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

**Module 2: Chemical Aquatic Science**

**Name: Nichole Montague**

**Activity: Fish Printing for Form and Function**

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

I chose to do this activity because it was the most interesting out of the choice activities for me. We have a very limited life science component to 6th grade, so I chose the one that incorporated art as well as I am required to teach art and I love integrating it in science.

**2. What are your classroom learning goals?**

My classroom learning goals are:

Students must work together as a team.

Students need to experiment with different procedures to find out what works best for their group.

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

This activity ties into my classroom learning goals because students will be required to work together in teams to paint their fish and produce individual fish prints.

Students must also work together to figure out the most effective procedures to make a nice fish print.

**4. What date do you plan to start this activity?** Tuesday 1/5/13

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

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**Ocean**

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

I will connect this activity to the ocean by asking how many students fish or have family members that go fishing. I will ask what they know about different types of fish living in the ocean.

**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.)**

This will be a fun activity. I have already showed the class my fish print after the workshop and explained that they would be making one as well. On the day of the lesson, we will talk about fish and what they know about fish. I will also ask about the variety of fish in the ocean and why they think there are so many different types. Then I will ask how scientists study fish and bring up gyotaku. I will show them examples and then follow the lab.

**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 think students might have difficulty with the techniques involved in making a good fish print. I can also foresee some difficulties with a limited amount of fish that students will have access to and having to work together and be extra patient.

**Questioning and Assessment Strategies**

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

Clarifying Questions

Extending Questions

Focusing Questions

Summarizing Questions

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

Group Discussion and Response

Individual student/team questions/discussions

Oral question feedback and written question feedback.

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| Use the following table to plan your lesson using TSI.  For each phase:   * **Mode(s):** List the Mode(s) of Inquiry you will incorporate * **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   \*Modes: Curiosity, Description, Authoritative knowledge, Experimentation, Product evaluation, Technology, Replication, Induction, Deduction, Transitive knowledge |

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| **INTERPRETATION** | | **INITIATION** | |
| Mode(s) | Description | Mode(s) | Curiosity, Description |
| Teacher | Talk to individual groups and students about activity questions throughout lab as appropriate.  Discuss questions with whole class and get feedback from groups and individuals.  Field questions about anatomical parts of a fish. | Teacher | Teacher asks students how many have gone fishing…. Or family members that fish? Describe what a fish looks like. Ask how Scientists study fish?  Show pictures of gyotaku prints |
| Student | Orally reflect on their experience in their groups and to whole class.  Write personal individual answers to questions on their worksheet.  Ask questions. | Student | Students respond to teacher prompts and share experiences/descriptions with whole group. |
| Assess (look for) | Student understanding of techniques used and description of modifications used. | Assess (look for) | Experiences and ideas kids have about fish. |
| **INSTRUCTION** | | | |
| Mode(s) | Authoritative Knowledge | | |
| Teacher | Pass out Activity Procedure Worksheet. Review with whole class. Field questions on expectations and procedures. Divide class into groups of 4. | | |
| Student | Read along while we go over the procedure. Ask questions to clarify expectations or procedure. | | |
| Assess (look for) | Students paying attention as we review procedure.  Ask each table to report back any questions about expectations. | | |
| **INVESTIGATION** | | **INVENTION** | |
| Mode(s) | Experimentation, Replication | Mode(s) | Curiosity |
| Teacher | Monitor small groups while walking around the classroom. Ask questions of students to check for understanding or draw them into a better understanding.  Pass out paper towels and material as needed. | Teacher | Pass out equipment and fish to groups.  Walk around and monitor small groups as they work together to plan out their task. |
| Student | Paint their fish several times – each time improving on the methods/techniques used. Use paper towels and material to make their fish prints and hang them to dry. | Student | Students decide on fish. Students discuss colors they want to use and technique to display fish and fins/gills/etc. Students discuss technique to use when painting. |
| Assess (look for) | Students following directions. Good technique to get details of fish. An understanding of task. Articulation of how they improved their technique for painting and printing.  Cooperation between group members and taking turns. | Assess (look for) | Cooperation, understanding of task and good methods used to display fish prior to painting. |

**12. Briefly describe how you will direct your students through the Phases of Inquiry.**

I will initiate the lesson with questions about fishing in the ocean and any prior knowledge related to fish. I will also show examples of gyotaku to initiate interest in the lesson. Following that I will give instruction on the procedures students will follow throughout the activity. Students will then be allowed to invent their own methods to display and color their fish as I monitor group work and ask leading questions. I will then allow students to begin investigating with their painting and printing techniques as they progress through the lab. During this time students will be going into and out of the interpretation phase as I ask questions as I monitor groups. Finally students will spend time after cleanup in the interpretation phase where they will discuss answers to their questions and share with the class as well as write answers on their worksheets.

**13. What will be the *overarching* mode(s) of this activity? Why?**

The overarching mode of this activity will be experimentation because students will be allowed to experiment with different methods of displaying their fish and its parts as well as experiment with the painting and printing techniques as each member tries their own print.

**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 think it is useful to have more than 1 fish per 4 students. I would recommend 1 fish per 2 students if possible.