Osmosis Inquiry Labs

Name:_____

Purpose:
The purpose of this activity is for you to create a lab to observe the qualitative effects of osmosis in red onion cells. You will also complete a lab to quantitatively measure the rate of osmosis in potato cells.

Hypothesis:
Write a hypothesis for your **qualitative** lab.

Write a hypothesis on how the mass of the potato slices will change when placed in the 4 beakers described in the procedures for the **quantitative** lab.

Teach Signature: _____

Materials :
Qualitative Lab (List all materials here)

Quantitative Lab: 2 small white potatoes, 4 250 ml beakers, balance, paper towel, pencil, masking tape, 75 ml distilled water, 75 ml each of a 5%, 10%, and 15% sodium chloride solutions, single-edge razor blade

Procedures:
Qualitative Experiment
List all procedures here. You may add extra steps if needed.
1.
2.
3.
4.
5.
6.
7.
8.

***Write before observations in data section.
***Draw before observations in data section.

Quantitative Experiment

1. Cut a white potato into 8-12 slices. Each piece should be about 1 cm thick.
2. Determine the mass of the potato slices in stacks of three.
3. Record the mass of each stack of three slices in the data table.
4. Put a stack of potatoes into 4 different beakers.
5. Label the beakers, using a pencil and masking tape, A, B, C, and D.
6. To beaker A, add 75 ml of distilled water; to beaker B, add 75 ml of 5% sodium chloride solution; to beaker C, add 75 ml of 10% sodium chloride solution, and to beaker D, add 75 ml of 15% sodium chloride solution.
7. After 20 minutes, remove the potato slices from the beakers.
8. Quickly blot the slides with a paper towel.
9. Mass each stack.
10. In the data table, record the mass of each stack after soaking.
11. In rows 3 and 4 of the table, indicate the amount of increase or decrease in mass of each stack.
12. Calculate the percent change by using the following formula:

$$\frac{\text{Amount of increase or decrease}}{\text{Mass before}} \times 100 = \%\ \text{change}$$

Data and Observations:
Qualtitative Lab

"Before" Observations:

"Before" Drawings:

"After" Observations:

"After" Drawings:

Quantitative Lab
Data Table

	Beaker A	Beaker B	Beaker C	Beaker D
Mass Before				
Mass After				
Amount of Increase				
Amount of Decrease				
Percent Change				

** See above for percent change formula

Analysis: (please put on separate sheet and attach)
1. What do you observe about your potato stacks?

2. What happens to the cytoplasm of plant cells when the cells are put in a 15% solution? Why? What happens to the cell wall? Why?

3. Will the same thing happen to animal cells when placed in a 15% solution? Why or why not?

4. What does this movement of water have to do with homeostasis in a cell?

5. What would happen to a plant cell when placed in a solution that matched it's internal salt content? Why?

6. What organelles in a cell help maintain homeostasis of water content?

7. Did the results of your qualitative experiment support your hypothesis? Why or why not was this the case?

7. Which potato stack gained the most mass after 20 minutes of immersion? Which potato stack lost the most mass?

8. What might have been the results with the potato slices if the immersion time were lengthened? Would this trend continue indefinitely? Why or why not?

9. Why was the first part of this activity considered qualitative and the second part quantitative?

Conclusions: Please explain 3 important concepts you learned in complete sentences.