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

**Module 3: Biological Aquatic Science**

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Activity: Modes of Inquiry

1. Why did you choose to do this activity?

This is one of the mandatory lesson plans for Mod 3. I is an ongoing lesson with my class

2. What are your classroom learning goals?

Students will begin to understand the many different ways scientists practice Inquiry.

1. How does this activity tie into your classroom learning goals?This activity helps my students understand the Modes of Scientific Inquiry, introduces them to new vocabulary and has them thing about their learning.

4. What date do you plan to start this activity? Februrary 19, 2013

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

**Standard 1: Scientific Investigation—Discover,** [**invent**](http://165.248.30.40/hcpsv3/search_results.jsp?contentarea=Science&gradecourse=Marine+Science&strand=&showbenchmark=benchmark&Go%21=Submit##)**, and investigate using the skills necessary to engage in the scientific process**

**Ocean**

6. Describe how you will connect this activity to the ocean: Students will be investigating Ocean Acidification as they practice the modes of scientific inquiry

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.

x□ 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.)

We will review the terms for the Modes of Inquiry

1. 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.) Students will not understand the terms and how to apply them to their activiy

10. What ***TSI inquiry*** *questioning strategies* will you use to help your students meet your learning goals? I will practice Focusing discussion and Accepting and Clarifying.

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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 | Look for understanding in the labeling of the steps of scientific practice that students carried out | Teacher | I will ask students how do you learn new ideas? How do you gain knowledge? |
| Student | Will describe the Modes of Inquiry in the steps of scientific investigation | Student | Students will respond and discuss these thought questions |
| Assess | Question for clarification and description in the Modes of Inquiry | Assess | Listen for understanding and clarification |
| **INSTRUCTION** | | | |
| Teacher | Show students the terms for Modes of Inquiry posted in the wall. Pass out the descriptions of the terms and go over them to clarify | | |
| Student | Read the terms and descriptions to use them in their activitiy | | |
| Assess | Look for use of the terms in Modes of Inquiry among student peer groups | | |
| **INVESTIGATION** | | **INVENTION** | |
| Teacher | Introduce the activity “Ocean Acidification” for the students to investigate | Teacher | Can students incorporate at least five of the terms of Modes of Inquiry in their activity? |
| Student | Students carry out the activity of “Ocean Acidification” and record their Modes of Inquiry for the investigation | Student | Will use at least five of the terms of Modes of Inquiry in their activity they are reflecting upon |
| Assess | Look for the use of the terms of Modes of Inquiry in their activitiy | Assess | Look for the use of the term of Modes of Inquiry in the student worksheets as a group |

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).

In this activity, Ocean Acidification, students are to think about and record the Phases and Modes of Inquiry as they conduct the experiment. I will give instruction, demonstrate, and question students.

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 will focus on Curiosity, Description, Authoritative Knowledge and Experimentation. Students will be investigating causes of ocean acidification using yeast as a producer of carbon dioxide. They will measure the amount of carbon dioxide produced and how it affect the pH of water. This is a model of environmental issues with carbon dioxide in the atmosphere and ocean acidification.

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.