

Purpose: To learn about diffusion and osmosis and how they affect cells

| Term | Definition |
|------------------|--|
| Diffusion | The movement of molecules (particles) from an area of _____ concentration to an area of _____ concentration. |
| Osmosis | The diffusion of _____. |

How do diffusion and osmosis work?

Molecules (we'll call them particles) are in constant _____. Because of this they constantly collide and move in different directions. If there are a high amount of particles in a certain space, we say it has a _____. These particles will collide with each other more and begin to spread to areas where there is a _____ of these particles.

Very important: concentration does not equal quantity! Never say something has "more" water or "less" when talking about osmosis/diffusion. Only say higher/lower concentrations. As we have a discussed, we can put a goldfish in the ocean and water will leave its cells. Why? Because the fish's cells have a higher concentration of water. If you said the cells had more water you'd be wrong: you really think the fish's cells have more water than the ocean? Mmmhmmmm.



Diffusion

Examples

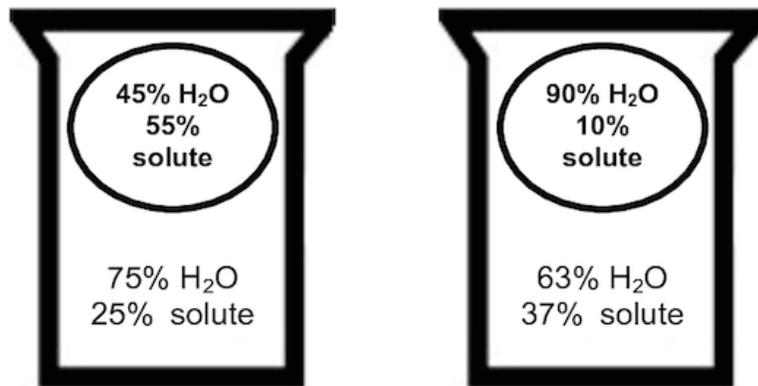
Imagine you are making a cup of tea. You fill a cup with boiling water and then place the teabag into the water. You notice that the tea begins to spread from the bag to the water. Why? The teabag had a _____ of tea than the water. Therefore, the tea moved from the _____ and to the _____.

Don't like tea? How about pop (or soda for you southerners). You open a 2L bottle of pop and forget to place the cap back on. After a day or two, you pour yourself another glass and it tastes horrible: it's flat! Why did this happen? Originally, the pop had a _____ of dissolved carbon dioxide gas. The surrounding air had a _____ of dissolved carbon dioxide gas. The carbon dioxide gas moves from the _____ and to the _____.

How about something more relevant to us: breathing! Take a deep breath. Your lungs are full of air. How will the oxygen in that air get into your blood vessels? The air in your lungs has a _____ of oxygen than the blood in the vessels around it. Therefore, the oxygen diffuses (moves) from the _____ and into the _____. How about all that carbon dioxide gas your cells have produced? How do you get rid of it? Your lungs contain a _____ of carbon dioxide gas than the blood in your blood vessels. Therefore, the carbon dioxide gas moves from the _____ and into the _____.

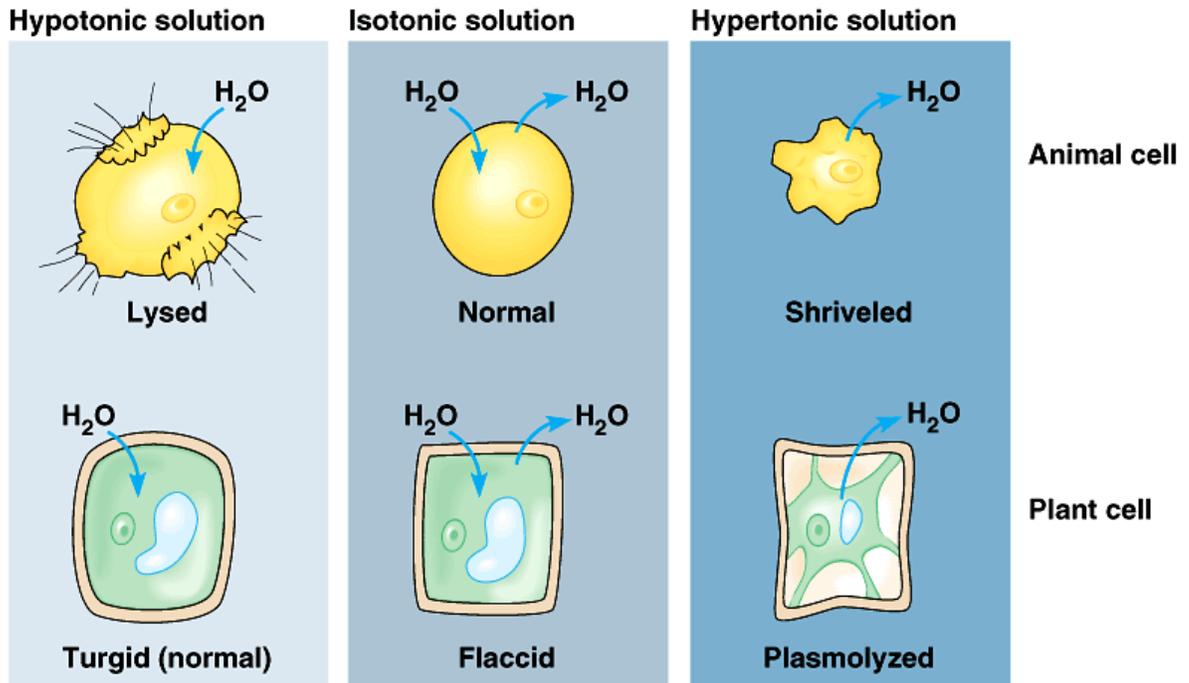
Practice

In each of the following diagrams, show where the water will move to/from by drawing an arrow. Will it move from the cell and to the solution or the other way? Note: the solute is the substance (e.g. salt, sugar, etc.) dissolved in water



Describing Solutions.

When we place a cell into a solution, we can describe the solution it is in by using the terms hypotonic, isotonic, and hypertonic.



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Diagram Information

| | Hypotonic | Isotonic | Hypertonic |
|--------------------------------------|--|------------------------------------|---|
| Lower Concentration is Found | _____ the cell | Nowhere. Concentrations are equal. | _____ the cell |
| Higher Concentration is Found | _____ the cell | Nowhere. Concentrations are equal. | _____ the cell |
| Where does the water move? | From _____ the cell to _____ the cell | It moves both in and out equally. | From _____ the cell to _____ the cell |
| What happens to the cell? | Cell becomes bigger because more particles are moving into it. | Nothing. The cell stays the same. | Cell becomes shriveled and shrinks because particles are leaving it |