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

**Module 3: Biological Aquatic Science**

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Activity: Fish Printing for Form and Function

1. Why did you choose to do this activity?

I chose to do this activity with my class because we are introducing classification of fish, anatomy, and form and function at this time and I thought this would coincide well.

2. What are your classroom learning goals?

Learning goals are to familiarize students with the external anatomy of fish (form) and the function of the differing types of anatomy (fins, eye size, coloration, adaptations, etc.)

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

Printing fish will help familiarize students with form by naming/labeling all of the features of the fish.

4. What date do you plan to start this activity? 2/6/13

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

**SC.MS.5.1**-Structure and function: Explain how adaptations help animals survive in a marine environment

**SC.MS.5.2**-Structure and function: Compare the characteristics of marine organisms (e.g., planktonic, invertebrate, vertebrate)

**Ocean**

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

We will discuss how form relates to function and how function relates to habitat. This lesson will be part of a unit that will add depth to the student’s knowledge about this topic using The Living Ocean curriculum resources.

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.)

Students will learn about external fish anatomy and directional anatomical vocabulary with a class activity to prepare for this lesson. Because this is an initial lesson within the unit, their background knowledge may be limited. The fish printing activity is intended to be a “hook” to excite students about learning fish form and function.

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.)

Students may become excited to begin this activity without taking the time to carefully follow instructions. For this reason, I am planning on reading through the instructions with them prior to distributing any materials.

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

I am planning on using focusing questions with introduction of anatomy and clarifying questions when addressing how form relates to function.

Eventually I would like to use lifting questions to discuss adaptations.

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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 review the answers that students contribute to the end of activity questions. | Teacher | Shares authoritative knowledge about fish printing shows pictures, examples. Also shares examples of a teacher at school who fish prints for hobby. |
| Student | Can identify external anatomy of their fish as well as the function based upon the structure. | Student | Listens, asks questions, shares any related stories or experiences |
| Assess | For accuracy of response. | Assess | Active engagement in listening and discussion. |
| **INSTRUCTION** | | | |
| Teacher | Read through activity instructions with students, asks questions to check for student understanding. | | |
| Student | Reads aloud, asks any clarifying questions | | |
| Assess | Reading, listening, can answer clarifying questions from teacher | | |
| **INVESTIGATION** | | **INVENTION** | |
| Teacher | Monitors activity for proper implementation, answers any questions | Teacher | Materials are identified and distributed |
| Student | Engages in fish printing activity | Student | Uses product evaluation to determine what is needed to complete this activity |
| Assess | Anatomy is correctly identified, related questions are answered. | Assess | Student ability to identify and gather appropriate materials |

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 plan to begin with initiation by developing student interest, and then instruction with the directions for the activity. Students will then engage in the invention phase while determining what tools and fish they would like to use for the activity. This will lead naturally into invention, where students will be creating their fish prints and labeling for anatomy. Lastly, we will interpret with answering related questions. At this point more instruction and authoritative knowledge may cycle back to help clarify for student understanding.

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 modes will be product evaluation and experimentation. Students will be evaluating materials for use in fish printing as well as engaging in the experimental phase repeatedly with an opportunity to complete multiple prints.

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 have tried this activity in years past but struggled with my own personal inexperience and background knowledge. Additionally, the cost of purchasing fish became too great. Often, students will commit to bringing in fish for the activity but do not follow through. It will be helpful to have some rubber fishes as well as more background. In the past I had been too caught up in the perfection of the final product, when it is really the process and experience that make this activity so beneficial to students.