**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**: Have students ask questions about vessel cell diameter, fiber cell frequency or amount of cell wall thickening as it relates to support, transport, or resistance to drought as part of their learning about stem anatomy, to encourage them to look at those aspects and think about how they could be measured or changes/distribution/development be assessed. Develop questions (1)looking back at their slides to develop ideas about measurements or how to approach (2)examine data from papers to see data and look at what type of methods were actually used (3) and/or data bases to explore some answers using data sets. This could be used to tie in stems, roots, and leaves information, so come back to these questions in the subsequent two labs (Stems, roots, leaves labs or stems, leaves and roots labs order).

**Setting**:

Target course Introductory Botany, size of class each lab is 11-18, total 10 section (145 students total) we also have a 50 min discussion session that could be used in conjunction with the activity starting in the lab session (2@2h labs per week such as MW lab Th discussion)

Learning Outcomes for the activity-

show familiarity with structural support in vascular tissue (fibers, secondary cell wall thickening)

able to develop a question about importance of these structures in function/stress tolerance

able to discuss/examine methods for measuring such features of cells

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 | x | Data import | x | Communication |  |
| Computational |  | Management |  | Equity, Diversity, Inclusivity |  |
| Statistical thinking | x | Curation |  | Universal Design for Learning |  |
| Reproducibility |  | Analysis | x | Ethics |  |
|  |  | Sharing/ Reporting | x |  |  |

**Activity/Module**:

Describe the activity-

Pose, type open/closed, and prioritize some questions

Question Focus: What questions do you have about the role of secondary cell wall thickening and fibers in stem support, water transport or resistance to embolism/collapse under water stress

Type: which of the questions were open/closed? Could you convert O-> C. C->O.

Priority Focus: features that could be measured or could be critical to understanding an idea about distribution, growth, drought. Pick three of your questions

Either giving the students some articles to browse or using the questions, instructor brings several graphs/methods to use for analysis from articles. To pick out for analysis

-main idea is to have them look at some data and derive information

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- jarticle graphs, open data set

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?
* How is the Question Focus introduced?

Describe the student products-

**Assessment**:

How will this learning outcome be assessed?

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?