1. Two molecules that can cross a lipid bilayer without help from membrane proteins are O₂ and CO₂. What property allows this to occur?
   
   Diffusion

2. In the supermarket, produce is often sprayed with water. Using correct terminology, explain why this makes vegetables look crisp.
   
   osmosis - H₂O diffuses from high to low concentration.

3. If a Paramecium caudatum swims from a hypotonic to an isotonic environment, will its contractile vacuole become more active or less? Why?
   
   Less active - slow down osmosis

4. Explain why strawberries will become wet after being sprinkled with sugar.
   
   H₂O diffuses from high concentration (inside cell) to low concentration (outside cell)

5. You are in the hospital and need intravenous fluids. You read the label on the IV bag, which lists all of the solutes in the water.
   
   - Why is it important for an IV solution to have salts in it? - because your bloodstream cells have salt in it.
   - What would happen if you were given pure water in an IV? - Cells would draw in H₂O & burst.

6. Using the properties of osmosis, explain how sugar or salt is used as a preservative.
   
   Sugar/Salt causes H₂O to leave bacteria cells & kill microorganisms that would cause decay.

7. If a cell is isotonic with a 0.88% NaCl solution, how would an extracellular fluid with 1% NaCl effect the cell?
   
   * NaCl would diffuse into the cell until equilibrium.
   * H₂O would diffuse out of cell.
8. Explain what would happen in the following conditions: The cubes represent sugar molecules. Each cube represents 20 sugar molecules. The cylinder is a beaker of water. The rectangle is a plant cell.

a. Use a squiggly arrow to show which way water would move in the condition below. Explain your answer.

```
inside cell  hypotonic
outside cell hypotonic
H2O goes hypo->hyper
```

b. Use an arrow to show which way the sugar would move if it could cross the cell wall and cell membrane. Use a squiggly arrow to show which way water would move. Explain your answer.

```
inside hypertonic
outside hypotonic
```
c. Use an arrow to show which way active transport would move the sugar molecules against the concentration gradient. What does it need to do this?

![Diagram showing active transport with an arrow pointing towards ATP]

d. In this setup the squares are food molecules that are too large to pass through the animal cell membrane. Which process is necessary to move the food molecules into the cell?

![Diagram showing endocytosis with the label "Endocytosis..."

More specifically, Phagocytosis - cell eating]

e. Draw a diagram where the cell has low concentration of salt molecules and the environment it is in has a high concentration of salt molecules in a water solution. Diagram which way the water molecules would move and explain why they moved that way.

![Diagram showing osmosis with the label "H2O moves out of cell to the hypertonic solution"

0.5% NaCl

20% NaCl]