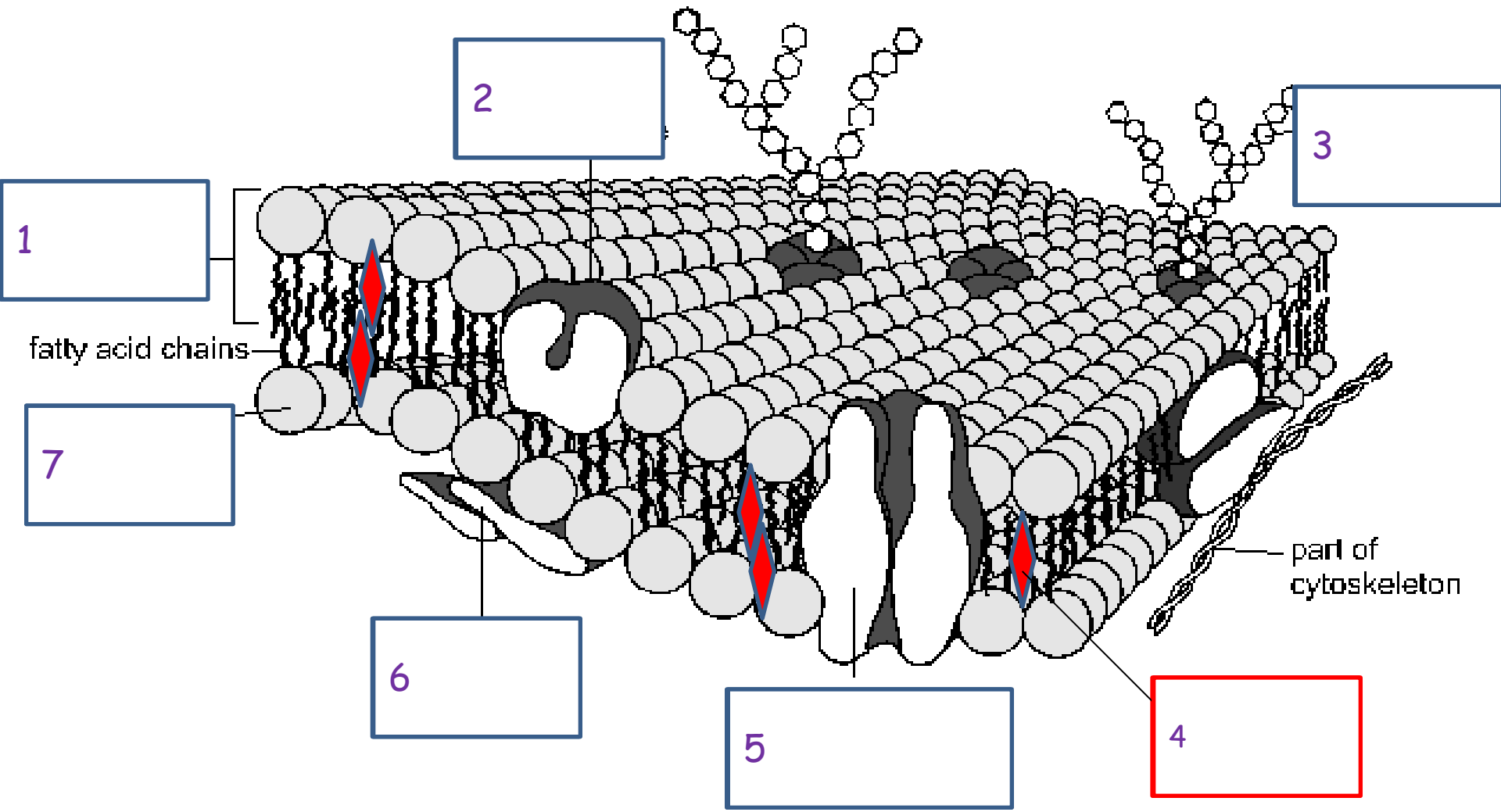
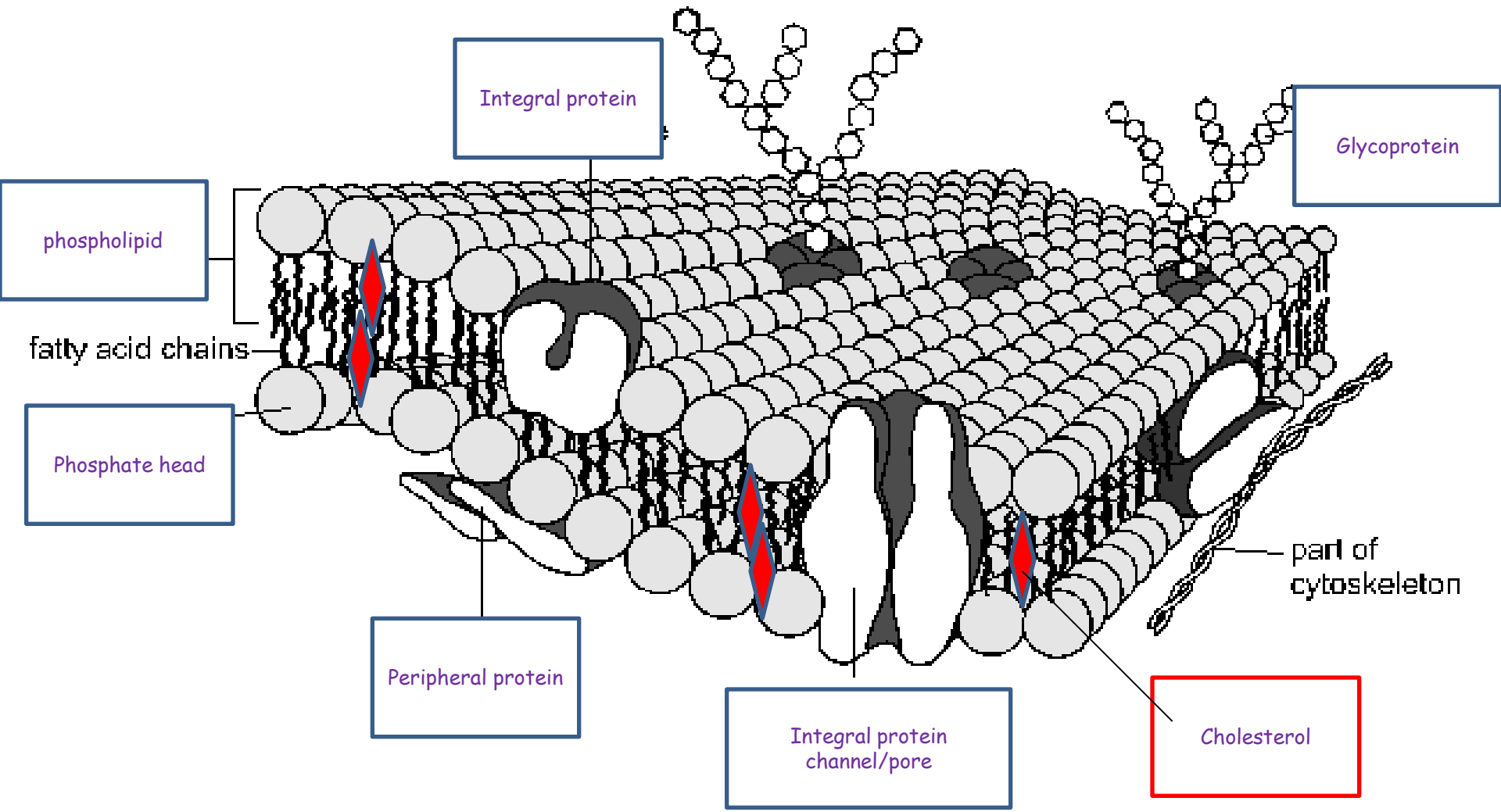
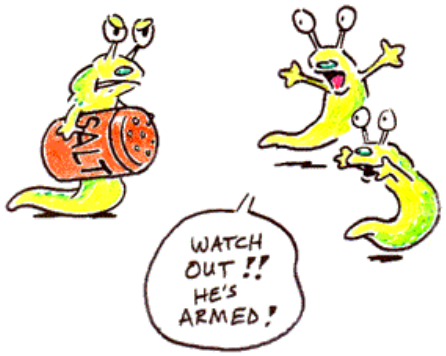
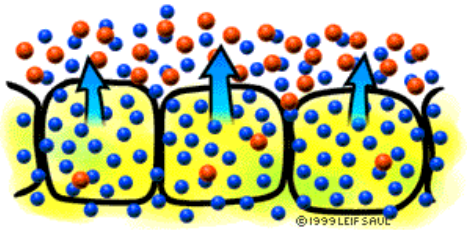

