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

**Module 1: Physical Aquatic Science**

**Name: Nichole Montague**

**Activity: Density Bags**

**Why did you choose to do this activity?**

Because it was mandatory and with my time constraints (due to a student teacher) I needed to complete this lesson first prior to her solo time.

**What are your classroom learning goals?**

Scientific Inquiry – learning to create a testable hypothesis that can be answered through a controlled experiment and using appropriate tools, equipment, and techniques safely to collect, display and analyze data. Also introduce some lab equipment – beakers, hot plates.

Nature of Matter – Describe and compare physical properties of different substances – introduce/discuss/explore the idea of relative density related to salinity and temperature.

**How does this activity tie into your classroom learning goals?**

This activity will give students an opportunity to make a prediction/hypothesis that they can answer through a controlled experiment and learn how to collect their results in a chart to keep the data organized.

Students will get an opportunity to interact with some of the basic lab equipment – beakers, hot plates.

Students will learn about density as a physical property of water. They will understand how differences in temperature and salinity can affect density and compare the physical properties of different types of water.

**What date do you plan to start this activity? Friday 9/14/12**

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

Scientific Inquiry 6.1.1 & 6.1.2 – learning to create a testable hypothesis that can be answered through a controlled experiment and using appropriate tools, equipment, and techniques safely to collect, display and analyze data. Also introduce some lab equipment – beakers, hot plates.

Nature of Matter 6.6.6 – Describe and compare physical properties of different substances – introduce/discuss/explore the idea of relative density related to salinity and temperature.

**Ocean**

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

Has anyone ever experienced coming across patches/areas of water of different temperatures?

Why do different places in the ocean have different temperature layers?

What happens to areas where streams empty into the ocean?

How does differences in density affect the ocean?

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.

□ 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.)

Introduce water and oil and blue liquid with clear liquid to talk about why there are different layers of liquids.

KWL – density. What do we know about density? Discuss Density comparisons – bowling ball vs. volleyball. Density cubes – explore cubes of different densities.

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

√ Curiosity

□ Description

□ Authoritative knowledge

√ Experimentation

□ Product evaluation

□ Technology

□ Replication

□ Induction

□ Deduction

□ Transitive Knowledge

**Questioning and Assessment Strategies**

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

* probin g questions – prior knowledge/experience
* predictions – for lab
* oral questioning of whole group and individuals
* followup questions - written

1. What *assessment strategies* will you use to help your students meet your learning goals and monitor their progress?
   * Exit card strategy – questions on density and main concepts of lab
   * Follow up activity questions - written

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 introduced the concept of density with layering of different liquids. We also talked about how the ocean is layered by density. I showed students density blocks so they could see and feel what different densitites feel like. We also explored what would happen with blocks of different densities in water – some sink or float. Discussed salinity and made predictions about what they think salt would do to the density of water and told them they would be finding out in their lab experiments. Explained that first experiment would explore the effects of salt and described how to set up and make predictions. Following the first activity, we discussed and charted their results and talked in groups to make generalizations about the effects of salt on the density of water. (for each exp.) Students created their final experiment with any type/temp of water. Finally, we completed questions together as groups and discussed as whole class.