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

**Module 2: Chemical Aquatic Science**

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Activity: Water Properties

1. Why did you choose to do this activity?

I chose this activity because I was impressed with how water behaved in our learning sessions and I wanted to share this learning with my students. Excitement is contagious therefore learning the small things can lead to bigger ideas. I chose this activity because I am going into the atom and the periodic table of elements. This activity connects will connect in that it shows the behavior of elements with each other and what can take place.

2. What are your classroom learning goals?

 My classroom learning goals are that students will learn the scientific method process through inquiry, and learn to use the tools safely and with skill when making quantitative observations, and to learn about the flow of matter. Students will become skilled in making observations, asking questions, look for answers, and then come to their own conclusions.

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

 This activity ties into my current classroom learning goals, by touching on the nature of matter, by having students formulate their hypothesis and engage in scientific inquiry by having students examine the properties of water.

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

I plan to start this activity following the conclusion of the density bag activity.

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

6.1.1 Scientific Inquiry – Formulate a testable hypothesis that can be answered through a controlled experiment

6.1.2 Use of appropriate tools safely

6.6.5 Explain how matter can change physical or chemical forms, but the total amount of matter remains constant.

6.6.6 Nature of matter – describing and comparing the physical and chemical properties

of different substances

6.7.1 How forces affect an object’s motion

6.6.8 Recognize changes that indicate a chemical reaction has taken place

**Ocean**

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

I can connect this activity to the ocean by asking students to think about this activity and how it connects to what they know about the ocean and how the ocean would behave in this activity. I can ask students to share their ideas with their peers and peers can share out to the class. As a reflection piece, students can create questions that they may want to investigate at home, and then bring their results into class.

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.

□ 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 prepare my students by asking them a question, such as, how many drops of water can you fit on the surface of a penny before it spills over? Then have students written the question in their notebooks and to answer the question, they create their predictions.

 Some students will have done this activity before and I will have them share what they have learned from their prior experience with the class. Then I will challenge them by saying that we are going to take their present knowledge and push it up.

After the first day I will begin the class with a warm up question that will encourage students to make predictions with their partners.

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.)

 The struggle I have is allowing time for students to explore this activity and still do science fair and now the atom and periodic table. It makes me feel scattered and therefore look scattered and behind in my pacing guide. I am learning how to look at a class needs over what is set in a pacing guide and making calls based on individual class dynamics. I encourage class feedback, questions, and discussions hoping to emphasize students understanding that their learning is their responsibility and we work together as a team, all students all teachers.

**Questioning and Assessment Strategies**

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

The questioning strategies I will use is usually the beginning of an activity as a do now or warm up and have peer partners discuss and predict then random share out. I use questions following chunks of information reviewed in class and students turn and share with their partners then share out. I ask questions then have students raise hands or thumbs up for answers then confirm their responses.

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

I will first have students create their own hypothesis and share then I will model how to improve their hypothesis by using the vocabulary. The next hypothesis will by their own now that they have an example to refer to. I will observe student behavior as they are working with materials and making measurements. I will have students conclude chunks with their ‘I learns’ in their notebook and use this written example of learning as their exit pass from class. I will have students read their partners work and score them based on the interactive notebook rubric we use in class. Each student will get an understanding on how they are progressing as we start each period.

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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) | Replication  | Mode(s) | Curiosity  |
| Teacher | * **Teacher:** will be having students record their final actual number of drops on the board. Guiding students to look at the numbers generated and remind them that we are analyzing the data. Asking students what do they observe in the data collected? What stands out in the data? What do they call the larger numbers? How do they find the range? How do they find the mean?
 | Teacher | * **Teacher:** I will be asking students the questions to start the curiosity in students
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| Student | * **Student:** will be writing their findings on the board. They will be comparing their predictions with the actual findings. They will be comparing the class data to analyze the results. They will be thinking about the data, finding and naming the outliers, range and mean of the numbers. They will write their analysis of the results before leaving class.
 | Student | * **Student:** will be curious, will be connecting to prior experiences, will be creating their predictions, and will be designing how they are going to do the task.
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| Assess (look for) | * **Assess:** I will read their analysis of their results of their data comparisons.
 | Assess (look for) | * **Assess:** I will be observing student conversations with partner
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| **INSTRUCTION** |
| Mode(s) | Description  |
| Teacher | * **Teacher:** will be asking students to share if they have done this activity before
* **Assess:** I will be listening and suggesting that we will start where you are and hint that there is more to learn
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| Student | * **Student:** will be sharing with their table partners their prior experiences and information
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| Assess (look for) | * **Assess:** I will be listening and suggesting that we will start where you are and hint that there is more to learn
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| **INVESTIGATION** | **INVENTION** |
| Mode(s) | Experimentation  | Mode(s) | experimentation |
| Teacher | * **Teacher:** will be assisting students in organizing materials
 | Teacher | * **Teacher:** will have students write their predictions in their notebook and have students write predictions on the board to make comparisons
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| Student | * **Student:** will be working in teams of four. Organizing each team members’ role in the group. Using the materials to drop and count the number of drops on a penny. They will record their best actual number of drops in their notebook and then on the board so we can make comparisons.
 | Student | * **Student:** will make prediction on how many drops they can put on a penny before they begin. Each part will begin this way.
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| Assess (look for) | * **Assess:** I will be observing student efforts at this task and if needed guide students with tips on keeping the penny dry and the area around the penny dry.
 | Assess (look for) | * **Assess:** student will report their predictions to each other.
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12. Briefly describe how you will direct your students through the Phases of Inquiry.

I will direct the students with questions and need to do’s, such as, you need to write down your final actual number of drops in your notebook and on the board so we can make comparisons and analyze data.

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

The overarching mode for this activity will be Experimentation, because students of learning once given the opportunity, enjoy experimenting. The students will want to better their number of drops on the penny so several trials will take place. They will find different surfaces to work on and try their very best to get the highest number of drops on a penny.

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.

To prepare for this activity, I will create a power point to help me organize the activity and have a visual assistant for the lesson. I will start with part A, first to get the students initial interest in the activity. I will then make a copy of the printed material beginning with Hydrogen Bonds and ending with page 10, to have students read the information on cohesion, adhesion, before going into part B and C and hopefully D. when it comes to part E, creating the tallest column of water, I might do it as a demo, have students make predictions and conclude the activity with their analysis and conclusion.