Name: _____ Unit 3 Topic 3
Period: _____

Observing Osmosis in Plant Cells

Introduction: Plant cells experience osmosis. Remember that osmosis is the movement of water molecules from a high concentration to a low concentration through a membrane. As the water leaves or enters the cell the cell membrane will shrink or stretch outward. The cell wall tries to stay in place. When a plant wilts you can see the effect of osmosis. Today you will be adding salt water to plant cells and documenting what happens.

How will the water move, into or out of the cell? Molecules, including water, all move from areas a high concentration to areas of low concentration. To answer the previous question, just think about where the concentration water is higher, inside or outside the cell? Three basic environments exist:

- **Hypotonic**: If the cell's external environment becomes very watery (dilute) then the outside of the cell will have a higher concentration of water than the inside. Which way will the water move in a hypotonic environment? _____

- **Hypertonic**: If the cell's external environment becomes very salty then the inside of the cell will have a higher water concentration. Which way will the water move in a hypertonic environment? _____

- **Isotonic**: If the cell's external environment has the same level of water concentration as the inside of the cell then there will be no net gain or loss of water to the cell. Which way will the water move in a isotonic environment? _____

Hypothesis: Write an IF/THEN/BECAUSE statement predicting what will happen when you add *salt water* to onion cells.

_____

_____

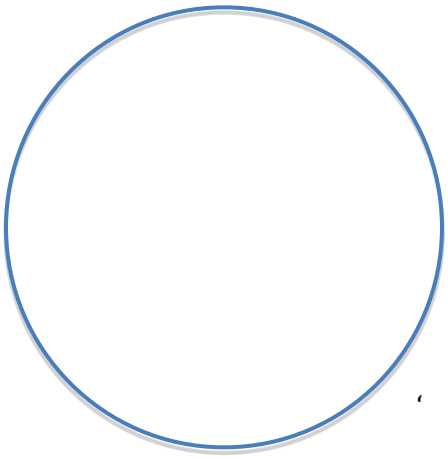
_____

Materials: Microscope, slide, cover slip, salt water and fresh water, 2 beakers, pipette, paper towel, onion.

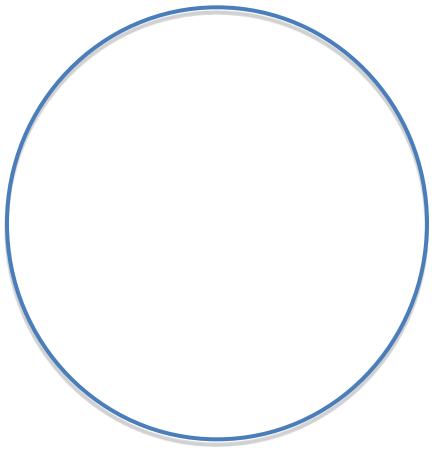
Procedure:

1. Make a wet mount slide of a thin layer of red onion.
    a. Put the onion specimen on the slide
    b. Put 2 drops of fresh water on the onion specimen
    c. Slide the edge of the coverslip along the slide until it makes contact with the water. Then slowly lower the rest of the coverslip onto the slide.
2. Carefully focus on the Low then Medium then High power objective lens.
3. **Sketch and label 3 organelles on medium or high power (whichever gives a clearer image).**
4. Have your partner add several drops of salt water (blue) with a pipette to one edge of the coverslip as you watch through your eyepiece on high power. They should go to the other side of the coverslip and use a paper towel to draw the salt water through. Observe for 2 minutes.
5. Sketch what it looks like on High power after the two minutes.
6. Have your partner add several drops of fresh water with the pipette to one side of the coverslip. They should immediately go to the other side of the coverslip and use a paper towel to draw the freshwater through. Again, observe for 2 minutes.
7. Sketch what it looks like again on High power.
8. Switch with your partner and be the lab technician for them as they observe and sketch.

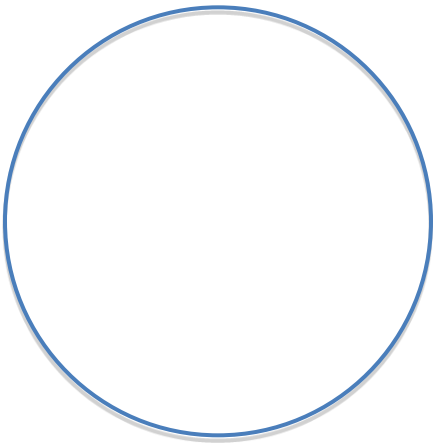
Observations: Be accurate with your drawings and don't forget to **label and color them**!



Original Onion
Magnification: _____



Onion plus Salt Water
Magnification: _____



Onion plus Fresh Water
Magnification: _____

Analysis: Use **complete sentences** to answer all questions.

1. What kind of particle movement is this an example of?

2. Which direction did the water move when you put the salt water on the onion (into or out of the cell)? Explain why the water moved in that direction.

3. Why did the cell membrane expand back out when the fresh water was added after the salt water?

4. Using your knowledge of osmosis, why do grocery stores spray water on their vegetables?

5. When stranded at sea, many people try to drink the sea water to stay hydrated. Explain why this is not a viable option and what it is dangerous for humans.

6. In icy conditions salt is often applied to roads to melt the ice. After the snow melts you may notice that the grass along the side of the road is dead. Explain what has happened to the grass using the following vocabulary. Hypotonic, hypertonic, isotonic, high concentration, low concentration, osmosis.