



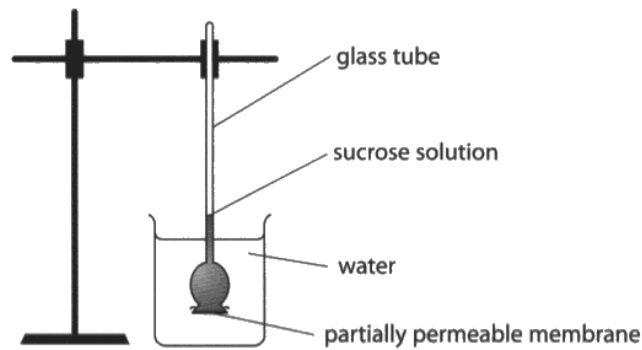
Pearson

Activity 5

AO2 samples 4a

Sample A scores 0

4 This apparatus can be used to show osmosis.



(a) Explain what happens to the level of the sucrose solution in the glass tube.

(3)

The sucrose solution will pass through the partially permeable membrane and disperse into the water of lower concentration through osmosis.

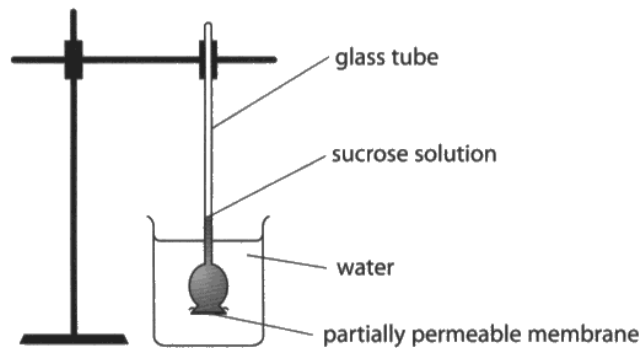


Pearson

Sample B scores 3

mp 2, mp3 and mp1.

4 This apparatus can be used to show osmosis.



(a) Explain what happens to the level of the sucrose solution in the glass tube.

(3)

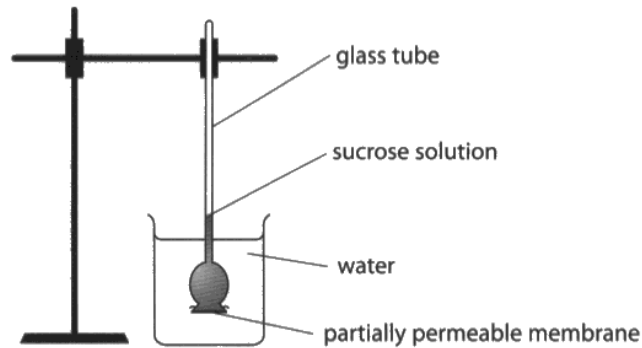
As the water has a higher water potential than the sucrose solution the water would move (through the partially permeable membrane) down the water potential gradient by osmosis into the ~~sucrose~~ sucrose solution. The level of the solution would actually increase as although the amount of sucrose is the same there would be more water and so a higher volume inside the glass tube.



Pearson

Sample C scores 0

4 This apparatus can be used to show osmosis.



(a) Explain what happens to the level of the sucrose solution in the glass tube.

(3)

The level of the sucrose solution in the glass tube will decrease because the sucrose solution has a higher water potential than the water. Osmosis is the movement of water molecules from an area of higher water potential to an area of lower water potential across a partially permeable membrane. The ~~sucrose~~ solutions will have the same water potential after the water and sucrose solution have mixed. The sucrose molecules will move across the partially permeable membrane into the water.

