

Teaching Science as Inquiry (TSI) Lesson Plan

Module 1: Physical Aquatic Science

Name: Michelle Kay

Activity: Density Bags

Why did you choose to do this activity?

I truly enjoyed the "Density Bags" activity during our workshop, and I felt as though my students would enjoy it as much if not more than I did. I also wanted to do this activity with my students to help with their misconceptions about density and also to learn more about convection currents.

What are your classroom learning goals?

- For the students to understand how the mass and volume of an object affects the density of that object
- For the students to understand how salinity and temperature affects density
- For the students to learn that the earth has one big ocean
- For the students to explain convection currents in the ocean

How does this activity tie into your classroom learning goals?

The classroom learning goals include our 8th grade science standards.

What date do you plan to start this activity?

September 18, 20, and 21

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

Strand: Physical, Earth, and Space Sciences

Standard 8: Physical, Earth, and Space Sciences: EARTH AND SPACE SCIENCE:
Understand the Earth and its processes, the solar system, and the universe and its contents

SC.8.8.6: Forces that Shape the Earth: Explain the relationship between density and convection currents in the ocean and atmosphere

SC.8.8.7: Forces that Shape the Earth: Describe the physical characteristics of oceans

Ocean

1. Describe how you will connect this activity to the ocean:
I am going to center this activity around the ocean since our first activity will deal with salinity. As a class we will discuss the ocean's physical features, such as size, depth, currents.
2. 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

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

Day 1: Salinity

First, I will ask the students who have swam in the ocean, rivers/lakes, and pools. Then, I'll have the students discuss the differences between those three bodies of water and write them on their dry erase boards as a group. Will take a quick survey of who thinks it is easier to float in the ocean or pool (rivers/lakes).

I will also have them take notes and have small group discussions about density and the fruit lab they had done the year before. Discuss the misconception of big things sink and small things float.

Day 2: Temperature

First, the students will discuss what they learned the day before regarding salinity and density. Next, the students will discuss their prior knowledge of temperature and kinetic energy. Students will take notes.

Day 3: Salinity and Temperature

In small groups, students will discuss the prior days' labs and newly acquired knowledge. More notes will be taken for convection currents in the ocean.

2. 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 will have a difficult time understanding density and the relationship between mass and volume. I will remind the students about the fruit lab from the

year before and demonstrate that the grape will sink in water and the apple floats. Also, I will help students tap into their prior knowledge of convection currents, kinetic energy, and temperature from 6th grade science.

3. Select the TSI Mode(s) of Inquiry that you will focus on for this activity. (check all that apply)

- Curiosity
- Description
- Authoritative knowledge
- Experimentation
- Product evaluation
- Technology
- Replication
- Induction
- Deduction
- Transitive Knowledge

Questioning and Assessment Strategies

1. What questioning strategies will you use to help your students meet your learning goals? I will use questioning strategies to peak the students' curiosity about density and the relationship between salinity and temperature. I will also use questioning strategies to help the students with the interpretation phase with "what ifs".
2. What assessment strategies will you use to help your students meet your learning goals and monitor their progress? In my class, my students sit in small groups and I often have them discuss their ideas amongst each other, and then share out using small dry erase boards. I will do the same with this lesson. I will have the students share their thoughts, ideas, and predictions through dry erase boards. This will help me with assessing their understanding of the lesson and activity.

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.

My students have been using an interactive notebook for the first time this year, and I will have the students continue to use this as a tool for them to take notes and record their observations of the activities.

