**Bell Ringer – Diffusion and Osmosis**

**Date: Diligent Diffuser:**

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| 1. Will the ball roll up the gradient or down the gradient?
 | 1. This picture represents the diffusion of molecules. Place the following labels on the diagram: **high concentration**, **low concentration**, and an **arrow** showing the direction that the molecules would travel down their concentration gradient before equilibrium is reached.

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| 1. These red blood cells have all been placed in different solutions! Based on their appearance after being placed in these solutions for a period of time, fill in the blanks with **hypertonic**, **hypotonic**, or **isotonic**.

The left part of this illustration shows shriveled red blood cells bathed in a hypertonic solution. The middle part shows healthy red blood cells bathed in an isotonic solution, and the right part shows bloated red blood cells bathed in a hypotonic solution. |
| The solution is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ compared to the cell, which means it has a higher solute concentration and lower water concentration compared to cell. The solute cannot diffuse across the semi-permeable membrane which creates a water imbalance (concentration gradient). Water flows out of the cell to reach equilibrium, **causing the cells to shrink.** The cell is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ compared to the solution, which means it has a lower solute concentration and higher water concentration than the solution. | The solution is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ compared to the cell, which means it has the same solute concentration and same water concentration compared to cell. Water flows in and out of the cell equally, **causing the cell** **size to remain stable**.  | The solution is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ compared to the cell, which means it has a lower solute concentration and higher water concentration compared to cell. The solute cannot diffuse across the semi-permeable membrane which creates a water imbalance (concentration gradient). Water flows into the cell to reach equilibrium, **causing the cells to swell.** The cell is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ compared to the solution, which means it has a higher solute concentration and lower water concentration than the solution. |
| 1. Disaster scenario! What would happen if you had a saltwater aquarium at home, but you bought a freshwater fish and put it into the aquarium? Your answer should include words or diagrams showing where the **solute concentration** is **high and low**, and where the **water concentration** is **high and low**. Your answer also needs to have an **arrow** indicating the direction of water flow down its concentration gradient due to osmosis, and labels for **hypertonic** and **hypotonic** areas on the diagram.
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1. **The Gummy Bear Mystery**

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| Do you like gummy bears? We do! They are one of our favorite snacks, though we (try to) eat them in moderation because they are high in sugar. Consider that your sister is in a foul mood and decides to dump your gummy bears in your ice water about 30 minutes before you get home. The gummy bears are greatly enlarged by the time you get home! Your sister and some friends have different viewpoints for what happened. Draw a diagram below showing the enlarged gummy bears in a cup of water. Place the labels “**hypertonic**” and “**hypotonic**” in your diagram. One label should be for the gummy bears and one label should be for the water.  | **Viewpoints:** | Whose viewpoint is correct in the viewpoint column? A good answer has a good defense! **Defend your answer,** and also **give reasons why the other explanations are incorrect**. |
| A) Your sister said that the sugar left the gummy bears, because the gummy bears were **hypertonic** compared to the water. |
| B) Your friend Joe said that water traveled into the gummy bears, because the gummy bears were **hypertonic** compared to the water. |
| C) Your friend Suzy said the sugar went into the gummy bears, because the gummy bears were **hypotonic** compared to the water.  |
| D) Your friend Will said that water traveled into the gummy bears by osmosis, because the gummy bears were **hypotonic** compared to the water.  |

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| 1. Cogent Education | ProductsHelp! You are a veterinarian called in to save a baby calf named Clark who is suffering from severe seizures. The seizures are due to fluid movement into the brain which caused dangerous brain swelling. You can save Clark by giving him a treatment of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ saline solution.

You need to decide whether this blank should be the word **hypertonic, isotonic,** or **hypotonic**. Remember, you are trying to reduce the excessive fluid in the brain. Knowing that blood exchanges fluids with the brain may help.**Explain** your answer: Blood Brain Barrier | Blood Brain Barrier - Structure & Function | Blood  CSF barrier - YouTube |

Credit to Amoeba Sisters and ExploreLearning for this activity. 