Microscopy & Cell Transport: Osmosis

SBI3C | Student laboratory assignment | 1 of 4

Prepare for your investigation

Name: _____ Date: _____ Class: _____

Research question

How do microscope magnification and external solute concentration influence observations of cells and water movement?

Learning goal: use the virtual model to gather evidence, explain microscopy & cell transport: osmosis and communicate a supported conclusion.

Materials: WorksheetGalaxy virtual laboratory, this assignment, calculator or spreadsheet if needed. Virtual observations only; do not recreate hazardous procedures or perform physical fitness tests without teacher approval.

1. Define two relevant scientific terms from the Background Information tab. (K/U)

2. Write a prediction or hypothesis with a scientific reason. (K/U, T/I)

3. Identify the variable or feature compared, the measured outcome and constants or consistent observation criteria. (T/I)

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Perform the virtual laboratory

Open the corresponding virtual lab and read Background Information. Follow the investigation instructions below. Record authentic simulated results; do not invent data.

Part A — Microscopy

• Examine onion epidermis and cheek epithelial cells at 40×, 100×, and 400× total magnification.

• Record at least four observations, including specimen, magnification, field of view, and visible features.

• Compare cell wall visibility and estimate how field of view changes with magnification.

Part B — Osmosis

• Choose plant tissue or animal cells and select at least five external solute concentrations.

• Run trials at a fixed exposure time and record initial and final relative mass or cell volume.

• Construct a graph of percentage change against external solute concentration.

• Identify the approximate isotonic concentration and explain the trend using water potential.

Record each completed observation using the simulator’s record control when available. Use Data & Graphs to review results. Export CSV if available; attach additional rows or screenshots when needed.

Record the exact settings and any changes to the method.

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Observations & results

Enter the actual results. Keep trial IDs consistent between continued tables. Attach the full exported data or extra sheets when the procedure requires more rows. Include units as displayed.

Data table 1

Trial / item	Slide	Magnification	Field diameter	Visible structures

Data table 2

Trial / item	Cell model	Concentration (mol/L)	Time (min)	Initial (relative)	Final (relative)

Data table 2 — continued (2)

Trial / item	Change (%)

Qualitative observations / sample calculation (show units where applicable)

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Analysis, conclusion & assessment

4. Present a labelled graph of a measured relationship, or an annotated diagram / comparison chart for qualitative investigations. Attach it separately. Explain the pattern using recorded evidence. (C, T/I)

5. Analysis: microscope field of view and cell structures (K/U, A)

6. Analysis: osmosis trends and approximate isotonic concentration (K/U, A)

Conclusion and evaluation: answer the research question, revisit the prediction using evidence, identify a model limitation and propose an improvement. (T/I, A)

Submit this assignment plus your completed Lab Report (printed or saved as PDF from the lab) and any supporting data/figures.

K/U: accurate concepts /10	T/I: method, data, reasoning /12	C: clear tables, units, report /8	A: explanation, conclusion, transfer /10

Total: /40