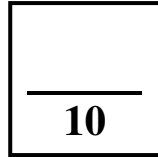
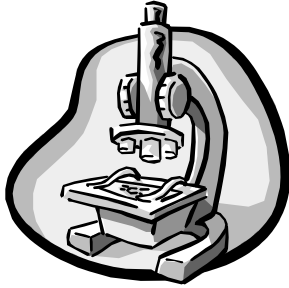


Science 10-Biology  
Activity 6  
Experiment on Osmosis



Name _____	
Due Date _____	
Show Me <input type="checkbox"/>	Hand In <input type="checkbox"/>
<i>Correct and Hand In Again By</i> _____	

**Purpose:**

To observe cells in osmotic balance and osmotic imbalance.

**Introduction:**

The movement of water across a membrane from an area of high water concentration to an area of low water concentration is called **osmosis**.

If the concentration of water outside the cell is *the same as* the concentration inside, the cell is said to be in **osmotic balance** and there is no net flow of water into or out of the cell.

If the concentration of water outside the cell *is different than* that inside, the cell is in a state of **osmotic imbalance**, and a net flow of water will occur across the cell membrane.

This could result in damage or death to the cell.

**Equipment and Materials:**

A microscope, slides and cover slips

A thin piece of red onion

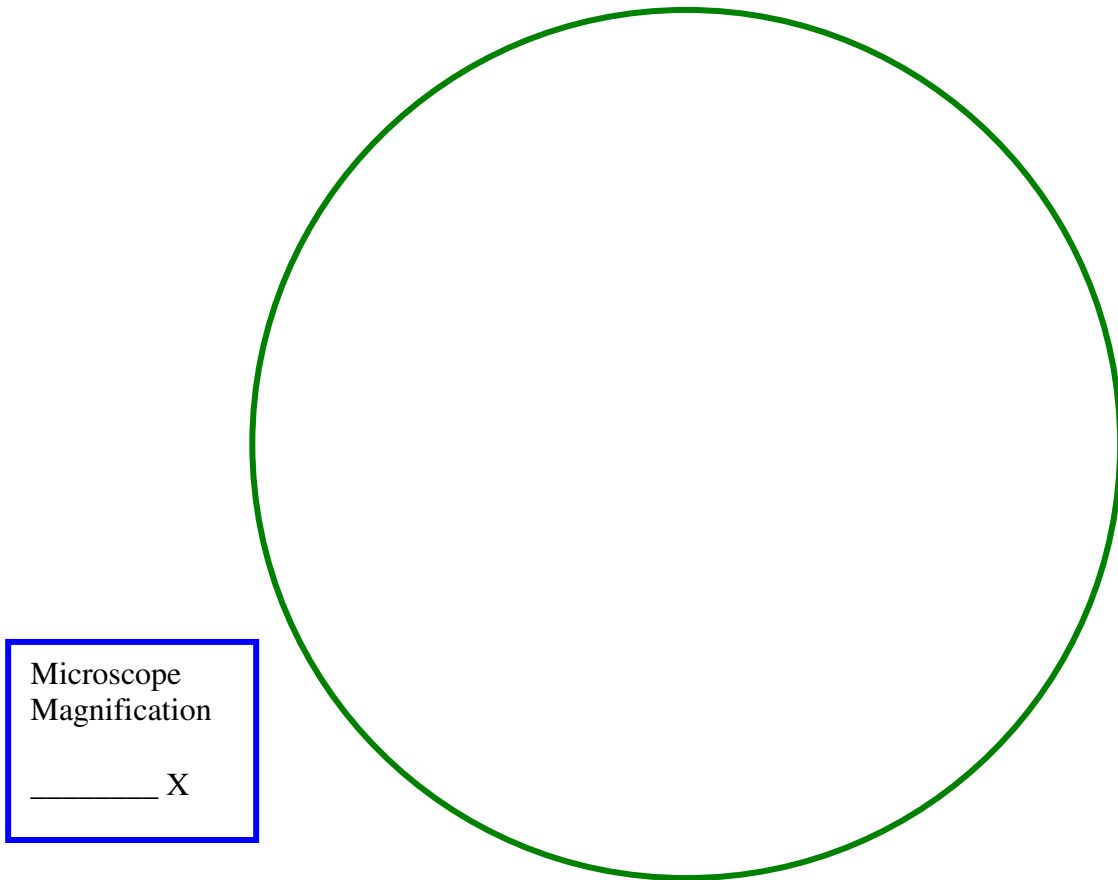
A 6% solution of salt

A scalpel

**Part 1—Viewing Cells in Osmotic Balance****Procedure:**

1. Cut a very thin piece of red onion membrane. The teacher may help you with this.
2. Prepare a wet mount of the piece of red onion. View it under the microscope, focusing in low power first, then medium, then high power.  
Notice the cell walls, the cell membrane and the red pigment inside the cells.
3. On the top of the next page, sketch what you see of the onion cells. They are now in **osmotic balance**.

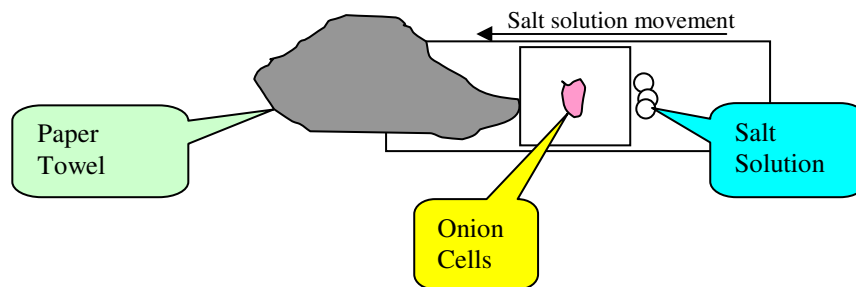
**View # 1—Onion Cells in Osmotic Balance**



