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

**Module 1: Physical Aquatic Science**

Name: *Justin Yamagata*

Activity: *Soda and the Ocean?*

Why did you choose to do this activity?

*It was a better fit with what was already done in my class (density). The other option was the moon’s phases demonstration which I am hoping to save until my unit on the Moon comes up around December.*

What are your classroom learning goals?

1. *To have students acting as scientists*
2. *Students gain a better grasp of what variables can affect density*
3. *Make the connection between what we do in class to the real world.*

How does this activity tie into your classroom learning goals?

1. *It allows students to use their scientific skill sets: questioning, generating hypotheses, testing, gathering data, measurements, and drawing conclusions.*
2. *Discussions about what variables affected density and how the activity is connected back to the ocean.*

What date do you plan to start this activity?

*10/17/12*

*If applicable:* HIDOE standards this lesson will address

*8.1.2 - Communicate the significant components of the experimental design and results of a scientific investigation*

**Ocean**

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

*After the activity is done, I will pose the question about how the activity can be connected back to the ocean. Using the variables they chose, I am hoping that they will see that the ingredients in the soda is a major factor in determining its density. The analog I’m hoping the students get is that the ocean has chemicals (ingredients) that affect the density of the water which then gives rise to movement of water (currents), and eventually impacts life in and around the oceans (and also impacting weather/climate).*

1. 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

□ 7. The ocean is largely unexplored

**Preparation**

1. How will you prepare your students for this activity? (For example, review of prior knowledge.)

*Since I have already covered density at the beginning of the year, I will give the students very little preparation. The only thing I will be telling them is that I will be expecting them to be acting as scientists do. With that, I’ll have them brainstorm and discuss amongst themselves what they think scientists should do, then we’ll come to some agreements as a class as to what is expected, and finally allow them to explore the activity. One other way I am planning on prepping the students is through the title, “Soda and the ocean?” By seeing this title, the students will already inadvertently be thinking about how the activity is connected back to the oceans.*

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.)

*One of my main concerns is the classroom discussion. Leading good discussions is one of my weakest skills as a teacher. I think by framing the discussion in the right way, I may be able to elicit the types of responses I’m looking for. For example, just by titling the activity, “Soda and the ocean?”, I hope the students will begin to digest that question and, inexplicitly, will begin to think of how the ocean and soda relate to one another. This way, by the time we begin the discussion, the students will already have had a chance to think about what is going on and will be more likely to take part in the classroom discussions.*

1. Select the TSI Mode(s) of Inquiry that you will focus on for this activity. (check all that apply)

X Curiosity

X Description

□ Authoritative knowledge

X Experimentation

□ Product evaluation

□ Technology

□ Replication

□ Induction

X Deduction

□ Transitive Knowledge

**Questioning and Assessment Strategies**

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

*Keep the role of information deliverer to a minimum and change the questioning from memory to thinking. Question to bring out the naturally occurring curiosity and wealth of knowledge each student already brings with them.*

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

*Peer share, informal lab report, lab summary, and exit pass.*

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.

1. *Students were extremely engaged in the activity. I set up the beginning of class similar to what was stated in the teacher guide except that I had one Coke and one Diet Coke in the container of water as the students came into class. Without saying a word, the students were drawn to it and began thinking, questioning, or just plain exclaiming about what was happening.*
2. *The only complaint I have would be in the procedure where students had to switch back and forth between Tables 1.1 and 1.2. It got a little confusing for the students and seemed almost unnecessary.*