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

**Module 2: Chemical Aquatic Science**

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Activity: Processes of Inquiry- An Introduction to the Modes of Inquiry

1. Why did you choose to do this activity?

To introduce the process of metacognition and student awareness regarding the various phases they engage in during a lab or lesson..

2. What are your classroom learning goals?

* Introduce the concept of metacognition
* Familiarize students with different modes of scientists
* Understand that the scientific process is not strictly linear

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

This activity will introduce new vocabulary, ideas, and concepts to aid in the metacognative process that students will engage in throughout the semester.

4. What date do you plan to start this activity? 1/3/13

*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:

It was emphasized that the metacognative process could be applied to any type of research, or experimental process. Our class will use the Cohesion/Adhesion activity to reflect upon for this activity.

7. Select the Ocean Literacy Principle(s) that you anticipate this activity will address. (check all that apply)

X 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 were instructed during the adhesion/cohesion lab to be aware of their thinking and to try and remember how they were feeling during the various parts of the lab.

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 feel it will be a challenge to keep students engaged in an analysis of their thoughts. It may be hard to remember what they did during the adhesion and cohesion lab which was before the break.. To address this we will pass back their labs so they have it to reference in front of them and summarize the experiments that we did.

**Questioning and Assessment Strategies**

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

I will use the questions and template provided in the teacher’s guide.

11. What *assessment strategies* will you use to help your students meet your learning goals and monitor their progress? I will monitor students by their responses to the activity questions.

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| Use the following table to plan your lesson using TSI.  For each phase:   * **Mode(s):** List the Mode(s) of Inquiry you will incorporate * **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   \*Modes: Curiosity, Description, Authoritative knowledge, Experimentation, Product evaluation, Technology, Replication, Induction, Deduction, Transitive knowledge |

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| **INTERPRETATION** | | **INITIATION** | |
| Mode(s) | Deduction | Mode(s) | Curiosity |
| Teacher | Answering any student questions, | Teacher | Opens class with “alternative activity” fish tank discussion to initiate student investment in the process that follows. |
| Student | Answering questions in the lab activity guide related to the phases and modes | Student | Engages in class decision making and discussion, shares ideas with the class as to the order of operations. |
| Assess (look for) | Accuracy of student response | Assess (look for) | Reasonable response, active participation and listening |
| **INSTRUCTION** | | | |
| Mode(s) | Authoritative knowledge | | |
| Teacher | Covers vocabulary and related classroom activity examples | | |
| Student | Taking notes, asking questions, reading activity instructions | | |
| Assess (look for) | listen, ask questions, take notes | | |
| **INVESTIGATION** | | **INVENTION** | |
| Mode(s) | experimentation | Mode(s) | replication |
| Teacher | Monitors student progress | Teacher | Demonstrating use of the phases poster |
| Student | Works with partner on placing phases | Student | Learning the process for identifying the phases and modes |
| Assess (look for) | Completed work | Assess (look for) | Students can begin to place tasks into phases |

12. Briefly describe how you will direct your students through the Phases of Inquiry.

The initiation is the alternate fish tank scenario. Then Instruction where we cover the vocabulary. Invention follows this where we decide how to record our modes. Finally we investigate and interpret our thoughts and modes using the cohesion and adhesion lab as an example.

13. What will be the *overarching* mode(s) of this activity? Why?

The overarching modes will be curiosity and experimentation. Curiosity is evident throughout the exercise as we try to understand our thinking. Experimentation because we are playing out several scenarios to determine or thought processes.

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.