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

**Module 1: Physical Aquatic Science**

Name: **Andy Laskowsky**

Activity: **Density Bags**

Why did you choose to do this activity?

**I chose this activity because I felt that it was a natural progression with the Soda Lab and that it would continue with my idea of having a 'teaser' lesson to spark interest in the thermohaline current, density, and ocean circulation. I chose to do it this way because I'm wrapping up a unit on the features of the ocean, and the project I currently use doesn't have 'currents' in it.**

What are your classroom learning goals?

**My classroom goals are for my students to gain a better understanding of the inquiry/research process. I also try and stress the ethics of science. I want my students to appreciate that just because there's an experiment that can be done, doesn't necessarily mean it *should* be done. I want my students to understand that scientific discoveries have a HUGE impact on history, politics, society, the economy, and the environment.**

How does this activity tie into your classroom learning goals?

**My goals for this activity were to teach density and currents while also reinforcing the science inquiry process. This lesson did both. This activity allows for students to followed a structured pattern in the beginning, and then use it as a model to develop two new experiments to gain a fuller understanding of the relationships between mass and volume in density.**

What date do you plan to start this activity?

**10/9-10/12**

*If applicable:* HIDOE standards this lesson will address

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| Benchmark [SC.8.1.1](http://165.248.30.40/hcpsv3/imr/report_by_code.jsp?code=SC.8.1.1) | | Determine the link(s) between evidence and the conclusion(s) of an investigation | |

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| Benchmark [SC.8.1.2](http://165.248.30.40/hcpsv3/imr/report_by_code.jsp?code=SC.8.1.2) | | Communicate the significant components of the experimental design and results of a scientific investigation | |

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| Benchmark [SC.8.2.2](http://165.248.30.40/hcpsv3/imr/report_by_code.jsp?code=SC.8.2.2) | | Describe how scale and mathematical models can be used to support and explain scientific data | |

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| Benchmark [SC.8.8.6](http://165.248.30.40/hcpsv3/imr/report_by_code.jsp?code=SC.8.8.6) | | Explain the relationship between density and convection currents in the ocean and atmosphere | |

**Ocean**

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

I will use this activity to intro a unit on currents, thermohaline circulation, and climate.

1. 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.

X3. The ocean is a major influence on weather and climate.

X 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.)

I will review the Soda Lab we did before break. The soda lab is a great intro to density, and really provided a very specific and concrete example to address how mass affects density.

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.)

I think that students will have a problem understanding that temperature can affect the volume of an object. I will use examples (pictures of railroad tracks bent by heat; the cracks in the sidewalk to let the slabs expand from heat) to help them visualize the idea. Then, I will use a few pennies in drawing to show conceptually what's going on.

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

x Curiosity

 Description

 Authoritative knowledge

x Experimentation

x Product evaluation

 Technology

x Replication

x Induction

x Deduction

x Transitive Knowledge

**Questioning and Assessment Strategies**

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

I try and use the Socratic method as much as possible in my class. So, when a student asks me a question, I'll ask them the same question. Something like “why do you think that?” Or, “Is there anything else you need to consider?” Or, “what do you know already?” Or (my personal favorite) “What do you think?”. Also, I won't tell the kids what to do. I'll let them develop the plans, and provide guidance if they're stuck.

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

Every day, I want my students to write a summary about the activity we did. Since this will probably take 3 days, I want to make sure that they will be able to pull everything together. We will review the summaries at the start of class on the following day and discuss what the next step might be, based on the soda lab from before.

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.