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

**Module 1: Physical Aquatic Science**

Name: Dan Spitler

Activity: Soda and Scientific Reasoning

Why did you choose to do this activity?

*My sixth grade students have not had a lot of experience with real experiments and using the scientific process and/or scientific reasoning. This seemed like the logical next lesson for them. We have worked on developing an understanding of mass, volume and density and this will add the concept of buoyancy to their understanding.*

What are your classroom learning goals?

*In science, that my students start looking at the world differently – at present, they are very passive and do not really push themselves intellectually or scientifically. I would like to get them to start looking at the world through a different lens, in a more questioning and aggressive manner. I want them to take control of their own learning.*

How does this activity tie into your classroom learning goals?

*We have worked on developing an understanding of mass, volume and density and this will add the concept of buoyancy to their understanding. Until they get a better grasp of how things behave and interact physically, they will still only have a rudimentary of the world through a scientific lens.*

What date do you plan to start this activity? *October 12, 2012*

*If applicable:* HIDOE standards this lesson will address

**Standard 1: The Scientific Process: SCIENTIFIC INVESTIGATION: Discover, invent, and investigate using the skills necessary to engage in the scientific process**

**Standard 6: Physical, Earth, and Space Sciences: NATURE OF MATTER AND ENERGY: Understand the nature of matter and energy, forms of energy (including waves) and energy transformations, and their significance in understanding the structure of the universe**

**Ocean**

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

*Anticipatory Set or Do Now – Imagine you are at the beach and your friends are throwing rocks, sticks and other things into the ocean. Some of them float and some sink. What causes some of the objects to float and some to sink?*

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.)

*Previous lessons and experiments exploring mass, volume and density will help them to have a better understanding of the principles and concepts explored in this lesson.*

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.)

*Most of my students are still at the “light and heavy” level of thinking, as well as having the misconception that small things are less dense than larger things when thinking about relative densities and buoyancy.*

*My students are struggling with following and especially developing procedures for experiments, as well as recording detailed observations.*

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

x Replication

□ Induction

□ Deduction

□ Transitive Knowledge

**Questioning and Assessment Strategies**

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

*Open-ended questions that will make them go back to the procedures for the lab and insure they are following them.*

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

*Observations and questioning methods that will provide formative assessment during the lab to modify instruction for present and future activities.*

*Lab write up as a summative assessment.*

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.