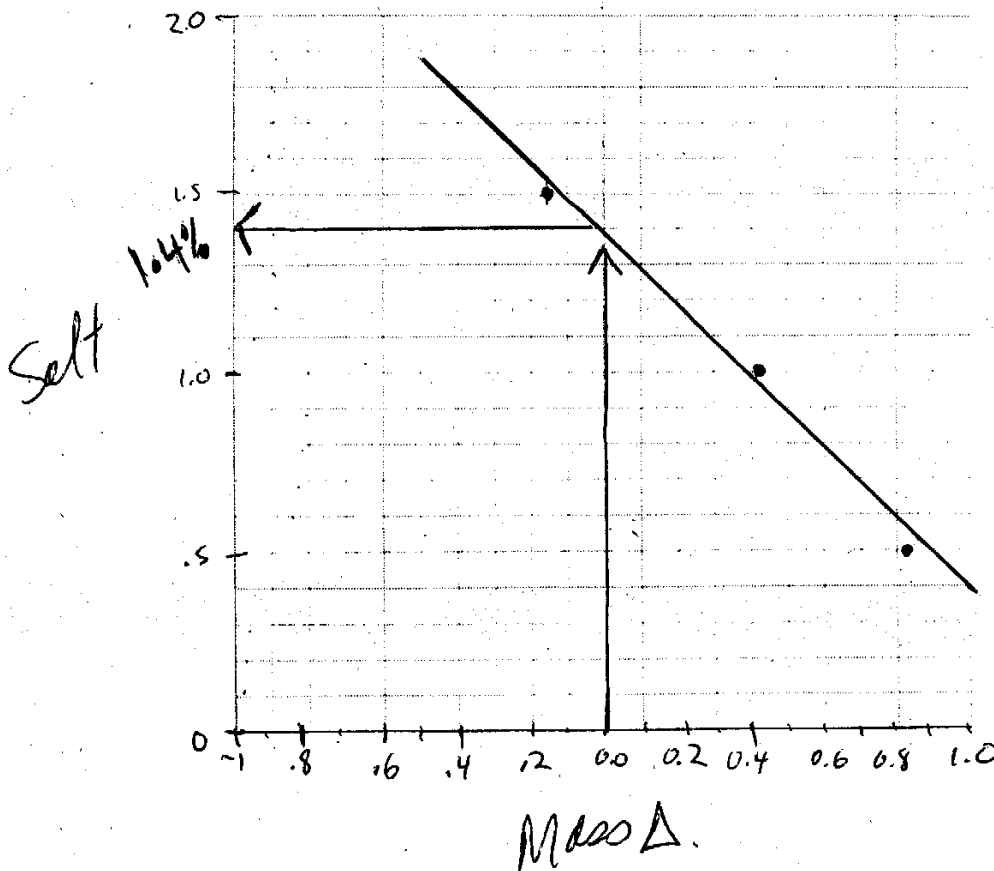


Key.

4. An experiment was designed to determine the correct salinity of water (percentage of salt in water) required to successfully clone certain cells using tissue culture. Three cell samples were placed in three different salt solutions and their change in mass was recorded in the data table shown below.

SALT IN WATER (%)	CHANGE IN MASS OF CELLS (%)
0.5	+0.82
1.0	+0.40
1.5	-0.15

- a) Use the grid provided to graph the data above. Label the *y*-axis as salt in water (%). (2 marks)



- b) If the cells must be cultured in a solution that does not cause them to shrink or swell, estimate the percentage of salt in water that would be best for culturing the cells. (1 mark)

1.4 %

- c) Why do the cells in the 1.5% salt solution lose mass? (1 mark)

Water MUST be leaving. This would be because the solution has more solutes than cell does therefore water osmoses out (hypertonic solution).

- d) Name the process and explain how each of the following nutrients, when added to any of the solutions, would enter the cells in the culture. (2 marks)

Glucose:

Name of Process:

Explanation: _____

Facilitated transport

→ Also glucose is large and can't fit through the membrane's pores.

Oxygen:

Name of Process:

Explanation: _____

Diffusion

→ Also oxygen molecule is extremely tiny and can easily fit through the membrane's pores and in between the phospholipid molecules themselves.

OVER

3. a) Explain why a cell membrane is described as *selectively permeable*. (1 mark)

Because it is permeable to some molecules and impermeable to others. It "selects" what passes through.

- b) Describe how the structure of the cell membrane permits molecules to enter the cell by the following processes. (3 marks: 1 mark each)

- i) Osmosis:

Membrane has microscopic protein lined pores which are large enough to allow water to pass through them, yet they are small enough to prevent larger molecules from passing.

- ii) Facilitated Transport:

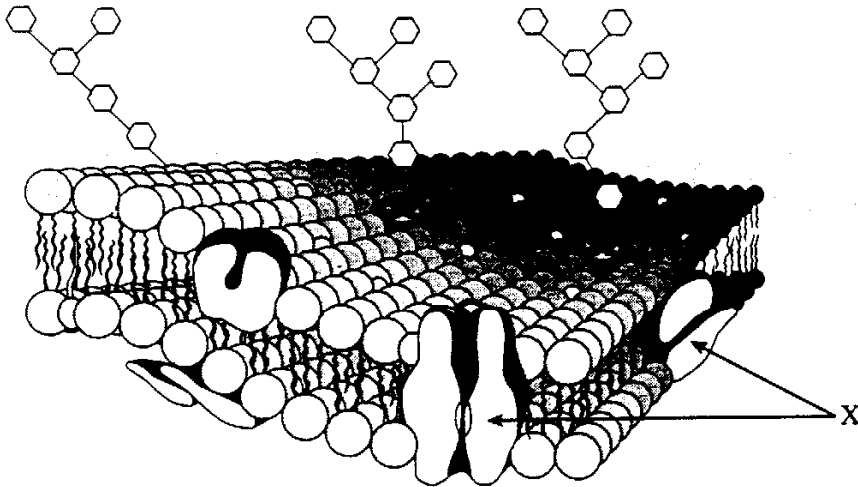
Membrane pores are too small to allow larger molecules to pass through them, so there are proteins embedded in the membrane which bind to molecules and bring them in.

- iii) Pinocytosis:

The membrane is fluid and flexible enough to fold in on itself. It can envelope bits of liquid.

over →

Use the following diagram to answer question 2.



2. a) Identify the molecules labelled X.

(1 mark)

X is a protein molecule

b) Name two processes by which these molecules function in order to move materials.

(2 marks)

i)

i. facilitated transport

ii. active transport

ii)

iii. osmosis/diffusion of small molecules in through the "holes" or pores made by the proteins.