

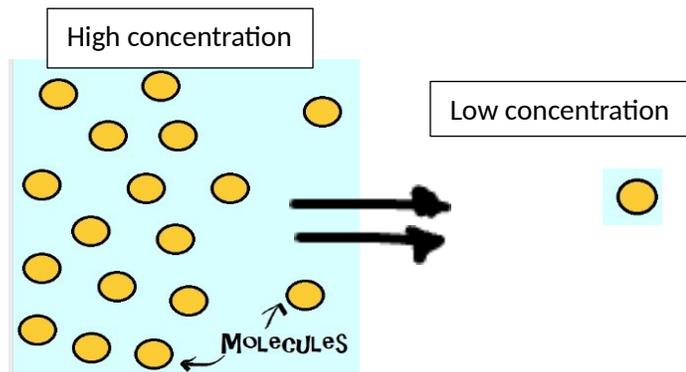
## Amoeba Sisters Video Recap of Osmosis



**Amoeba Sisters LLC**

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1. The below picture represents **diffusion** of molecules. Place the following labels in the diagram: **high concentration**, **low concentration**, and **an arrow** showing the direction that the molecules would travel before equilibrium is reached.



2. **Osmosis** is a type of diffusion, but it involves the movement of water. Similar to diffusion, osmosis is the movement of molecules (water molecules if osmosis) from a high concentration to a low concentration.

The video clip explains that you can also look at water as moving to a **higher** concentration of **solute** molecules.

Why can it also be viewed this way?

Because where there are more solute molecules, there are less water molecules, so water will move from an area with a lower solute concentration (with more free water) to a higher solute concentration (with less free water) to balance things out (equilibrium)

3. **Osmosis Scenario:** The video clip mentioned a disaster scenario of a saltwater fish being placed in fresh water.

What would occur if, instead, a freshwater fish was placed in saltwater?

Because the environment surrounding the fish is hypertonic, while the fish's cells are hypotonic, water would move out of the fish's cells → into the hypertonic environment in attempt to balance the concentration. In turn, the fish's cells would lose water and shrink, potentially killing the fish.

Your answer needs to have an **arrow** indicating the direction of water flow in osmosis, a label for "**hypertonic**," and a label for "**hypotonic**."

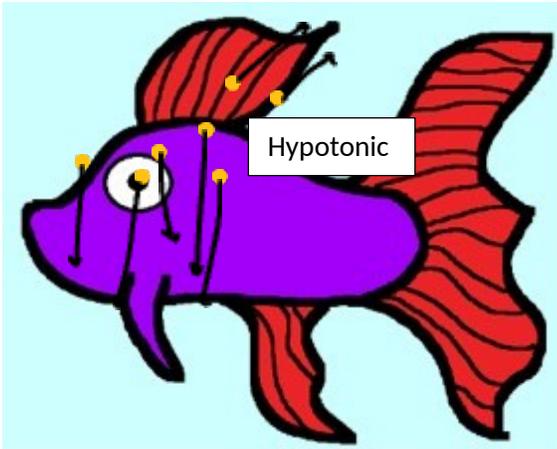
Hypertonic

4. **Osmosis Scenario:** Fluid movement into the brain after traumatic brain injury can result in dangerous brain swelling.

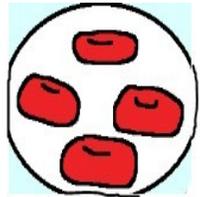
One treatment that can be used in some of these cases is adding a **Hypertonic** saline. You need to decide whether this blank should be the word hypertonic or hypotonic. Remember, you are trying to reduce the excessive fluid in the brain.

Explain your answer:

It would be a hypertonic saline solution because it would draw the excess fluid out of the brain's cells → into the blood vessels, reducing swelling and drawing the excess fluid out.

