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

**Module 2: Chemical Aquatic Science**

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Activity: Properties of Water

1. Why did you choose to do this activity? This activity returns us to the basic knowledge of water and its properties. It is required for the TSI Mod. 2 unit and is an important lesson in my curriculum for my students

2. What are your classroom learning goals? Students will understand the terms cohesion and adhesion and how they relate to the behavior of water

3. How does this activity tie into your classroom learning goals? By investigating the properties of water students will think like scientists and be able to communicate their findings.

4. What date do you plan to start this activity? December 4, 2012

*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**

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| **Topic** | Nature of Matter |
| **Benchmark** [**SC.PS.6.8**](http://165.248.30.40/hcpsv3/imr/report_by_code.jsp?code=SC.PS.6.8) | Describe interactions among molecules |

**Ocean**

6. Describe how you will connect this activity to the ocean: Students will connect the concepts of adhesion and cohesion with ocean water and it’s chemistry.

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.) We will do the Concept Map Activity to learn the terms for compounds and molecules. I will give information about hydrogen bonds and the characteristics of water in three phases.

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.) Students will have a difficult time incorporating the new vocabulary into explaining their observations. I will remind them of the definitions and examples. Students will have a struggle understanding hydrogen bonding. I will reinforce the importance of learning new concepts even though we can’t see them directly, we can see evidence of them.

**Questioning and Assessment Strategies**

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

I will question the whole class about what they observe about water and it’s properties. I will question in small group to use the terms cohesion and adhesion as they investigate the properties of water

11. What *assessment strategies* will you use to help your students meet your learning goals and monitor their progress? Students will be responsible for recording their observations, responding to the Hypothesis prompts and Activity questions. Students will answer the Question Set: Water Properties

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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) | Description, Transitive Knowledge | Mode(s) | Curiosity |
| Teacher | Encourage students to answer the Question Set: Water Properties | Teacher | Question class about properties of water. “Why does Ice Float?” |
| Student | Through small group discussion will individually answer the Question Set: Water Properties | Student | Students will discuss prior knowledge and access authoritative knowledge |
| Assess (look for) | Understanding of the terms cohesion and adhesion | Assess (look for) | Comprehension of the properties of water in three phases |
| **INSTRUCTION** | | | |
| Mode(s) | Curiosity, Description, Experimentation, Deduction | | |
| Teacher | I will give students example and definitions of the terms cohesion and adhesion | | |
| Student | Students will incorporate these terms in their investigation | | |
| Assess (look for) | Student understanding of these terms before they begin investigation | | |
| **INVESTIGATION** | | **INVENTION** | |
| Mode(s) | Experimntation | Mode(s) | Curiosity, authoritative knowledge |
| Teacher | Monitor student activities | Teacher | Students will be given the materials to carry out the investigations. I will read the instructions and they will also have copies of the procedures to carry out the investigation |
| Student | Carry out activities as described in the TSI lesson | Student | Students will make predictions about their scientific investigation on the properties of water. |
| Assess (look for) | Students to make careful, deliberate observations and recording of observations | Assess (look for) | Students reluctance to make predictions for “fear” of being wrong. |

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

The Phases of Inquiry diagram will be posted. I will review the process with students

13. What will be the *overarching* mode(s) of this activity? Why? Students will spend most time in Investigation and Interpretation because they will be following the procedures set in the lesson. They do not have to design an experiment but they will create hypothesis or predictions. They will be investigating Parts A – E of the procedures.

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. The Activity on Matter Concept map will be done before this activity to teach the some chemistry basics.