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

**Module 3: Biological Aquatic Science**

Name: *Dan VanRavenswaay*

Activity: *Modeling Microevolution*

1. Why did you choose to do this activity? *This is one of the required activities.*

2. What are your classroom learning goals?

 *I want my students to understand the workings of natural selection.*

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

 *Biology and ecology, including natural selection, are part of my marine science*

 *course.*

4. What date do you plan to start this activity? *Monday, February 25, 2013.*

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

**Ocean**

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

*Given enough time, and populations that include sufficient genetic diversity,*

*those populations may be able to change to better survive in their environment.*

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.)

*In short, I am intentionally planning to not “prepare” the students for the activity.*

*My intention is to run the activity as a game, pretty much as written; and then together with the activity questions, add in the basics of natural selection, remind them of previous discussions we’ve had about artificial selection, and refer to the trends we saw during the activity during our discussion.*

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.)

*The activity itself may take a few minutes to get rolling, and I usually have to deal*

*with a bit of confusion about how and where to add the data/results to the tables*

*provided.*

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

*Any and all as needed: clarifying, extending, focusing, lifting and summarizing.*

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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 | Pose discussion questions following the activity.  | Teacher | Introduce the activity as a game.  |
| Student | Answer discussion questions.  | Student |  |
| Assess  | Participation in discussion.  | Assess  | Signs of enthusiasm.  |
| **INSTRUCTION** |
| Teacher | Explain rules of the activity. Explain basics of natural selection.  |
| Student | Ask and answer questions .  |
| Assess  |  |
| **INVESTIGATION** | **INVENTION** |
| Teacher | Supervise data collection.  | Teacher | Encourage students to pose questions during the discussion(s) following the activity.  |
| Student | Perform tasks to collect data for discussion | Student | If there are any “What if…” questions I may ask if the student could propose a modification of the activity that might test their question.  |
| Assess | Successful completion of data collection.  | Assess |  |

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’ll initiate the activity, introducing it as a game. That, and the presence of dice will grab their attention. They will need some coaching on my part as they start and run their investigation, collecting and calculating mortality and reproduction data for analysis.*

*I’ll have to take the stage for a while as the “expert” as we address the activity questions and attempt to interpret how observed trends explain how natural selection works.*

*I have a few students who will probably ask “What if…” questions along the way, and hopefully they will be something that we can turn into a test and try in the time we have. I have a modified version of the activity that I hope to try out.*

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. The central activity requires doing the same thing over and over again to create enough data to observe trends in the changes of the frequency of the two genotypes.*

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.