2
3
1
fatty acid chains
7
part of
cytoskeleton
6
5
4

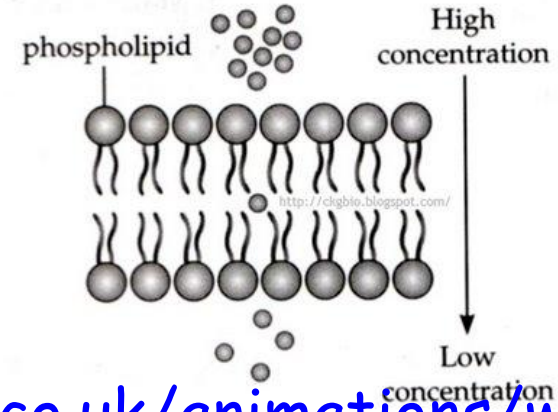

Integral protein
Glycoprotein
phospholipid
fatty acid chains
Phosphate head
part of cytoskeleton
Peripheral protein
Integral protein channel/pore
Cholesterol





Passive Transport Mechanisms

Aim: To understand how **water potential** affects cell tonicity



http://www.kscience.co.uk/animations/water_potential.swf

Finishing the Egg-Speriment

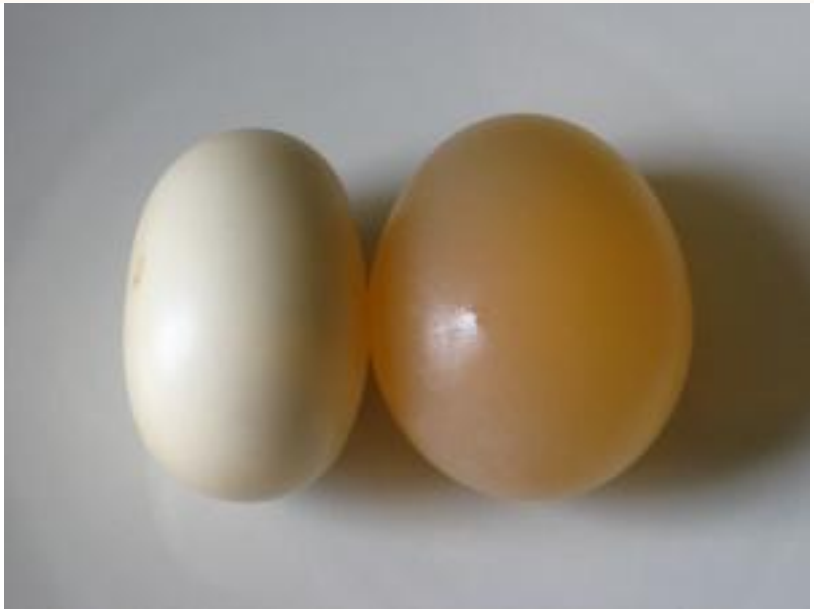
→ CAREFULLY wash eggs.