TSI Lesson Reflection – TSI Phase Diagram

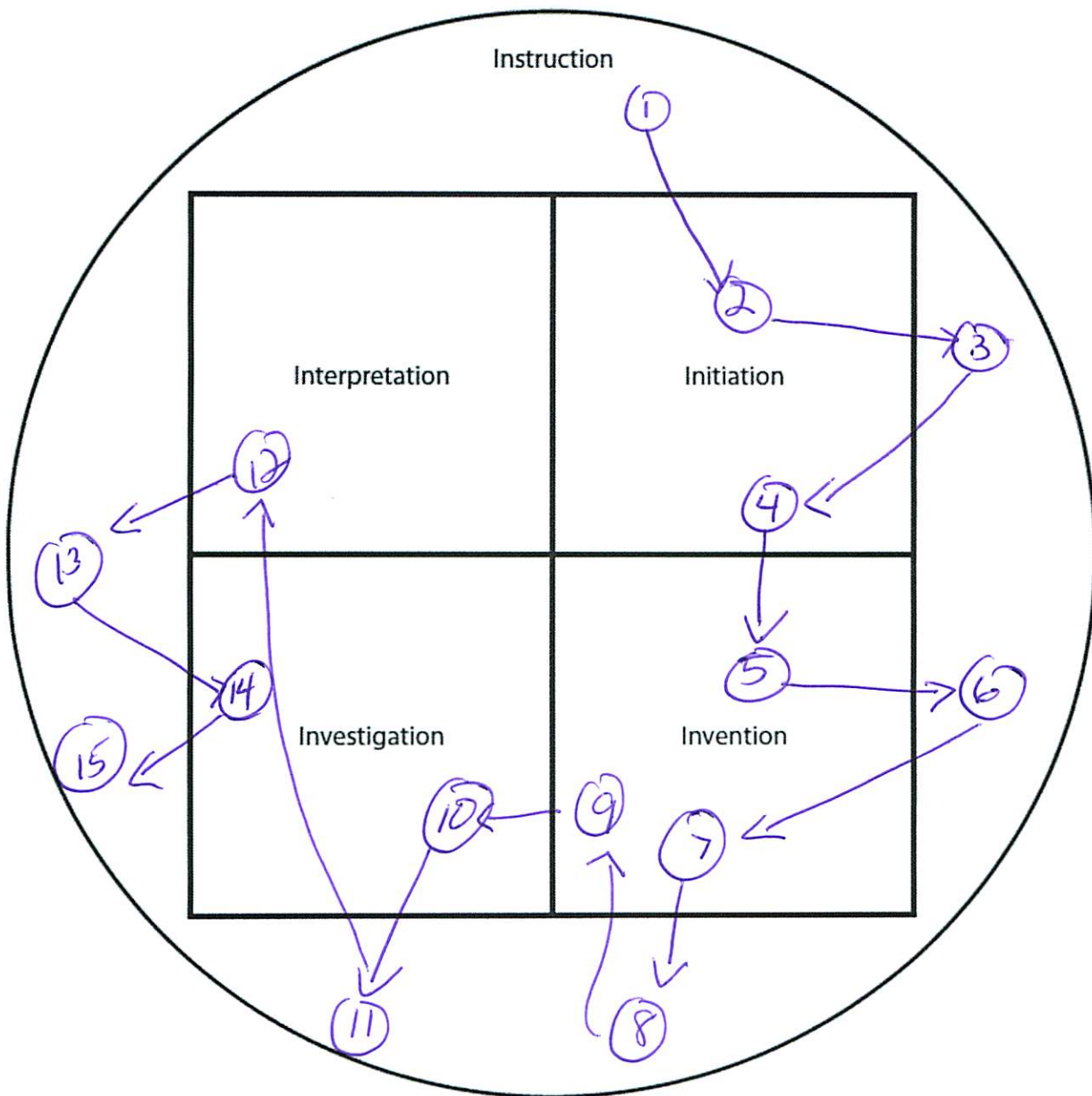
Name: Michelle Kay

Activity: Density Bags Day 1

What level did you observe? Individual Pair Small group Full Class

Why did you observe this level? I wanted to see how my entire class went through the TSI Phases.

Draw arrows indicating your progression through the TSI Phases of Inquiry. Number your arrows.