**Part 2—Viewing Cells in Osmotic Imbalance**

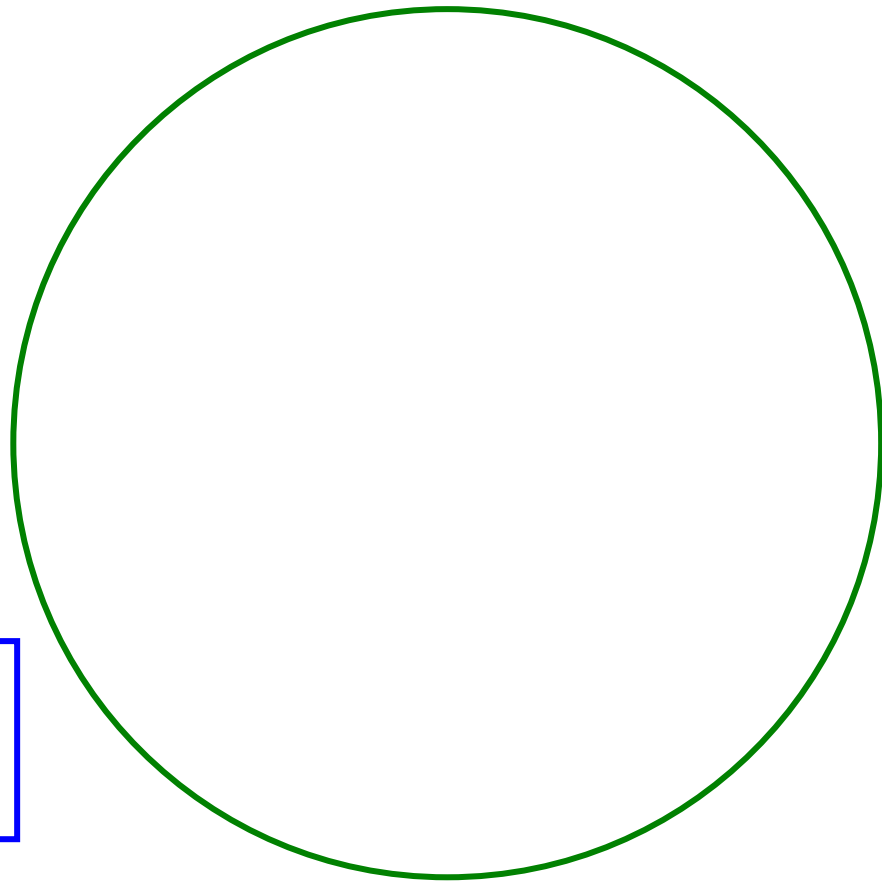
**Procedure:**

1. To one side of the slide, using a dropper, add a few drops of 6% salt solution. Be careful not to spill any of this on the microscope.
2. Draw the salt solution under the slide by holding a piece of paper towel on the other side of the slide:



Observe what is happening to the cells while the salt solution is drawn around them. Wait until you see no more change and make a sketch of what you see on the next page.

**View # 2—Onion Cells in Osmotic Imbalance**



Microscope  
Magnification  
  
\_\_\_\_\_ X

If some students don't get a clear view of what's going on, the teacher may take one of the "good" slides and place it in the microscope with the camera and T.V. screen, so that everyone can see it.

What has happened to the "pink" part of the cells? \_\_\_\_\_

Which way do you think water has diffused, out of the cells or into the cells? \_\_\_\_\_  
\_\_\_\_\_.

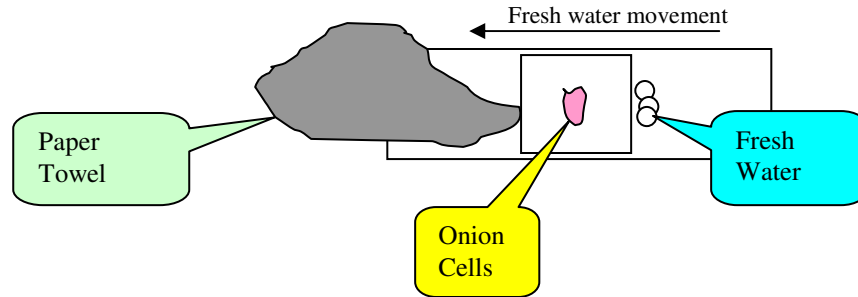
What has happened to the cell membranes? (*shrunk or expanded?*) \_\_\_\_\_