→Weigh eggs & record data (***quantitative***) on a sheet that can be handed to Ms for data input

→ Line up eggs with everyone else's. Can you see a differences?

→Take ***qualitative*** notes/observations

Egg photo shoot



Coursework

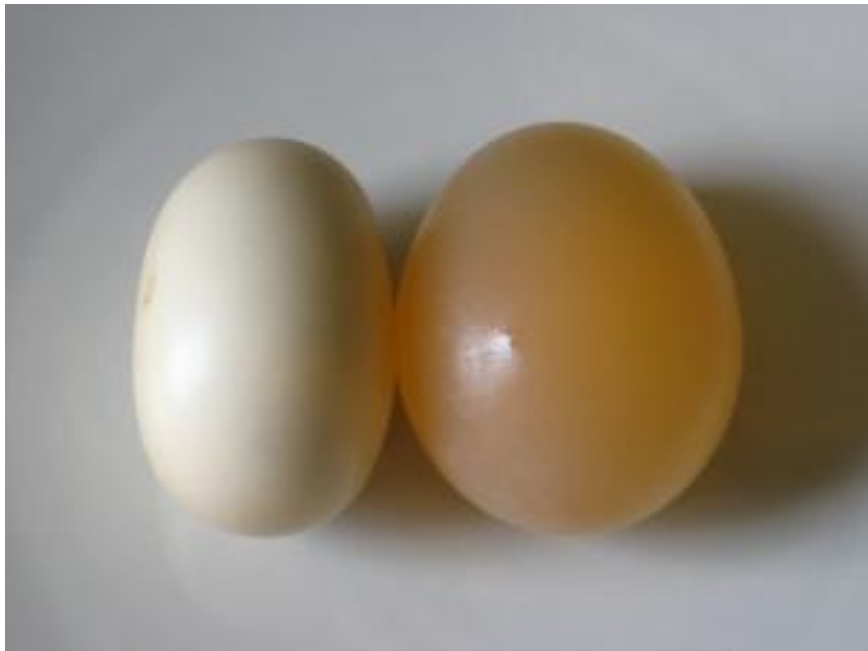
→ WJEC CW - Completed in exam style conditions

→ 3 sections of coursework to be completed ***by hand***

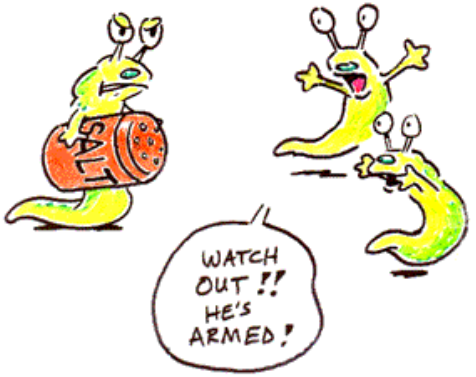
→ Table, Graph (no extrapolation!), qualitative data, analysis of results and further work (research!!!)

