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

**Module 3: Biological Aquatic Science**

Name: Joanna Lee Activity: Fish Form and Function

1. Why did you choose to do this activity?

This activity is in line with my curriculum life science goals. In third quarter, students study genetics and organisms.

2. What are your classroom learning goals?

 Students should able to work in small groups to solve procedural issues in making a fish print as well as discuss the fish anatomy and features. Students should also evaluate their drawings and fish prints to other students’ work and assess quality work.

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

This lesson helps students understand the structure, reproductive system of organisms and genetics that are in line with the 7th grade life science standards. They will work individually and in small groups cooperatively.

4. What date do you plan to start this activity? February 11-14, 2013.

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

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| **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 |

**Benchmark SC 7.4.4 Classify organisms according to their degree of relatedness**

**Benchmark SC 7.5.4 Analyze how organisms’ body structures contribute to their ability to survive and reproduce**

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

The examples of organisms from the ocean were focused on as well as their environment. The ocean creatures’ adaptations and body structures were addressed on how it helped the organism survive living in its environment.

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

**X** 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 review the fish anatomy with powerpoints or worksheets to understand its adapted 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.)

Instructional struggles include time constraints and limited fish for whole class fish printing. As an incentive, groups who finish their prep worksheet and back work will be allowed to fish print first.

**Questioning and Assessment Strategies**

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

Focus: How does the fish you are printing use its features to swim?

Extend: What are other ways can you use in gyotaku fish printing to make a more detailed print?

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

The assessment will be completion of their worksheets, fish drawings and fish prints as well as observation and oral questioning on the printing process.

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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) | Induction, Deduction, Product Evaluation, Description | Mode(s) | Description, Curiosity, Product Evaluation, Authoritative Knowledge |
| Teacher | Allow students to compare their original drawings with their fish printAsk students what features were shown on the drawing that were not on their fish prints and why it appeared or did not appear | Teacher | Allow students to compare their drawing to their peers and then a drawing posted on blackboard and preprinted gyotaku printAllow students to revise their drawing to include more detailsShow powerpoint explaining fish anatomy and how its features help fish to swim  |
| Student | Compare their revised drawing to the fish printDiscuss the similarities and differences of features shown between fish prints | Student | Compare their drawing and share it with peersRevise and include more detail on their original fish drawing with its structure with labels and functionCompare its detail with the gyotaku print sample |
| Assess (look for) | Complete assessment sheet of activity questions, fish drawing and fish prints | Assess (look for) | Revision of detailed drawing of a typical fish with structures and functions identified |
| **INSTRUCTION** |
| Mode(s) | Curiosity, Description |
| Teacher | Tell students to draw a typical fish with the details they remember using a basic line shape of a fish |
| Student | Draw the details of a fish from memory and identify its parts/structures |
| Assess (look for) | Basic detail of a typical fish drawing with its parts/structures identified |
| **INVESTIGATION** | **INVENTION** |
| Mode(s) | Experimentation, authoritative knowledge, curiosity, induction, repetition | Mode(s) | Curiosity, induction  |
| Teacher | Observe and guide students during fish printingDistribute muslin if paper towel prints meet standard | Teacher | Give basic safety and hygienic instructions for fish printingAllow time for students to explain detailed procedures for better fish prints |
| Student | Print fish(gyotaku) on paper towel, then muslin fabric  | Student | Study fish sample of fish prints and create a procedure for detailed fish printing |
| Assess (look for) | Group work in cooperation, printing procedure and clean upObserved goal for quality printing and peer assistance | Assess (look for) | Partial completion sheet (in groups of two students) of procedures for fish printing |

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

The students will view the phases of inquiry chart as the teacher reviews the lesson on scientific language at the beginning and end of the lesson.

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

 The focus mode of this lesson is authoritative knowledge, curiosity experimentation and product evaluation. Students will listen for instruction on how to make fish prints (gyotaku), compare fish features and study its adapted function to live in its environment while discussing information with other students. They will also compare their fish prints with their drawings and other fish 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.