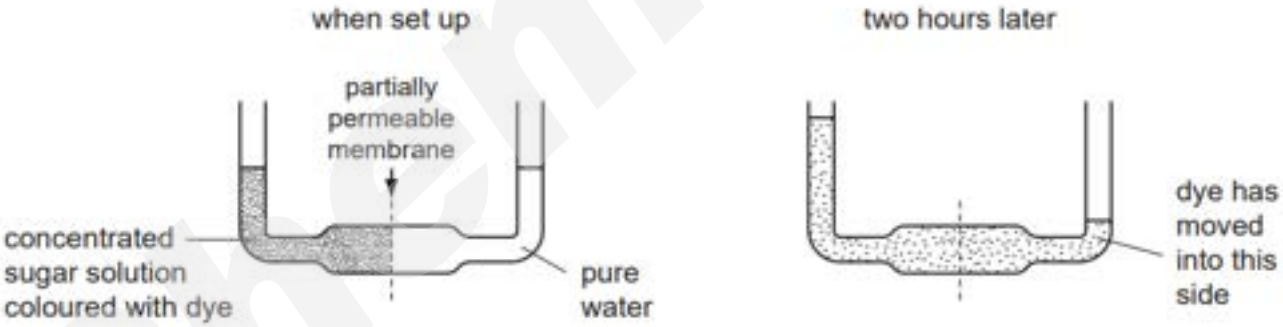
A

B

C

D

11 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

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May/June 2014 (11)

9 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

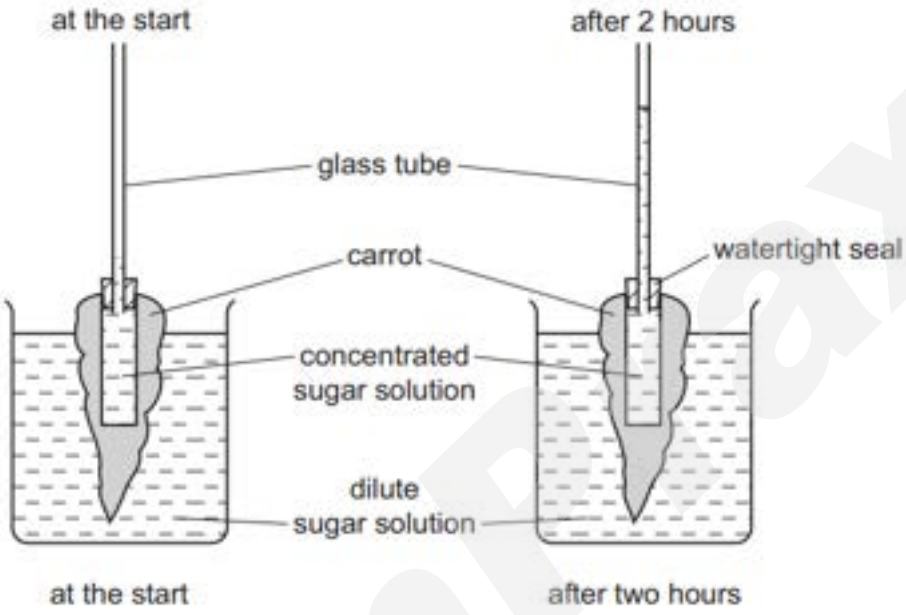
10 Two identical cylinders, 40 mm long, are cut from a potato. One (W) is placed in water and the other (X) is placed in a concentrated sugar solution.

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

May/June 2014 (12)

9 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.

10 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

+6018 – 375 2833

Oct/Nov 2014 (11)

8 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	✗	✗	✓

Oct/Nov 2014 (13)

8 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

9 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	✓	✗
B	in	✗	✓
C	out	✓	✗
D	out	✗	✓

May/June 2015 (11)

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

A active transport

B diffusion

C respiration

D transpiration

11 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

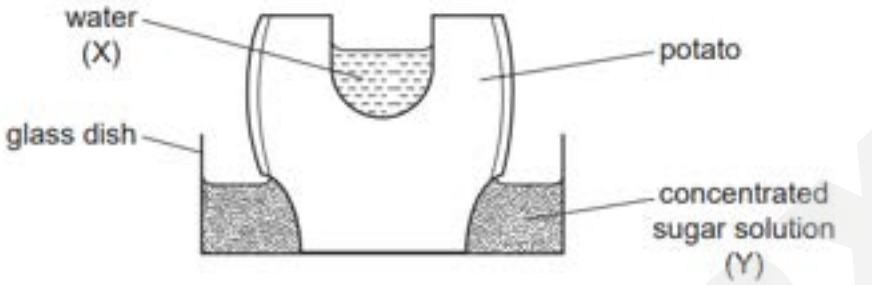
May/June 2015 (12)

10 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	✗	✗	✗

May/June 2015 (13)

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

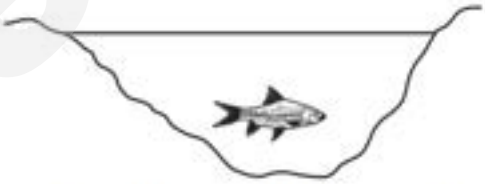


What happens to the volumes of water (X) and sugar solution (Y) after 12 hours?