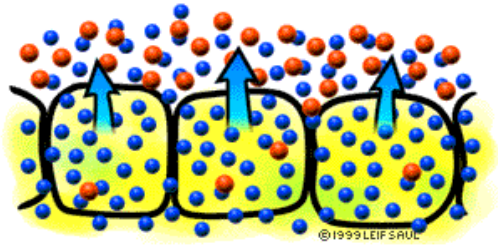
→ Due next lesson

→ 2 hours minimum



Osmosis





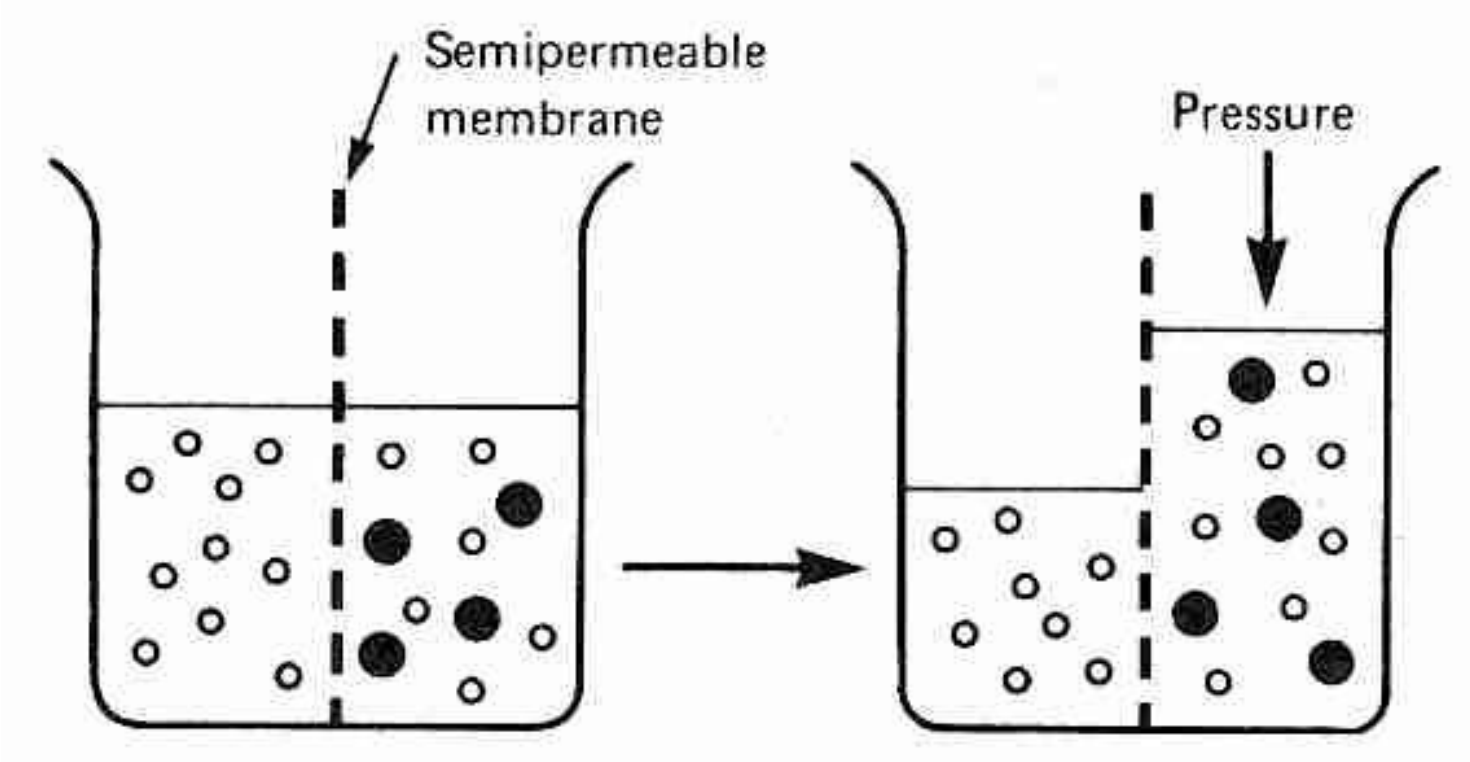
Learning Objectives

1. **Describe** passive processes of movement across cell membranes (C)

2. **Explain** water potential using osmosis and Ψs / Ψp

3. **Explain** the effects of hyper – hypo and iso-tonic solutions on The Naked Egg.

Explain what has happened to the water in terms of Ψs and *Ψp*



Right side has lower/more negative water potential (Ψs). As water moves to an area of lower water potential water move to the right until $\Psi_p + \Psi_s$ on the right is equal to that of the left.

Effect of solution concentration on Cells (RBCs)

- **Hypo**tonic Solution

Hypo = less solute than cell.

