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

**Module 2: Chemical Aquatic Science**

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Activity: Phases and Modes of Scientific Practice

1. Why did you choose to do this activity?

This activity was chosen because it is a mandatory lesson in Module 2.

2. What are your classroom learning goals?

Students will complete sections A and C. In doing so, students will be exposed to the concept of metacognition and use this concept along with the phases and modes of

 TSI to review and describe their learning process during our Conductivity lesson.

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

This activity ties in to my classroom learning goals to discover, invent, and investigate using the skills necessary to engage in the scientific process.

1. What date do you plan to start this activity? 1/25/13
2. *. If applicable:* HIDOE standards this lesson will address

SC 5.1.2 The Scientific Process: Scientific Investigation

**Ocean**

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

We will review what we discussed about the ocean during the Conductivity lesson and apply that discussion to the modes and phases of inquiry.

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

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

 x 6. The ocean and humans are inextricably interconnected

 x7. The ocean is largely unexplored

**Preparation**

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

Handouts of the phases (Fig. 1.1) and modes (Table 1.2) will be provided. Terms and concepts will be discussed with examples from previous lessons applied.

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.)

 This lesson may prove to be difficult for my 5th graders. The concepts and how to apply them will require more discussion and guidance than past TSI lessons. For some of my students, this just may be a little too difficult to complete.

**Questioning and Assessment Strategies**

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

I will ask them to describe what they did and what they observed during the Conductivity experiment. I will ask them what reaction they felt or exhibited during the various steps they followed.

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

Students will work with the same partners they had during the Conductivity experiment. I will assess them by their discussions, and by the completion of the paperwork.

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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 | Mode(s) | Curiosity |
| Teacher | Facilitates groups sharing ideas about their metacognition during the Conductivity experimentFacilitates understanding of relationships between thoughts, communications, and actions to the phases and modes of inquiry | Teacher | Will cover the concepts and definitions of metacognition and the phases and modes of inquiry |
| Student | Shares understandings of the phases and modes and applies them to the steps taken during Conductivity experiment | Student | Will ask questions to clarify meanings of phases and modes; discuss their understanding of the concepts with other students |
| Assess (look for) | Data is recordedStudents are demonstrating increased comprehension during classroom discourse | Assess (look for) | Observe students and ask them to describe how they are using the phases and modes to explain their thinking |
| **INSTRUCTION** |
| Mode(s) | Authoritative Knowledge |
| Teacher | Provide introduction and questioning about metacognition and the phases and modes of inquiryUses lesson tables and figures to guide students’ understanding |
| Student | Review lesson table and figure to learn new terminology of the phases and modes |
| Assess (look for) | Students are following directions of lesson proceduresStudents are sharing information and successfully using the terminology |
| **INVESTIGATION** | **INVENTION** |
| Mode(s) | Description | Mode(s) | Deduction |
| Teacher | Provides information from lesson  | Teacher | Guides student understanding of terminology and how to apply it to the Conductivity lesson |
| Student | Records information on worksheets and in Science notebooks after discussion of conceptsAsks questions and seeks additional information | Student | Applies phases and modes following the sequence of events during the Conductivity lesson |
| Assess (look for) | Follows the directionsShares information/ideas with partnersSuccessfully completes lesson worksheets | Assess (look for) | Students are able to make connections between actions, thoughts and communications of Conductivity lesson to the phases and modes of inquiry |

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

This will all be new material for my students. I will begin the lesson with a discussion of the concepts. As they apply these concepts to their Conductivity lesson and fill out the worksheets for this lesson, I will ask them to describe how they are applying the phases and modes. I will also ask them to describe what they were thinking during the Conductivity experiment (what were there reactions to things that were happening at the time). I will also ask them to describe what they are thinking during this lesson.

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

Authoritative Knowledge, Description, Induction

Authoritative Knowledge: Students and teacher will be applying information directly from the tables and figures provided in the lesson (from the Module 2 binder) in order to successfully discuss, understand and apply the concepts of TSI.

Description: Students will recreate the Conductivity lesson through the lens of the TSI phases and modes while hopefully applying the concept of metacognition.

Induction: Students will generalize the relationships between actions, thoughts, and communications to the phases and modes of inquiry.

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 expect this lesson to be a bit difficult for my students. The terminology and its application to the Conductivity lesson will be a challenge for them. It may prove to be very difficult for a few of my students. I will guide and facilitate, but do not plan to hand-hold any students so some of the worksheets may not be completed.