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

**Module 2: Chemical Aquatic Science**

Name: *Dan VanRavenswaay*

Activity: *Properties of Water*

1. Why did you choose to do this activity?

 *a. It fits in with my marine science curriculum*

 *b. This is a required TSI activity.*

2. What are your classroom learning goals?

 *Students will use inquiry methods (modes) to build their own understanding*

 *of natural phenomena.*

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

 *It is hands-on inquiry, with guided observation and reflection along the way.*

4. What date do you plan to start this activity? *Friday, November 16, 2012.*

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

**Ocean**

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

 *Adhesion and cohesion of water have ramifications to marine organisms.*

 *Petroleum oils (and possibly other pollutants) has effects on things like the*

 *hydrophobic coatings on bird feathers.*

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.

X 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 started learning the new chemistry vocabulary and the simple atomic model.*

 *Most of the (9th grade) students remember some of this from their middle-school*

 *science experience.*

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’ll be working hard to help my students get predictions and observations on*

 *paper and in wording that makes sense to them when we reflect.*

**Questioning and Assessment Strategies**

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

 *I will be constantly moving between groups asking them to describe what they’re*

 *doing and what they are observing. We will wrap up each of the sections of this*

 *lesson with group reflection/discussion. I’ll ask them to summarize what they’ve*

 *observed.*

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

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 *doing and what they are observing. We will wrap up each of the sections of this*

 *lesson with group reflection/discussion. I’ll ask them to summarize what they’ve*

 *observed.*

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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 | Ask students to share a summary of what they observed, and how this relates to adhesion & cohesion. | Teacher | Have room set up in an interesting way with supplies ready to use.  |
| Student | Students share observations with the class.  | Student |  |
| Assess (look for) | Involvement and a growing understanding of the concepts in the lesson.  | Assess (look for) |  |
| **INSTRUCTION** |
| Mode(s) | Description, Authoritative knowledge |
| Teacher | Introduce the terms adhesion and cohesion. Give notes on these terms.Give instruction for the activities.  |
| Student | Takes notes on adhesion and cohesion.  |
| Assess (look for) | Students are taking notes and asking for clarification, etc., as needed.  |
| **INVESTIGATION** | **INVENTION** |
| Mode(s) | Curiosity. Experimentation, Replication | Mode(s) |  |
| Teacher | Oversee student experimentation. | Teacher |  |
| Student | Make predictions, do the activities, make and record their observations. | Student |  |
| Assess (look for) | Safety. Following steps that will lead to the observable properties.  | Assess (look for) |  |

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

*Initiations, Instruction (directions), Investigation, Interpretation*

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

*Experimentation and deduction. The students are making the observations themselves, and being asked to relate/connect them to newly learned concepts (cohesion and adhesion of water molecules.)*

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 have very small classes. I also have many students who, because of working memory or slow processing speed, must be given instructions one at a time. I’ll be spreading this activity out however long it takes to complete it. I expect it to take the better part of two days, even without the capillary tube activity (that I’ll do after the next Wednesday afterschool session).*