Water drawn INTO the cell

- **Iso**tonic Solution

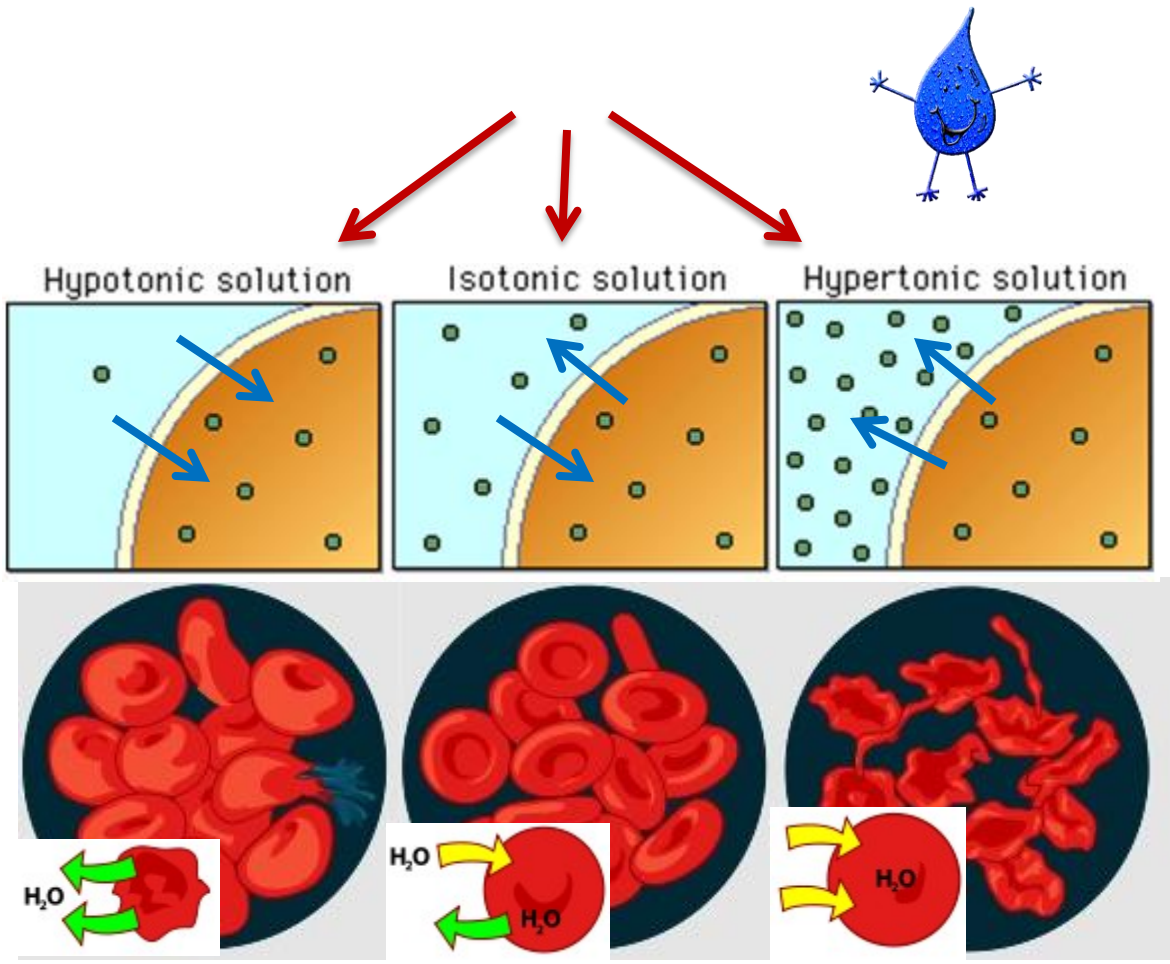
Iso = same amount of solute

No change – Dynamic Equilibrium

- **Hyper**tonic Solution

Hyper = more solute than cell.