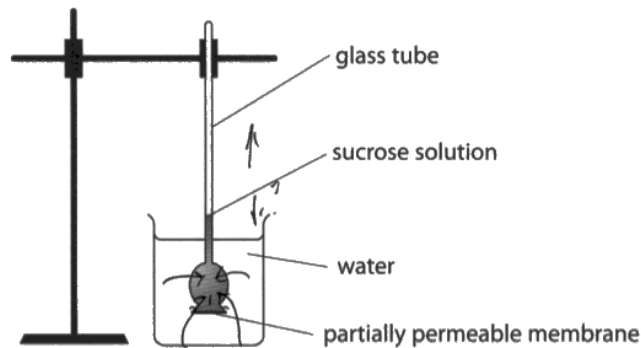


Pearson

Sample D scores 3

mp1, mp3 and mp2.

4 This apparatus can be used to show osmosis.



(a) Explain what happens to the level of the sucrose solution in the glass tube.

It will rise. This is because the sucrose solution⁽³⁾ has a lower water potential (w.p) than the surrounding water in the beaker. The water goes into the solution via osmosis and so increases the volume of the solution, making the level rise.



Pearson

Activity 6 Item 5b (iii)

Sample A scores 3

all 3 marks for correct answer.

- (iii) The student measures the distance moved by the coloured liquid and converts this to volume of oxygen absorbed.

The volume of oxygen absorbed can be calculated using the formula

$$\text{volume} = \pi \times \text{radius}^2 \times \text{distance}$$

Calculate the volume of oxygen absorbed when the coloured liquid moves a distance of 6.0 mm.

$\pi \times 0.6 \text{ cm}$
[diameter of tube = 1.0 mm]
 0.1 cm

(3)

$$\pi \times 0.05^2 \times 0.6 =$$

$$\pi \times 0.05^2 \times 0.6 =$$

$$\text{volume} = 4.71 \times 10^{-3} \text{ cm}^3$$



Pearson

Sample B scores 3

all 3 marks for correct answer.

- (iii) The student measures the distance moved by the coloured liquid and converts this to volume of oxygen absorbed.

The volume of oxygen absorbed can be calculated using the formula

$$\text{volume} = \pi \times \text{radius}^2 \times \text{distance}$$

Calculate the volume of oxygen absorbed when the coloured liquid moves a distance of 6.0 mm.

[diameter of tube = 1.0 mm]

$$\begin{aligned} & \pi \times 0.5^2 \times 6.0 \\ &= \frac{3}{2} \pi \\ &= 4.71 \quad (7.5.8) \\ &= 0.471 \quad (\text{cm}^3) \end{aligned}$$

(3)

$$\begin{aligned} & 0.00471 \\ & \text{volume} = \dots\dots\dots \text{cm}^3 \end{aligned}$$

$$\begin{aligned} & \pi \times 0.05^2 \times 0.6 \\ &= 4.71 \times 10^{-3} \\ &= 0.00471 \end{aligned}$$



Pearson

Sample C scores 3

all 3 marks for correct answer.

- (iii) The student measures the distance moved by the coloured liquid and converts this to volume of oxygen absorbed.

The volume of oxygen absorbed can be calculated using the formula

$$\text{volume} = \pi \times \text{radius}^2 \times \text{distance}$$

Calculate the volume of oxygen absorbed when the coloured liquid moves a distance of 6.0 mm.

[diameter of tube = 1.0 mm]

(3)

$$\pi \times 0.5 \text{ mm} \times 6 \text{ mm}$$

or

$$0.05 \text{ cm} \times 0.6 \text{ cm}$$

$$\pi \times 0.05^2 \times 0.6$$

$$\text{volume} = 4.71 \times 10^{-3} \text{ cm}^3 \quad (\text{3 s.f.})$$



Pearson

Sample D scores 2

2 marks for 4.71 see guidance on MS.

- (iii) The student measures the distance moved by the coloured liquid and converts this to volume of oxygen absorbed.

The volume of oxygen absorbed can be calculated using the formula

$$\text{volume} = \pi \times \text{radius}^2 \times \text{distance}$$

Calculate the volume of oxygen absorbed when the coloured liquid moves a distance of 6.0 mm.

[diameter of tube = 1.0 mm]

(3)

$$\pi \times 0.5^2 \times 6$$

=

(3 s.f.)

volume = 4.71 cm³