**Problem Posing Template for Individual Activity**

(Copy this template and share your ideas for incorporating problem posing in one of your courses. Share your work in the Collections.)

**Module Overview**: Activity to help students explore the processes of osmosis and plant development.

**Setting**:

Target course (title, majors/non-majors, level [introductory/upper-division], size of class [# of students], lab or lecture

Germination activity, majors & non-majors, introductory lab (25 students per section, 3 sections)

Learning Outcomes for the activity-

Learn how to formulate hypothesis and understand what a null hypothesis is.

Understand the cause-effect relationship.

Learn how to communicate scientific findings through oral and written forms.

Develop data entry skills.

Need for replication to account for error

Learning how to read scientific article

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

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

**Activity/Module**:

Describe the activity- Design an experiment to test the effect of various factors on seed germination. Enter time series data into a spreadsheet.

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

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

Describe the data and the tools used to interact with the data- Time series data, excel

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?

Teaching data entry skills and helping them understand how biological questions can be addressed using statistical approaches and hypothesis formulation.

* How is the Question Focus introduced?

By asking students what are some of the environmental factors that can influence plant growth and how one would go about testing it formally.

Describe the student products- Poster presentation and the submission of a small written document with figures and tables, manuscript style.

**Assessment**:

How will this learning outcome be assessed? Peer and self-evaluation of poster presentation. Demonstrate their ability to understand what a figure is representing.

Will students practice this skill again? Yes. In what setting (same topic, new topic)? New topics across various courses.

**Extra information**:

What will students need to know before completing this activity?

Some information about osmosis and plant growth and development.