Did the cell walls shrink, expand or remain the same as they were? \_\_\_\_\_

### Part 3—Adding Water Around Cells in Osmotic Imbalance

#### Procedure:

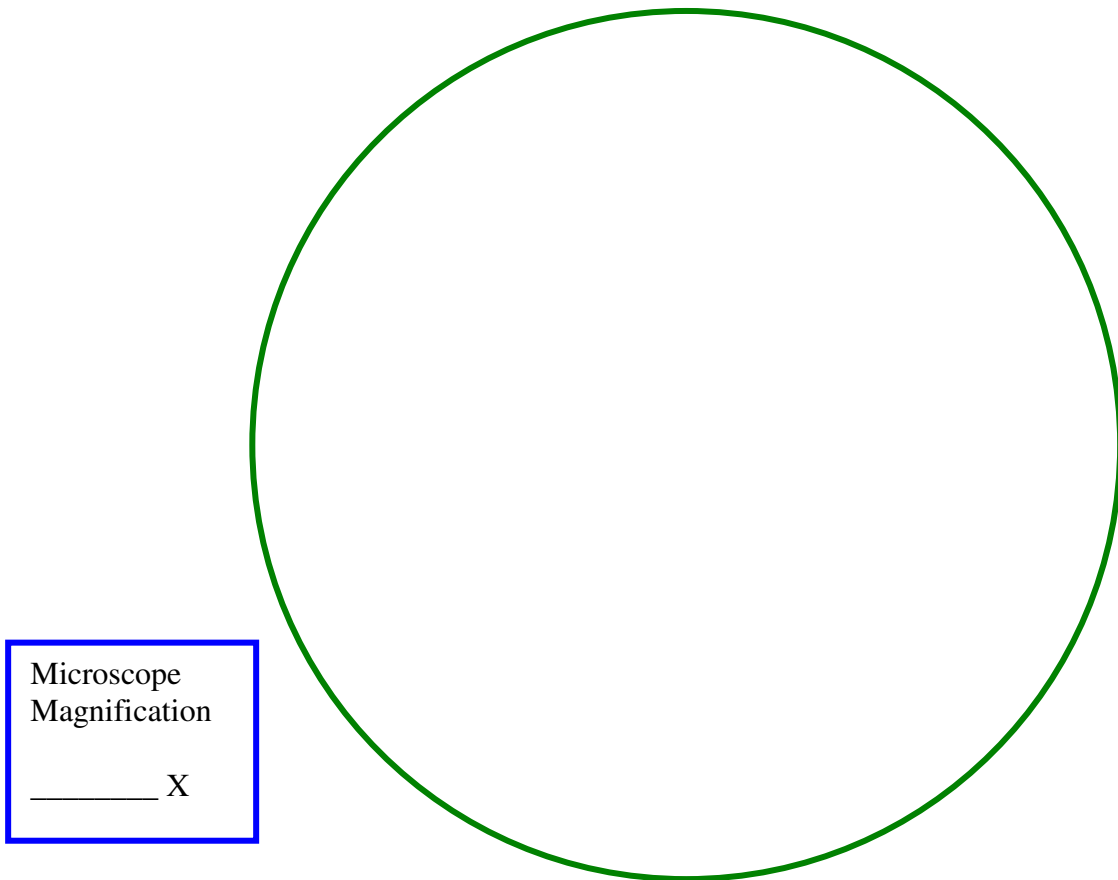
1. Now, rinse out your dropper, fill it with fresh water and put several drops of water where you put the salt solution in Part 2. Draw the water through the sample using a new piece of paper towel on the other side:



Observe what is happening to the cells as the fresh water replaces the salt water around them.

Wait until you see no more change and sketch what you see:

#### View # 3—Water Added Around Onion Cells in Osmotic Imbalance



Microscope  
Magnification  
\_\_\_\_\_ X

What has happened to the “pink” part of the cells after fresh water was added around them?

\_\_\_\_\_

Which way do you think water has diffused this time, out of the cells or into the cells? \_\_\_\_\_

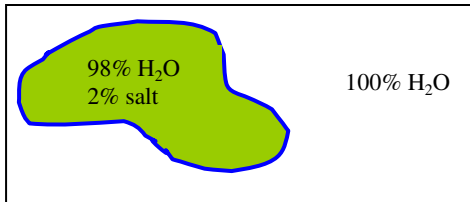
\_\_\_\_\_.

What has happened to the cell membranes? (*shrunk or expanded?*) \_\_\_\_\_

Did the cell walls shrink, expand or remain the same as they were? \_\_\_\_\_

**Questions:**

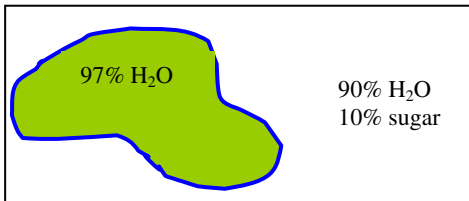
1. Inside a cell membrane there is 98% water and 2% salt, while outside the cell membrane there is pure water. Which direction will the water flow, into the cell or out of the cell?



\_\_\_\_\_

Explain your answer.

2. A cell, which has 97% water inside the cell membrane is placed in a sugar solution which is 10% sugar and 90% water. Which way will water flow, into the cell or out



of the cell? \_\_\_\_\_

What will happen to the **size** of the cell as this happens?

\_\_\_\_\_

3. What is meant by **diffusion**?

4. What is meant by **osmosis**?

5. Why don't sugar molecules move easily across a cell membrane? \_\_\_\_\_