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

**Module 2: Chemical Aquatic Science**

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Activity: Phases and Modes of Inquiry

1. Why did you choose to do this activity?

It is a required lesson for students to understand the “thinking process” of inquiry that scientists use. Through demonstration students are able to clearly see the process during an actual lesson.

2. What are your classroom learning goals?

Ultimately, the goal is to cover the 7th grade life science standards, then to develop the students’ interest into becoming lifelong learners with a curiosity to learn about the world around them using an investigative, problem solving strategy. I would also like to see the student evolve through maturation in working independently so they are self-reliant while able to get along with others who are different from themselves. To accomplish this, the class is taught using differentiation so all students get varied modes of instruction so all can succeed. I use standardized grading so students learn to turn in quality work the first time and learn to revise work that is does not meet their/parents’ standard.

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

Students were able to see different modes of inquiry demonstrated by themselves, their peers and instructor. The problem solving process through natural curiosity is clearly observed by students who are mostly concrete learners.

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

Thursday and Friday, January 3-4, 2013, Monday, January 7 and Wednesday, January 9, 2013.

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

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| **Benchmark** [**SC.7.1.1**](http://165.248.30.40/hcpsv3/imr/report_by_code.jsp?code=SC.7.1.1) | Design and safely conduct a scientific investigation to answer a question or test a hypothesis |
| **Benchmark** [**SC.7.1.3**](http://165.248.30.40/hcpsv3/imr/report_by_code.jsp?code=SC.7.1.3) | Explain the need to revise conclusions and explanations based on new scientific evidence |

**Ocean**

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

Students can understand that the ocean contains a variety of ocean life.

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

X 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.)

1. Show students one video (Ocean). Students will view a variety of ocean creatures that live at different depths in the ocean, how the ocean is formed as well as how the ocean influences weather and climate.

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.)

Instructional struggles include a full class of just under 30 students where only a few volunteers can be utilized to demonstrate each mode of inquiry. Volunteers were used to share the limited resources and stood in front of the class for visual means.

**Questioning and Assessment Strategies**

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

 The teacher will answer students’ questions with further questioning that leads them to the lesson’s concepts while allowing students to keep their thinking open-minded.

11. What *assessment strategies* will you use to help your students meet your learning goals and monitor their progress?

1. Students will participate in groups then assess other small partner groups in their researched animal sharing.

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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) | Authoritative Knowledge, Induction, Deduction | Mode(s) | Curiosity, Description, Authoritative Knowledge |
| Teacher | Analyze and review student researched information on the unusual object, mystery boxes and ocean creature | Teacher | Ask students what they know about the unusual item or mystery boxes; students to go through the K-W-L process to find out about their ocean creature to research and share |
| Student | Share researched information with their partner and in a class presentation about the unusual object, mystery boxes contents and/or ocean organism | Student | Show interest in the unusual object and ask about the mystery boxes; Students discuss with partner and record what they K (know) about the ocean organism they chose |
| Assess (look for) | Complete K-W-L worksheet on researched ocean organism; rubric for oral presentation of ocean creature with peers | Assess (look for) | Observe excitement from students about unusual object or the mystery boxes; Review the information students recorded on their paper in the K column on what they presently know about the ocean organism |
| **INSTRUCTION** |
| Mode(s) | Curiosity, Authoritative Knowledge, Description  |
| Teacher | Display modes of inquiry colored cards on board and orally review each card with vocabulary summary sheet with students; show ocean video |
| Student | Read and understand modes of inquiry according to summary sheet; relate to colored cards on board for later reference; watch ocean video and observe the variety of ocean organisms at the different levels |
| Assess (look for) | Silent reading and reference to card titles of inquiry modes to summary sheet; notes taken during video |
| **INVESTIGATION** | **INVENTION** |
| Mode(s) | Experimentation, Induction, Authoritative Knowledge, Technology | Mode(s) | Experimentation, Curiosity, Authoritative Knowledge, Induction |
| Teacher | Supervise students use of the scissors to open mystery boxes, and handling of unusual object; supervise students use of computer for research on their ocean creature | Teacher | Facilitate student question towards demonstration of the mode of inquiry for each activity; Observe students writing the “W” (what) they want to know about the ocean organism |
| Student | Volunteer students using scissors to open mystery boxes or take apart unusual object; research ocean organism using computer internet use  | Student | Make predictions and changes in their prediction as to what the unusual object is or what is in the mystery boxes; record “what” questions they want answered about the ocean creature they chose |
| Assess (look for) | Proper use of technology tools, record researched data on the “L” column of ocean creature | Assess (look for) | List of guess/prediction about the unusual object or mystery box contents, written questions on “what” students want to learn about their water organism |

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

Using the Phases of Inquiry diagram, refer to each phase as the instructor explains the parts of the day’s lesson.

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

The overarching modes of inquiry would be the experimentation, authoritative knowledge, curiosity, description and technology. Most of the time would be spent for students to talk and share their discoveries about the ocean creature they chose to research and share with the rest of the class.

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.