

**Title:** Osmosis in Potatoes and Carrots

**Purpose:** to demonstrate osmosis in plant cells

**Materials:**

potato cubes	potassium permanganate (KMnO <sub>4</sub> )	forceps
carrot slices	plastic beakers	pipettes
distilled water	small petri dishes	marking pen
salt water solutions	balance	safety goggles

**Procedure:**

*Potato cubes in KMnO<sub>4</sub>*

1. obtain carrot slice, small petri dish, and pipette of KMnO<sub>4</sub>
2. measure dimensions of potato cube and record in data table
3. empty pipette of KMnO<sub>4</sub> in petri dish
4. place potato cube in center of dish in the KMnO<sub>4</sub> solution
5. record changes and height of KMnO<sub>4</sub> at 5 minute intervals

*Carrot slices in salt solution*

1. obtain 5 small beakers and label each as distilled H<sub>2</sub>O, 1.0%, 2.5%, 5.0%, 10.0% salt.
2. place 25 mL of the appropriate solution in each beaker
3. obtain 2 carrot slices for each beaker.
4. determine mass of 2 carrot slices BEFORE placing in distilled H<sub>2</sub>O.
5. determine mass of 2 carrot slices BEFORE placing in 1.0% salt
6. repeat for each solution
7. after 30 minutes, remove carrot slices from solution, pat dry, and determine mass
8. record data and determine percent change in mass
9. graph percent solution (x-axis) vs percent change (y-axis)

$$\% \text{ change} = \frac{\text{final mass} - \text{initial mass}}{\text{initial mass}} \times 100$$

Results:

**KMnO<sub>4</sub> Diffusion in Potato Cubes**

Time (minutes)	Description	Drawing
0		
5		
10		
20		
25		
30		

**Carrots in Salt Water**

Solution (% NaCl)	Initial Mass	Final Mass	% Change
0.0 %			
1.0%			
2.5%			
5.0%			
10.0%			

see **LAB GRADING GUIDELINES FOR DISCUSSION, CONCLUSION, REFLECTON**

<http://www.jdenuno.com/PDFfiles/LabGuide1.PDF>

