**Problem Posing for Developing Dichotomous Keys**

**Module Overview**: Students will use data collected from the class to develop dichotomous keys for identifying an unknown organism.

**Setting**:

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

* Undergraduate microbiology course (soph/jr)
* Lab
* 20-30

Learning Outcomes for the activity-

* Learn how to identify trends
* Identify outliers
* “Clean data”
* Collect data and make a curated list of observations
* Share info with others
* Analyze trends and make hypothesis based on trends
* Communicate findings to peers
* Importance of data integrity

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

**Activity/Module**:

Describe the activity - each group (or student) tests a set # of micro organisms for their reactions on selective and/or differential media. These observations are collected as a class. Students use these data to create a class consensus about the “true” reaction (pos/neg/nothing/unknown/unclear) for each test and each organism. From there, each student will create a dichotomous key that will be used in the unknown practical exam.

Course type (e.g. Lecture, lab)- lab. This is an activity that collects student data from many experiments and directs future experiments.

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

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

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? Microorganisms can be identified using dichotomous keys.
* 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?