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

**Module 3: Biological Aquatic Science**

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Activity: Practices of Scientists

1. Why did you choose to do this activity?

I chose this activity, first of all, because it was a mandatory activity for module 3. However, it was an activity that fit very nicely into the scope and sequence of my science curriculum, so it turned out to be a largely positive experience for both my students and myself.

2. What are your classroom learning goals?

 I will be able to:

* Define and give an example for each of the 10 practices of scientists
* Apply the practices of scientists to a previous activity, telling which of the practices we exercised in that activity

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

 This activity helped me generate learning goals for the day. We took a break from the state standard we had been working on and returned to Standard 1: The Scientific Process.

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

 March 6th

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

Standard 1: The Scientific Process: SCIENTIFIC INVESTIGATION: Discover, invent, and investigate using the skills necessary to engage in the scientific process

**Ocean**

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

The activity was not related to the ocean at all.

I could have related the activity to the ocean by choosing an ocean-related mystery object, but I ended up going with a radiometer instead.

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

□ 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.)

 Students will be coming off the “Language of Science” activity from the previous week and I will refer back to that activity and the discussions we had about the community of science and the ways that community communicates and conducts business in order to activate some prior knowledge.

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.)

I foresee students struggling with the sheer amount of terms, definitions, and examples that will be presented in this activity. I remember fellow TSI-er Brittany Driggs mentioning in her blackboard presentation that both she and her students were losing enthusiasm by the time the lesson progressed to the sunscreen and light bulb examples. To remedy this potential problem, I am breaking the lesson into two days – one day to cover the introduction, scenario 1, and the first 4 terms and a second day to cover scenarios 2 and 3 and the final 6 terms.

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

I plan to use is extending questions to push students to provide examples for each of the practices of science after I have presented the term and had them record the definition. This will give the students more context for the practices of scientists, helping them to see just how important they are.

I plan to use extending questions at the conclusion of the lesson to have students choose a lab that we have done and explain as many practices of scientists that we exercised during that particular activity.

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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 prompt students to choose a lab experiment we have done and verbally review the practices of scientists that we exercised in doing that particular activity. | Teacher | Engage students through the use of props (wrapped box, mystery object, sunscreen, and light bulb) as well as curiosity-arousing questions and narration. |
| Student | Mentally reviewing a lab activity and verbalizing which practices of scientists were exercised and explaining how. | Student | Listening to teacher, participating by both volunteering for tasks and volunteering answers. |
| Assess  | Are students engaged and participating? Are they able to synthesize an answer and explanation? | Assess  | Are students actively contributing by their actions and words? Are they attentive?  |
| **INSTRUCTION** |
| Teacher | At appropriate times during the scenarios, I will display a PowerPoint slide with the practice of scientists and a definition on it. I will then take the role of facilitator and lead students to a real-life example |
| Student | Silently listening with eyes on the teacher and hands raised silently to ask questions. They will be recording definitions on their note sheets. |
| Assess  | Are students silent with their eyes on me? This will tell me: Are they listening? Also, are students recording ALL of the definition? |
| **INVESTIGATION** | **INVENTION** |
| Teacher | Will facilitate students opening packages and handling and examining the mystery object. | Teacher | After I put each word up on the PowerPoint with it’s definition and a descriptive picture, I will prompt students to come up with a real-life example |
| Student | Will be shaking, examining, passing around, and opening the mystery object. They will also be carefully examining the mystery object. | Student | Will engage in a dialogue for each of the 10 practices of science to synthesize a real-life example of that practice. |
| Assess | Are ALL students actively engaged in the activity? Are they working cooperatively? | Assess | Are all students engaged in the discussion? Can they synthesize a real-life example? |

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).

Initiation –

* Lesson introduction: Just like it’s special language, scientists have special practices.
* Bringing out wrapped packages, having students guess what is inside.
* Bringing out a mystery object and having students guess what it is.
* Describing the sunscreen experiment.

Instruction –

* During the scenario, when I reach a place to present a new practice, I will put up a PowerPoint slide with the word, a definition, and a descriptive picture.

Investigation –

* Hands-on exploration and opening of the wrapped packages
* Hands-on exploration of the mystery object

Invention –

* After the definition of each new practice, I will prompt students to synthesis a class example of that practice in a real-life (hopefully scientifically-based) situation

Interpretation –

* Students will choose an activity that we have done in class and explain what practices we exercised during the activity.

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

Authoritative Knowledge – An overarching mode because the teacher will play a large role in both guiding the scenarios, pausing the scenarios, and utilizing the scenarios to present and explain the 10 practices of scientists

Curiosity – All 3 scenarios are geared towards arousing the curiosity of students through guessing, 20 questions, etc.

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.