**Problem Posing Template for Individual Activity**

**Module Overview**: **Osmoregulation in plant cells is an activity where students apply their knowledge of concentrations, and data analysis and interpretation to discuss molecular movement across membranes (potato cells).**

**Setting**:

**Principles of Biology I, an introductory biology course for majors, 24 students, lab.**

Learning Outcomes for the activity-

**At the end of the activity, the students will be able to:**

1. **Describe concentration of a solution, and, calculate and prepare different concentrations of solutions**
2. **Perform experiments and collect data on movement of solvent in different concentrations over a period of time (change in mass over time)**
3. **Analyze the data to identify the isotonic point of a solution across the cell’s cytoplasm and its external environment**

How does data acumen align with this learning outcome? Place an “X” in the column next to the skills practiced in this activity

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Quantitative Pillars** |  | **Data Life Cycle** |  | **Social/Pedagogical Concepts** |  |
| Mathematical | **X** | Data import |  | Communication | **X** |
| Computational |  | Management |  | Equity, Diversity, Inclusivity |  |
| Statistical thinking |  | Curation |  | Universal Design for Learning |  |
| Reproducibility | **X** | Analysis | **X** | Ethics |  |
|  |  | Sharing/ Reporting | **X** |  |  |

**Activity/Module**:

Describe the activity-

1. Students will Prepare solutions of different concentrations.
2. Construct a standard curve with the absorbance data.
3. Measure change in mass of potato over time - in different concentrations.
4. Calculate the rate of change in mass, construct a graph and identify the isotonic point.

Course type (e.g. Lecture, lab)-

**Lab**

Pedagogy (e.g. Case, research project, final report, lab activity)-

**Lab Activity**

Describe the data and the tools used to interact with the data-

Experimental data will include calculation of concentrations of different solutions

Describe where problem posing will be used and how you as the instructor will use problem posing to shape the activity-

* What is the Question Focus?

**Concentrations of solutions impact life.**

* How is the Question Focus introduced?

The concepts will be discussed in the lecture and before the lab activity.

Describe the student products-

**Assessment**:

How will this learning outcome be assessed?

**Students will write up a lab report that will include the question asked, hypothesis, prediction, experimental design, data, analyzed results and interpretation.**

Will students practice this skill again?  In what setting (same topic, new topic)?

**Extra information**:

What will students need to know before completing this activity?