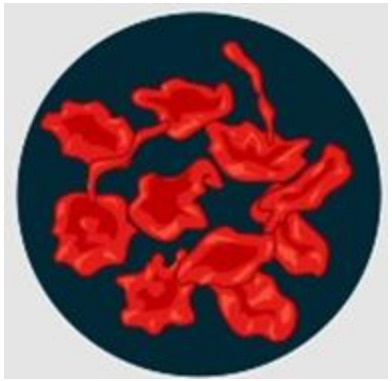
Water drawn OUT of the cell

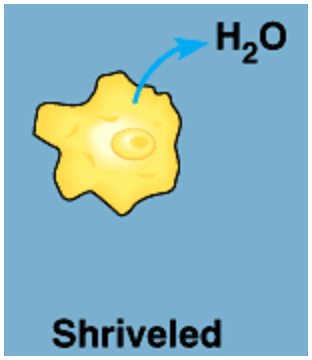


Decreasing water potential of solution cells are suspended in.

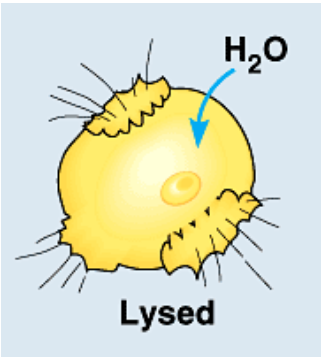
WP = 0 *WP = -*

Is the solution hypo, iso, or hyper-tonic to the cell?

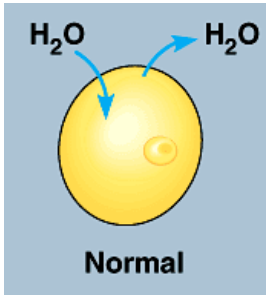




Hypertonic



Hypotonic



Isotonic

Water Potential?

Lower WP (psi)

Higher WP (psi)

Equal

http://www.kscience.co.uk/animations/water_potential.swf

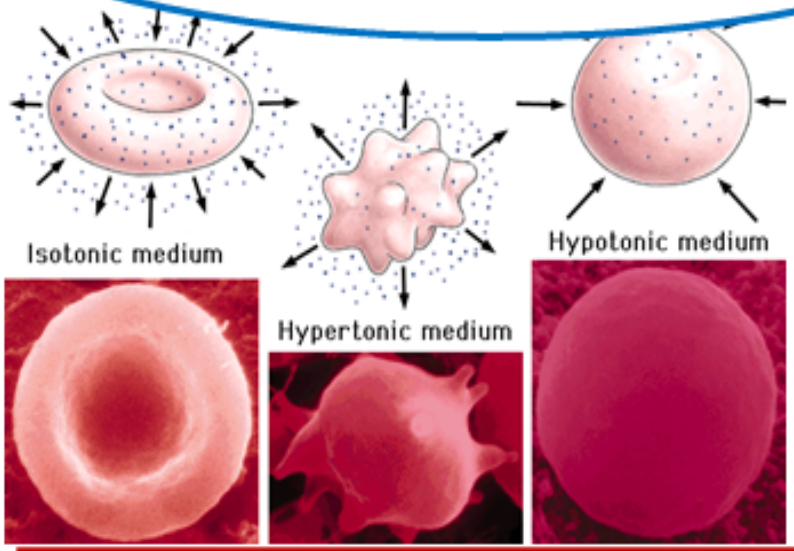
Name:
Set:

Osmosis & Water Potential

Define osmosis in terms of water potential:

Osmosis is the way water moves from an area of **high water potential or high Ψ** to an area of **low water potential or low Ψ**, through a **selectively-permeable** membrane.

What is Ψ?



Using water, explain why each red blood cell looks like it does:

Isotonic – Isotonic cell looks like this because it hasn't gained or lost water. Equal water pot

Hypertonic – Hypertonic cell necrotises as it's lost water due to solution of higher water pot.

