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

**Module 4: Ecological Aquatic Science**

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Activity: Sampling for Abundance

1. Why did you choose to do this activity?

This is a mandatory activity and meets the requirements for HCPS life science grade 7/8.

2. What are your classroom learning goals?

Students will

* apply transitive knowledge of collecting, organizing, and analyzing data, which they learned from math last year
* write a reflection on how sampling is used in real life

3. How does this activity tie into your classroom learning goals?

This activity provides opportunities for students to collect, organize data, and analyze data. Students will be able to recognize that sampling is utilized by scientists.

4. What date do you plan to start this activity?

April 11, 2013

5. *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 3: Life and Environmental Sciences: ORGANISMS AND THE ENVIRONMENT: Understand the unity, diversity, and interrelationships of organisms, including their relationship to cycles of matter and energy in the environment

6. Describe how this activity relates to at least one of the TSIA PD Themes.

Themes: Community, Metacognition, Science as a Human Endeavor, Observations and Inference, Modeling Science, Scientific Language, Connections

This activity provides opportunities for students to engage in learning science as an inquiry in relation to the following TSIA PD Themes.

Metacognition

Students will be able to:

* exhibit demeanors of scientists by writing a reflection about the activity – how scientists use sampling for abundance of living organisms in a simulated tidepool.
* fulfill expectations and performance criteria for the activity

Communication

* participate in a classroom community where all students are contributing to civil discourse about the scientific process, including communicating and defending evidence and conclusions.

Students will write a reflection of the use and purposes of sampling living organisms in a tide pool

* model the communication of both process and outcomes.

(Student reflection)

**Ocean**

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

I will explain to students that the blue tarp is a simulation of a tide pool. The will be required to record a sample of the population of living organisms in the tide pool.

8. 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.

x 4. The ocean makes earth habitable

x 5. The ocean supports a great diversity of life and ecosystems.

x 6. The ocean and humans are inextricably interconnected

x 7. The ocean is largely unexplored

**Preparation**

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

I shall provide an introduction to the activity and review of sampling by using the information about sampling in the module activity.

10. 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 anticipate students to have some difficulty about sampling (the processes – data collection and analysis) and the applications of sampling. Also, since the activity will be outside, I foresee a few students to not be engaged since I will not be able to closely monitor the class as oppose to an enclosed classroom.

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

What types of questioning or approaches to discussion will you take to support student

engagement and learning? See questioning handout for suggestions (Mod 3 Binder under “TSI Pedagogy and online in Mod 3 PD section)

I will use the following questioning strategies: clarifying, focusing, lifting, and leading questions.

12. What ***TSI practices of inquiry teaching strategies*** will you focus on implementing to help your students meet your learning goals?

See TSI Practices of Inquiry teaching strategies handout for suggestions (Mod 4 Binder under “TSI Pedagogy” and online in Mod 4 PD section)

Teaching strategies I will use:

* Provide time for
	+ cognitive discourse,
	+ reviewing and revisiting concepts,
	+ and multiple opportunities to practice.
* Develop student interest and make knowledge relevant through use of place and everyday situations, interests and life experiences, and societal or personal concerns.

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| Use the following table to plan your lesson using TSI. For each phase:* **Teacher:** Describe what you will be doing
* **Student:** Describe what your students will be doing
* **Assess:** Describe how you will assess your students in this phase so you can monitor their progress through the activity
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| **INTERPRETATION** | **INITIATION** |
| Teacher | Asking questions; Then, walking around | Teacher | Review prior knowledge about sampling |
| Student | Answering activity questions; asking questions | Student | Listening; answering questions |
| Assess  | Answers to activity questions | Assess  | Students’ answers to quesitons |
| **INSTRUCTION** |
| Teacher | Going over new terms and information from TSI Mod 4Checking for understanding |
| Student | Listening; following along with activity instructions. |
| Assess  | Students listening attentively; checking for understanding |
| **INVESTIGATION** | **INVENTION** |
| Teacher | Walking around; answering questions/prompting students to solve problems encountered; observing | Teacher | Walking around; answering questions/prompting students to solve problems encountered; observing |
| Student | Taking samples | Student | Asking questions; finding solutions |
| Assess | Chart | Assess | Student performance |

11. Briefly describe how you will guide your students through the TSI Phases of Inquiry. (You are the research director of your classroom, and thus guide or facilitate the learning in your classroom, even if an activity is very student-directed).

I shall first review the different phases. As we go through the activity, from introduction to analyzing data, I shall ask students what phase are we in.

12. What *overarching* TSI mode(s) will you focus on for this activity? Why?

Modes: Curiosity, Description, Authoritative knowledge, Experimentation, Product evaluation, Technology, Replication, Induction, Deduction, Transitive knowledge

The overarching TSI modes I will focus on will be: curiosity, experimentation, product evaluation, and transitive knowledge. Students have learned some type of sampling in their math and English language arts classes. Some students have not had the opportunity to visit a tide pool nor are most of them familiar with living organisms in a tide pool. Engagement in experimentation will be demonstrated as they perform the activity. Students will reflect on the activity and the use of different representations of living organisms.

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.