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

**Module 4: Ecological Aquatic Science**

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Activity: Sampling Design (M&M activity)

1. Why did you choose to do this activity? We have been studying probability in Math and doing data graphs. The timing for this fits in perfectly.

2. What are your classroom learning goals? To chart for data collection and to see error in sample methods

3. How does this activity tie into your classroom learning goals? This activity ties into these goals perfectly.

4. What date do you plan to start this activity? April 22

5. *If applicable:* HIDOE standards this lesson will address 6.1.2 & MA: 6.9.1, 6.11.1, 6.12.1, 6.12.2 & 6.13.1

6. Describe how this activity relates to at least one of the TSIA PD Themes.

Themes: Community, Metacognition, Science as a Human Endeavor, Observations and Inference, Modeling Science, Scientific Language, Connections

OBSERVATIONS AND INFERENCE: Observing the colors of M&M’s is a concrete example or extending into observations in Nature and making Inferences.

**Ocean**

7. Describe how you will connect this activity to the ocean: by exploring how samples can be taken re water or animals/organisms that live in the ocean

Principle 7: The Ocean is Largely unexplored.

8. 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

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

□ 6. The ocean and humans are inextricably interconnected

X 7. The ocean is largely unexplored

**Preparation**

9. How will you prepare your students for this activity? (For example, review of prior knowledge.) re: our recent field trip to Mini Golf. Examine our “data collection” and look at Mean, Median, Mode intro and review averages and %.

10. 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.)

Explaining the misconceptions of graphs. They may be hard pressed to “get it”, especially since they are learning how to create them to show comparisons. However, it is a great learing opportunity and ties right into what we are doing.

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

What types of questioning or approaches to discussion will you take to support student

engagement and learning? See questioning handout for suggestions (Mod 3 Binder under “TSI Pedagogy and online in Mod 3 PD section)

Focusing and Summarizing

Our class can always sue focusing questions and the graphs will help us create a summary of the data we are focusing on trying to collect and examine together.

12. What ***TSI practices of inquiry teaching strategies*** will you focus on implementing to help your students meet your learning goals?

See TSI Practices of Inquiry teaching strategies handout for suggestions (Mod 4 Binder under “TSI Pedagogy” and online in Mod 4 PD section)

* Utilize a range of inquiry activities, from directed to open-ended
* Allow students to design and refine models
* Provide access to multiple sources of information
* Connect new information to prior knowledge
* Develop student interest and make knowledge relevant through use of place and everyday situations, interests and life experiences AND societal or personal concerns

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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 | Guides discussion by questioning so students feel they are creating the experiment to examine the bag of M&M’s | Teacher | Shakes a bag of M&M’s |
| Student | Begins to formulate strategies for discovering contents or samples of the bag | Student | Is curious why and wants the bag |
| Assess  |  | Assess  |  |
| **INSTRUCTION** |
| Teacher | Asks students to design a means to randomly but also standardizing for the class |
| Student | Shares with the class ways and means to create a sample until a method is agreed upon |
| Assess  |  |
| **INVESTIGATION** | **INVENTION** |
| Teacher | Holds the bag and assists each student to gather the agreed upon sample | Teacher | Continue to hold space in guiding but allowing the students to design the method for sampling |
| Student | Take the sample and record data on chart | Student | Decide how to take random sample from the bag |
| Assess |  | 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 guide by questioning and allowing for student driven response. We also record our modes in the phase chart as we move along with the experiment.

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

Curiosity, Replication & Authoritative Knowledge

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.

Our o’lelo for this week is Nana ike Kumu. “Look to the source”

Authoritative knowledge. We looked to the company for the % of colors per bag.