**Problem Posing**

**Module Overview**: Relevancy/importance of basic chem to basic biology.

**Setting**:

Target course- Title, majors/non-majors, level [introductory/upper-division], size of class [# of students])

* **Intro Bio for Majors 1st semester, 48 students**

Learning Outcomes for the activity

* Learn how to askmeaningful questions that could be answered scientifically about a biological problem
* Research answers using text, periodic table, other academic resources
* Restate information found into own words.
* Identify and learn appropriate ways to utilize periodic table.

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 |  | Equity, Diversity, Inclusivity |  |
| Statistical thinking |  | Curation |  | Universal Design for Learning |  |
| Reproducibility |  | Analysis | **X** | Ethics |  |
|  |  | Sharing/Reporting | **X** |  |  |

**Activity**:

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

* Lecture

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

* Problem-posing activity

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

* Students respond to Question Focus on first exam (which is over biological molecules)

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

* Question Focus: “CHO, PRO, Nucleic Acids, Lipids are all build from the same basic set of atoms (C, O, N, H, P).”
* How is the Question Focus introduced?   
  1st - Question will be given on Exam 1 at the end of the unit on biological molecules. The Question Focus concept and topic will be introduced in class ahead of the exam.
* Describe the activity-   
  2nd - Student responses will be grouped by instructor and presented at next class.   
  3rd - Clarification and formalization of questions will be done in class discussion.
* Describe the student products  
  4th - Questions will be assigned for everyone to answer, working in groups if desired.   
  5th – Students turn in answers; material will be discussed in class as well.

**Assessment**:

How will this learning outcome be assessed?

* Students will earn points for answering questions. Exam 2 will cover basic chemistry concepts.

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

* Yes. Students will also complete this exercise at the end of Exam 2: Question focus: “Biological molecules provide structure and energy for all living organisms.”

**Extra information**:

What will students need to know before completing this activity?

* Students will need to complete Unit 1 material about biological molecules.