**Teaching Science as Inquiry (TSI) Lesson Plan**

**Module 3: Biological Aquatic Science**

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Activity: Modeling Microevolution

1. Why did you choose to do this activity?

I completed the Phases and Modes lesson plan, so this is one of my options for Mod 3.

2. What are your classroom learning goals?

*Students will…*

1. determine effects of microevolution on a population of bacteria.

2. relate microevolution to time, survivorship, reproductive ability, and size of population

3. How does this activity tie into your classroom learning goals?

I am introducing Probability in Math class this week and this lesson will help with the concept.

I am interested in my students discovering the concepts of evolution as they have not covered much of this topic in school to date.

4. What date do you plan to start this activity? 4/2/13

*5. If applicable:* HIDOE standards this lesson will address

SC 5.2.1 Use models and/or simulations to represent and investigate features of

objects, events, and processes in the real world.

**Ocean**

6. Describe how you will connect this activity to the ocean:

We will discuss how animals of the ocean have evolved or not evolved much over time. We will discuss why we think this may have occurred in the ocean.

7. Select the Ocean Literacy Principle(s) that you anticipate this activity will address. (check all that apply)

□ 1. The Earth has one big ocean with many features.

□ 2. The ocean and life in the ocean shape the features of the Earth.

□ 3. The ocean is a major influence on weather and climate.

□ 4. The ocean makes earth habitable

X 5. The ocean supports a great diversity of life and ecosystems.

□ 6. The ocean and humans are inextricably interconnected

□ 7. The ocean is largely unexplored

**Preparation**

8. How will you prepare your students for this activity? (For example, review of prior knowledge.)

I will lead a review the demeanors of scientists to remind students how they can accomplish lesson goals with best scientific practices.

I will begin the lesson using the slides provided for Module 3 to stimulate curiosity and interest.

9. Explain any instructional struggles that you foresee and how you will address these issues. (For example, student misconceptions, classroom discussion, aspects most difficult for students to grasp, etc.)

We will discuss student understanding of the Theory of Evolution and use the Evolution by Natural Selection Misconceptions chart to clear up misperceptions.

10. What ***TSI inquiry*** *questioning strategies* will you use to help your students meet your learning goals?

I will begin with questions about any prior knowledge on the topic.

I will ask for predictions for the activity. What will happen to the bacteria/

Why do you think you are getting the results you have listed?

Why do you think genetic evolution happens to the entire population of bacteria?

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| Use the following table to plan your lesson using TSI. For each phase:* **Teacher:** Describe what you will be doing
* **Student:** Describe what your students will be doing
* **Assess:** Describe how you will assess your students in this phase so you can monitor their progress through the activity
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| --- | --- |
| **INTERPRETATION** | **INITIATION** |
| Teacher | Will list results on board to class comparisons and discussions | Teacher | Will begin lesson with Mod 3 slides and misconceptions to build interest/ Will connect the lesson content to the ocean with class discussion |
| Student | Will provide data from investigation and make any connections and analyses | Student | Will participate in initial class discussion and reveal any prior knowledge |
| Assess  | Teacher will look for accuracy in student understanding and communications. | Assess  | Teacher will listen to answers and conversations to assess prior knowledge and initial understandings |
| **INSTRUCTION** |
| Teacher | Will facilitate all discussions and use questioning strategies to guide studentsWill lead/guide classroom discourse on lesson content and results |
| Student | Will follow directions practicing the demeanors of scientistsParticipate in lesson activities and communications |
| Assess  | Teacher will assess by listening for answers to questions and check that students are following the directions given |
| **INVESTIGATION** | **INVENTION** |
| Teacher | Will observe student actionsSee that students are repeating steps needed to complete experimentRecord results on board | Teacher | Will question students prior knowledge and gather ideas and understandingsAsk for predictions |
| Student | Will manipulate the technology to achieve test results and record dataCarefully repeat steps in lesson | Student | Will participate in making predictions |
| Assess | Teacher will record data on boardObserve students | Assess | Teacher will cover any misconceptions to correct with studentsHelp students in making predictions |

11. Briefly describe how you will guide your students through the TSI Phases of Inquiry. (You are the research director of your classroom, and thus guide or facilitate the learning in your classroom, even if an activity is very student-directed).

I expect this lesson to flow through the Inquiry Phases beginning with Initiation, followed by Invention, Investigation, and Interpretation. While students might return to some previous Phase during the process, I think we will generally follow the above plan.

12. What *overarching* TSI mode(s) will you focus on for this activity? Why?

Modes: Curiosity, Description, Authoritative knowledge, Experimentation, Product evaluation, Technology, Replication, Induction, Deduction, Transitive knowledge

Replication: Students will need to repeat steps in the lesson in order to simulate the death of the bacteria. Students may also try to replicate each other’s test results.

Please provide any additional comments that will help you prepare to teach this activity or help the TSI facilitators understand how you plan to teach this activity.

By familiarizing myself with the procedure, I can focus on the lesson content more effectively during the class.