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

**Module 3: Biological Aquatic Science**

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Activity: Scientific Language

1. Why did you choose to do this activity?

This is a required activity, but I also think it’s a good opportunity to introduce or review these vocabulary words with students, and give them concrete examples of each (hypothesis, opinion, theory).

2. What are your classroom learning goals?

* Students will be able to distinguish between a hypothesis, opinion, and theory.
* Students will be able to classify examples as a hypothesis, opinion, or theory.

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

Students will learn the definitions of each word, and then take notes from the TSI article on the important details about each word. Then students will work with their partner to explain how each word is used wrong in Question Set 1. Each student will be given an index card with a word (H, O, T), a definition, or an example. They will have to find their matching group, and then explain why their group classified the examples as an H, O, or T.

4. What date do you plan to start this activity? 3/27/13

*5. If applicable:* HIDOE standards this lesson will address: Standard 1, 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:

Some of the examples the students will use in the classification portion of the activity is tied to the ocean. The bellringer question is also tied to 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

□ 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**

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

Students will start the lesson with a bellringer prompt, “Describe to me an opinion you have about Kauai beaches.” The class will then read the first paragraph of the TSI article together, and students will discuss with their partners their predictions on what each of the words mean (H, O, T). After sharing their predictions with the class, I will guide them through a note-taking process to identify the important details about each word by continuing to read the rest of the TSI article.

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.)

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| INSTRUCTIONAL ISSUES | HOW I WILL ADDRESS THE ISSUE |
| Students may not take detailed enough notes to fully understand the 3 words | I’ll follow the “I do, we do, you do” method of instruction and will model how to fill in the graphic organizer I’m providing. The class will not do the “you do” part, meaning that I’ll either be modeling the note-taking, or we’ll do the note-taking together as a class. |
| Due to lack of background knowledge, students may have trouble identifying the examples of “Theory” | As I’m monitoring the classifying portion of the activity, I’ll keep an eye on the students who were given the Theory examples, and address any confusion. |

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

* Extending: When groups are presenting their reasoning for classifying the provided examples as H, O, or T, I may have to use this strategy to pull more details out of their answers.
* Focusing: I used my own examples to make them more relevant to my students. Some students might get off track when reading through examples, so I will have to make sure that I get them focused back on their task.
* Summarizing: When taking notes on the three words, I’ll emphasize to the students that we need to rewrite the main points in our own words.

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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 | Provide class instructions on how to complete the lesson. Monitor students as they are working with their partners. | Teacher | Present bellringer question to students. Give examples of opinions if students are unsure of the word. |
| Student | Working with a partner, the students must choose one opinion and one hypothesis that were shared in the Investigation Phase. Students will do Questions #3 and #4 in the student guide. They will then work independently to do the 2 follow-up questions. | Student | Answer bellringer question in their journals. |
| Assess | Grade on this assignment will be determined by the students’ answers in the Interpretation phase. | Assess | Randomly call students with popsicle sticks to share their opinions of Kauai beaches. |
| **INSTRUCTION** | | | |
| Teacher | Model for students how to take notes using the graphic organizer by reviewing the paragraph on Hypothesis. Then facilitate the process of note-taking for the other paragraphs on Opinion and Theory. | | |
| Student | Follow along while the teacher models the paragraph on Hypothesis. Work with their partner or group to identify the main points of Opinion and Theory, and share with the class if called upon. | | |
| Assess | Students will be monitored to make sure they are actively participating in the note-taking discussion. Random students will be called with popsicle sticks to share with the class what they think are the main points of the Opinion or Theory paragraphs. | | |
| **INVESTIGATION** | | **INVENTION** | |
| Teacher | Post the examples listed in Question Set 1. Facilitate a class discussion on how the words are used wrong in each example. Pass out index cards and provide instructions on how to do the classifying activity. | Teacher | Post the TSI article on the board and read the first paragraph out loud to the students. Give them the verbal prompt of making a prediction on what each of the words mean. |
| Student | Investigate why the words are used incorrectly in Question Set 1. Process their newly-learned content by finding other students with index cards that match their own. | Student | Discuss with partners on their predictions of what H, O, and T are. Share with the class. |
| Assess | Groups will present their word (H, O, T), the definition, and examples. They will also explain to the class why they classified their examples in their group. | Assess | Each student pair will have to share their predictions for one of the words. |

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 will make a concerted effort to point out to the students which phase of inquiry we are in as we proceed through the activity. If I feel the students are up to it, I might try to have the students identify which phase they think they are currently in at different points throughout 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

* Description: Students will be asked to give detailed answers when giving explanations throughout the activity.
* Authoritative Knowledge: Students will learn specific definitions and important details about hypothesis, opinion, and theory through reading an article.

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.

I will follow the TSI guide, with a few changes:

* Making some of my own examples so that students can connect to them more
* Classifying portion of the lesson will be done by matching index cards
* Students will only choose one opinion and one hypothesis when answering the questions at the end of the activity
* I’m taking out the last question about Theory, because I’m not sure if my students have enough background knowledge to be able to describe evidence that would support each theory example.