POPPY SCHOLARS · BIOLOGY: THE LIVING EARTH

Home lab 5 · Unit 5 · about 30 minutes of work plus 60 minutes of waiting

Which way does water move across a cell membrane when a cell sits in a salty solution?

Name _____ Date _____

MATERIALS

You supply everything. Tick each item as you gather it.

- ☐ 1 raw potato and a knife (an adult may cut for you)
- ☐ 4 cups
- ☐ Table salt, a kitchen scale (grams), and a measuring cup
- ☐ A ruler in millimeters
- ☐ Water, a spoon and a timer

SAFETY

Use a cutting board and cut away from your hand. Adult help is fine for the cutting. Do not taste the solutions. Wash your hands after handling raw potato and discard everything at the end.

PROCEDURE

1. Make four solutions in 100 mL of water: no salt (0 g), 3 g salt, 6 g salt, and 9 g salt. Stir each until the salt dissolves. Label the cups.
2. Cut 12 strips of potato, each 5.0 cm long and about the same thickness, from the same potato. Measure each length to the nearest millimeter.
3. Put 3 strips in each cup so that they are fully under the liquid. Start the timer.
4. After 60 minutes, take the strips out one cup at a time, pat dry, and measure each length again. Also bend a strip from each cup and write down whether it is stiff or limp.
5. Compute the mean final length for each cup and the percent change in length: (final minus start) divided by start, times 100.
6. Plot percent change (vertical) against salt concentration (horizontal) and draw the best straight line. Read off the salt concentration where the line crosses zero.

RECORD YOUR DATA

Salt (g per 100 mL)	Strip 1 final (cm)	Strip 2 final (cm)	Strip 3 final (cm)	Mean (cm)	% change	Stiff or limp?
0						
3						
6						
9						

LAB REPORT

Write a report that gives your table and your graph's reading, shows one percent-change calculation, and explains your result in terms of the direction water moves across the membrane of each potato cell. Say what the

zero crossing tells you about the inside of the potato cells.

Report the numbers you actually got, even when they disagree with the lesson. Write on the lines, or type your report on the website and send it to a teacher there.

Question and hypothesis *State the question in your own words, what you expect to happen, and why you expect it.*

Method *What you changed, what you measured, what you kept the same, and how many trials you ran.*

Observations *Describe what you saw, including anything unexpected. Your data tables are added to the report automatically.*

Calculations *Show each calculation step by step, with units.*

Claim and reasoning *Answer the question using your numbers, then explain why, using the biology from the unit.*

Limits and next step *What could have affected your results, and one change you would make next time.*