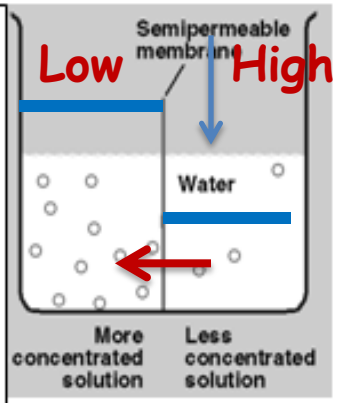
Hypotonic - Hypotonic cell is swelled as it has gained water in solution of lower water potential

What is Ψ is an animal cell? **Solute potential only: Ψs**

1. **Draw** what will happen to the water in this beaker.
2. **Draw** arrows to show the direction the water moves.
3. **Label** which sides have high/low water potential.

4. Add an arrow to show where Ψp will affect the solution.

5. Describe how the water moves:



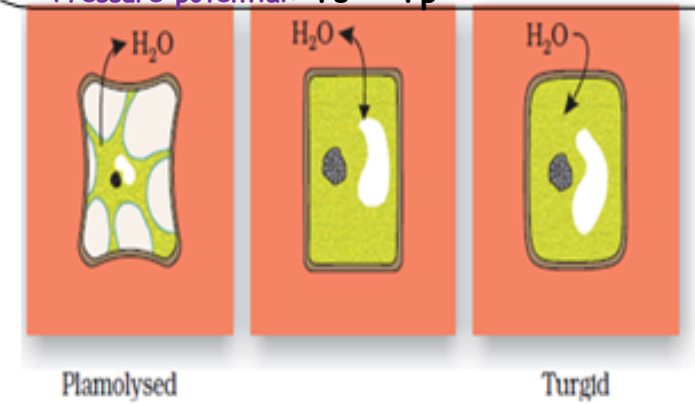
Q1: Where have you heard the word isotonic before?
Sports drinks?

Q2: Why do you think this is beneficial for sports drinks?
Fast uptake of glucose without dehydrating

Q3: What is the difference between putting an animal cell and a plant cell in to hypo and hypertonic solutions?

Hypotonic: Plant cell loses water, membrane pulls away from cell wall (plasmolysed). RBC necrotises
Hypertonic: Plant cell become turgid due to Ψp of cell wall, animal cell bursts – lyses.

Q4: What is Ψ equal to in a plant cell? Solute potential + Pressure potential: **Ψs + Ψp**

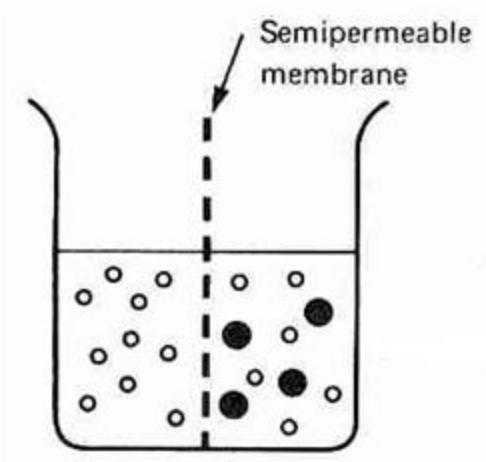


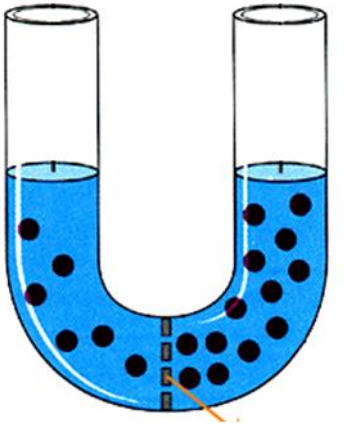
Water Potential

Water moves from an area of **high** wp to an area of **low** wp.

1.
What must we do to equalise this U bend?

2.
Which side has lower **Ψ**?





3.
Using **Ψ**, explain how the **water** will move?