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

**Module 3: Biological Aquatic Science**

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Activity: Micro-Evolution

1. Why did you choose to do this activity?

I wanted to align it with the Math we have been studying, probability and creating graphs/plotting points.

1. What are your classroom learning goals?

Making cross curricular transitive knowledge to have students be able to apply probability knowledge to the theory of evolution and see trends when plotting graphs.

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

Perfectly by having graphs and incorporates math skills.

4. What date do you plan to start this activity? 2/5

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

**Ocean**

6. Describe how you will connect this activity to the ocean: That bacteria and mutations occur in all living things. Adaptation & Mutation occurs everywhere.

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.

X 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.

X 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.) Review probability and Science concept of evolution which we studied earlier in the year with regards to changing environment and also with Malama Aina study. Malama Aina had a “game” whit each generation the utensil/bird beak changes…try to get the seeds into the bottle…use knife, fork, spoon…depending on “evolutionary changes”….”which allows the species to survive? “

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.)

since we have shared about this information before in both science and social studies . I hope and anticipate that the students will grasp this easily and find it a fun interesting activity.

10. What ***TSI inquiry*** *questioning strategies* will you use to help your students meet your learning goals? Use of instruction to set up the activity, relate it to prior knowledge and assist the students by having each table chart their findings on the graph and refer to it to find the trends in the activity.

Use of “summarizing” questions: “What does the graph show us?” “Can we share that in a sentence?” or “focusing” questions: “Lets look at the data we collected on the graph. Do we find similarities and differences?” “If so, what to those similarities and differences tell us about the data we’ve collected?”

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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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This part always confuses me….but hopefully, I will be able to fill it out better this time?

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| **INTERPRETATION** | **INITIATION** |
| Teacher | I will be asking students clarifying questions so that they can come to their own conclusions and interpretations of the data based on the probability of the roll the dice to see if the organism lives or dies…evolution of generations | Teacher | Discuss the prior knowledge of changes in species based on activities done earlier this year with MAlama Aina and in social studies in films we watched and class discussions and worksheets on climate change and species changes |
| Student | Student will roll the dice and record if the organism lives or dies | Student | Will share with others in our discussion of prior activities in preparation of the dice activity |
| Assess  | Student is able to determine if the organism lives or dies based on the roll of the dice and is able to record the data on their chart | Assess  | Student will roll the dice and see through each generation which bacteria lives or dies…mutated or original |
| **INSTRUCTION** |
| Teacher | Allow students to work in groups to read the instructions and share with one another their findings |
| Student | Will work in small groups to do the activity and share with one another |
| Assess  | Students will be able to graph their findings and relate it to the understanding of trends in evolution |
| **INVESTIGATION** | **INVENTION** |
| Teacher | I have no idea…supporting the students as they roll the dice and record the data | Teacher | I don’t think there will be any new invention |
| Student | Rolls the dice and records the data each time on the chart and then graphs their findings as a group | Student | Perhaps has an ah moment in making the connection between prior knowledge and this activity?  |
| Assess | Are students able to graph their findings and recognize that the graph shows the trends in the data reported | Assess | Will student be able to relate this also to probability in Math…that is the hope |

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).

We will introduce the concept of evolutionary changes based on environment. We have had this before. The tools person will pass out the items needed for this activity. The students will work in their table groups to roll the dice and collect the data on each “generation” then graph their findings and share together as a class to see the trends and summarize our study.

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

I am hoping to focus on transitive knowledge since the topic is semi prior knowledge, the activity is new, but we have done some probability in Math, talked about climate changes in both social studies and science and this activity combines all of the above. I want students to see that all the disciplines of study are interrelated and dependent on one another.

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.

We just had probability the week of our training so I am excited to do this activity first. I think they will find it fun and be engaged and “get it”.

Mahalo.

Terri