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

**Module 1: Physical Aquatic Science**

Name: Joanna Lee

Activity: Density Bags

Why did you choose to do this activity?

Density of ocean water could be tied in with organisms living in the different ocean zones in the 7th grade life science curriculum.

What are your classroom learning goals?

Ultimately, the goal is to cover the 7th grade life science standards, then to develop the students’ interest into becoming lifelong learners with a curiosity to learn about the world around them using an investigative, problem solving strategy. I would also like to see the student evolve through maturation in working independently so they are self-reliant while able to get along with others who are different from themselves. To accomplish this, the class is taught using differentiation so all students get varied modes of instruction so all can succeed. I use standardized grading so students learn to turn in quality work the first time and learn to revise work that is does not meet their/parents’ standard.

How does this activity tie into your classroom learning goals?

Students were able see what organisms in the ocean live at different ocean zones with a short video. Each zone has different densities which allow them to live at somewhat extreme temperatures, water pressure and salinity levels. During the investigation phase, one group of students worked together to try to subsurface the liquid bags in the cup of water but failed.

Discussion involved an exchange of ideas, then further experimentation. The teacher became a facilitator who asked questions to further their interaction with each other. Students were able to work with each other, share ideas and solve problems on their own through experimentation and exploration.

What date do you plan to start this activity?

Thursday, November 23, 2012 and a review/follow up lesson on Wednesday, October 31, 2012.

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

|  |  |
| --- | --- |
| **Benchmark** [**SC.7.1.1**](http://165.248.30.40/hcpsv3/imr/report_by_code.jsp?code=SC.7.1.1) | Design and safely conduct a scientific investigation to answer a question or test a hypothesis |
| **Benchmark** [**SC.7.1.3**](http://165.248.30.40/hcpsv3/imr/report_by_code.jsp?code=SC.7.1.3) | Explain the need to revise conclusions and explanations based on new scientific evidence |

**Ocean**

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

Mountain and stream water from the valleys flow to the Ala Wai Canal are fed past Washington Middle School. To tie in this activity to the ocean, an overview of how fresh water from the Ala Wai Canal meets and mixes with salty water at the mouth of the canal near Ala Moana. If there was time, then additional reference and further background would be needed for students to understand how the ocean currents, tides and waves affect the organisms that live at the different zones.

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.

X 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.

X 4. The ocean makes earth habitable

X 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.) Show students two videos (Ocean Motion and Ocean Zones)

Review the video questions and answers, have student take notes and review the vocabulary relating to the ocean with emphasis on 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.) One challenge was to introduce density as an ocean topic and relate it to the life science curriculum. More background information such as definitions, calculations and impact on ocean organisms had to be covered. Limited class time and the average to lower academic levels of students were also challenges. Students in 7th grade also need more processing time to understand the concept so additional time to repeat the material would have been helpful for clearer understanding by students.

One or two lab tables were able to experiment with different ways to subsurface the liquid bag but failed.

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

□ Product evaluation

□ Technology

X Replication

X Induction

X Deduction

□ Transitive Knowledge

***Questioning and Assessment Strategies***

1. *What questioning strategies will you use to help your students meet your learning goals*? If time were available, I would have created case study scenarios of organisms living at different ocean zones and ask how density of ocean water would impact their survival or ecosystems. Asking more questions to stimulate how density of ocean water affects organisms so they see the connection of the lab experiment to the concept covered**.**
2. *What assessment strategies will you use to help your students meet your learning goals and monitor their progress? More formative assessment during* the lesson to see how much of the density concept was understood before going on with the lesson could have been done. Student group assessment could have been done at the end if time was available.

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.