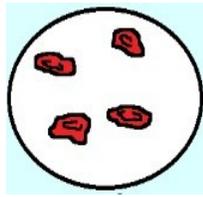


7. The cells are Hypertonic compared to the Hypotonic liquid solution.



SWELLING

8. The cells are Hypotonic compared to the Hypertonic liquid solution.



SHRINKING

9. The cells are Isotonic compared to the Isotonic liquid solution.



Stable

The Gummy Bear Mystery



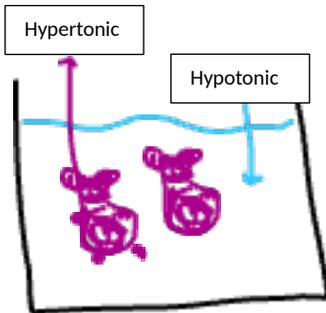
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Do you like gummy bears? We do! They are one of our favorite snacks, though we (try to) eat them in moderation because they are high in sugar. Consider that your sister is in a foul mood and decides to dump your gummy bears in your ice water about 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.

5.



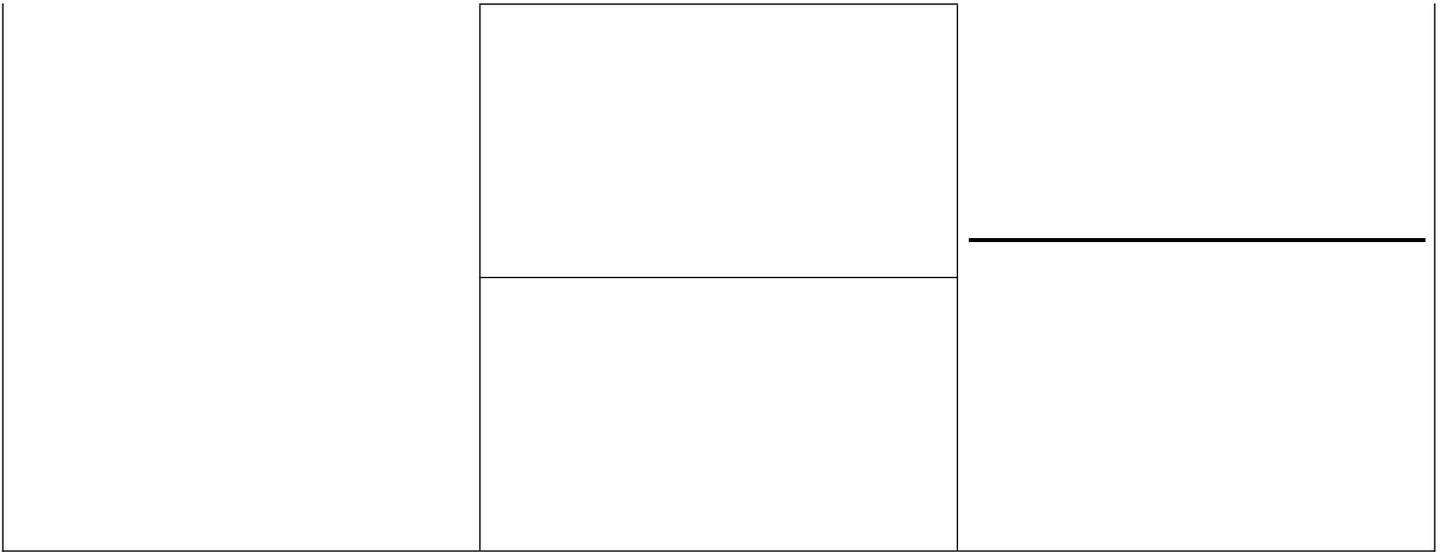
**Viewpoints:**

- 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.

6. 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**.

Answer B, Joe's viewpoint is correct because the water is hypotonic while the gummy bear is hypertonic (compared to the water), meaning that the water molecules moved into the hypertonic gummy bear (with less water molecules) to try to balance the concentration but resulted in the swollen gummy bears.

- Answer A is incorrect because osmosis is the movement of water, not sugar, so sugar wouldn't move out of the bears.
- Answer C is incorrect because again, osmosis is water movement and that wouldn't cause the bears to swell.
- Finally, answer D is incorrect because the bears are **HYPER**tonic compared to the hypotonic solution/water.



**Hypertonic, Hypotonic, or Isotonic? Oh My!**

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, place on each line (A) for **hypertonic**, (B) for **hypotonic**, or (C) for **isotonic**.