	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

Oct/Nov 2015 (11)

10 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.

11 Which structure provides the best surface for diffusion?

A atrium

B bronchioles

C ileum

D trachea

Oct/Nov 2015 (12)

9 The diagram shows a plant cell.

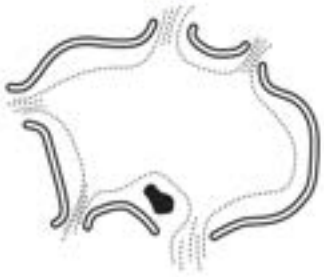
What is the appearance of this cell after it has been placed in pure water for 30 minutes?

A

B

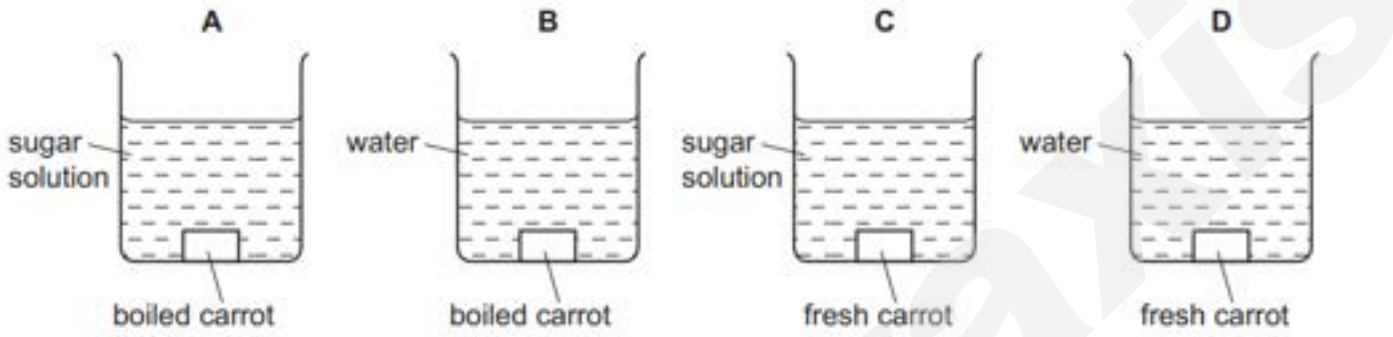
C

D



10 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?



Oct/Nov 2015 (13)

9 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?

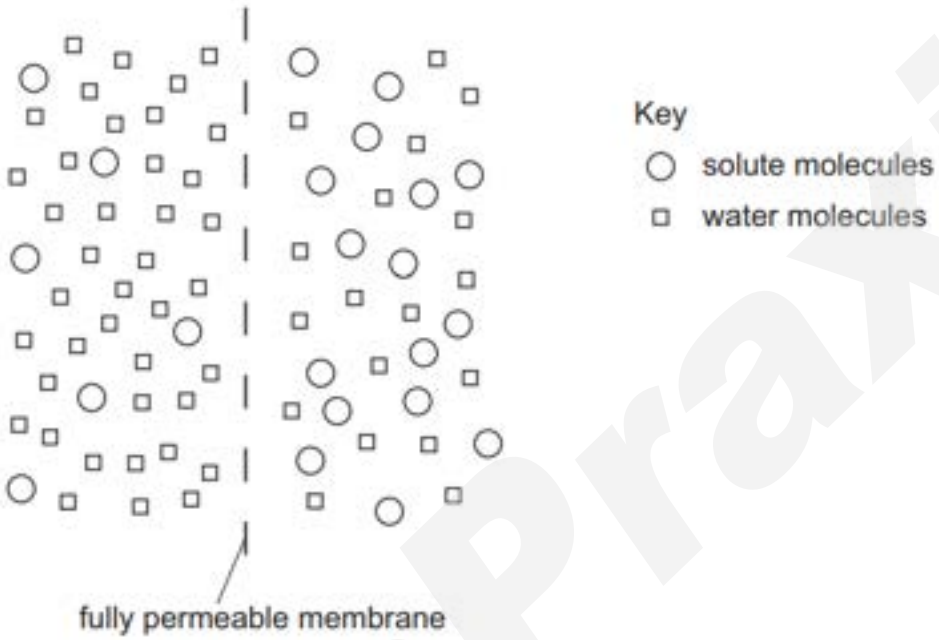
A Dissolved salts enter the cell by diffusion.

B Dissolved salts leave the cell by diffusion.

C Water enters the cell by osmosis.

D Water leaves the cell by osmosis.

10 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