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

**Module 3: Biological Aquatic Science**

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Activity: Fish Form and Function

1. Why did you choose to do this activity?

We are going on a 3 day/2 night camp at Waipa on the North Shore of Kaua’i. We will be fishing , and it would be great to use the fish my students catch to complete this lesson.

2. What are your classroom learning goals?

Students have the opportunity in this lesson to study the anatomy of fish and the differences among species.

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

This lesson is a great way for my students to enjoy studying fish. Incorporating creativity and art in science is an excellent way for them to learn.

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

Any time during our camp experience from 2/13-2/15/13

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

SC5.3.2 Interdependence

**Ocean**

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

We will connect this activity to the ocean easily as we are camping a few steps from the ocean. We plan to net fresh fish and use them to paint and print. We will discuss how we hope to catch several different species of fish.

7. 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

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**

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

I will ask what they know about different fish species, names, habitats, etc. Also I will ask if they are able to name any of the parts of a fish.

9. 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 do not anticipate any struggles. I think my students will be engaged and enjoy the lesson.

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

What do you observe about each fish you print-anatomy. Why do you think the fish evolved this way (predation, habitat, defense, etc.).

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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 | Will ask questions about how successful the printing went for students. What can you conclude about the fish and where it lives based on the print. | Teacher | Will describe the printing process to students and raise their curiosity and excitement in the lesson plan. Teacher will discuss anatomy of the fish and request that students paint to show the parts of the fish. |
| Student | Student will observe what fish printed well. Did the amount of paint or color make any difference in the printing. Students will observe prints and answer teacher questions to make conclusions. | Student | Student will listen to printing techniques and begin experimenting with paint and paper. Students will choose a fish to print. |
| Assess  | Printings will be collected and assessed. Teacher will assess student understandings by monitoring answers to TSI questioning strategies. | Assess  | Teacher will check for understanding about how to successfully print the fish and show the parts of the fish in the print. |
| **INSTRUCTION** |
| Teacher | Will demonstrate how to paint and print a fish using various amounts of paint. Teacher will use TSI questioning strategies during the lesson to guide students. |
| Student | Students will listen to and answer questions posed by teacher. Students will ask for guidance if needed on how to print the fish. Students will ask for clarification(s) on fish anatomy. |
| Assess  | Teacher will assess answers to questions during the lesson. Teacher will observe that students are following the directions to achieve successful prints.  |
| **INVESTIGATION** | **INVENTION** |
| Teacher | Teacher will lead by modeling fish printing and guide students through the actual process. | Teacher | Will ask questions while students are painting about how/why two prints look different. Teacher will ask for other ideas of how to create prints of fish. |
| Student | Students will paint fish and experiment with different species, colors, and paint amounts. | Student | Students will try out different ideas to see how different prints turn out. |
| Assess | Teacher will observe that students are noticing differences in fish prints and differences in fish anatomies. | Assess | Teacher will assess students by observing how they try to implement the ideas they create to change how prints look based on paints and rearranging the anatomy of a fish. |

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 expect to begin in Initiation and follow the students’ leads as they begin choosing a fish and start painting. We will return to Instruction throughout the lesson when I use the questioning strategies. I also expect to flow in and out of Investigation and Interpretation as students choose various fish species and print them. We will be doing this as an entire class so students will be moving from phase to phase each on his/her own as they paint and observe and answer questions.

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

Product Evaluation: Students will try printing with real and rubber fish. They will compare the differences in the prints.

Technology: Students will try different colors, mixes of colors, and amounts of paint to create different effects in the printing process.

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.

After a brief demo, I plan to just let the students go with it. The phases will alter throughout the lesson depending on what each student is doing at a certain time.