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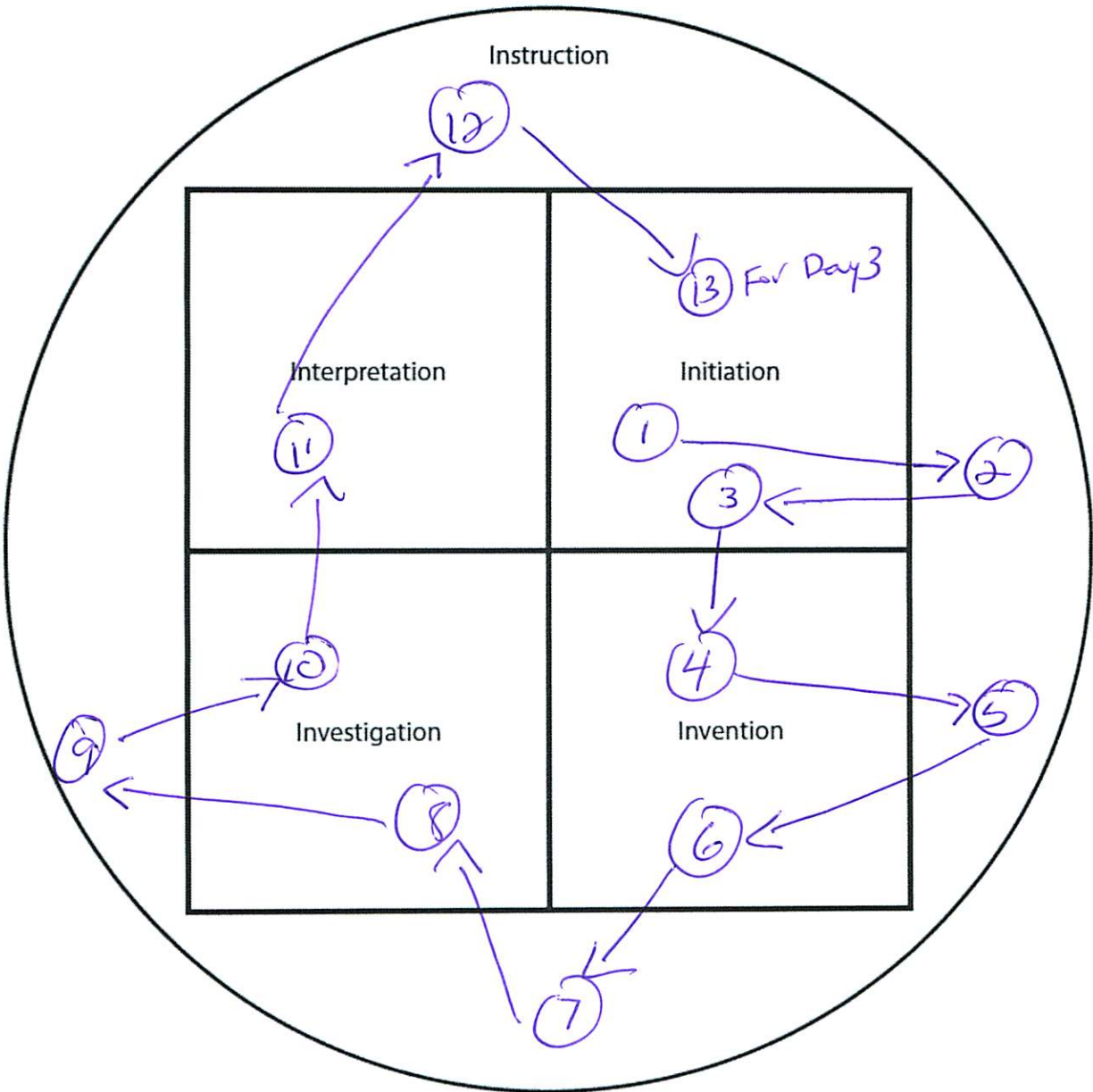
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Activity: Density Bags Day 2

What level did you observe? Individual Pair Small group Full Class

Why did you observe this level? Day 1 was challenging trying to do the entire class. 😊

Draw arrows indicating your progression through the TSI Phases of Inquiry. Number your arrows.



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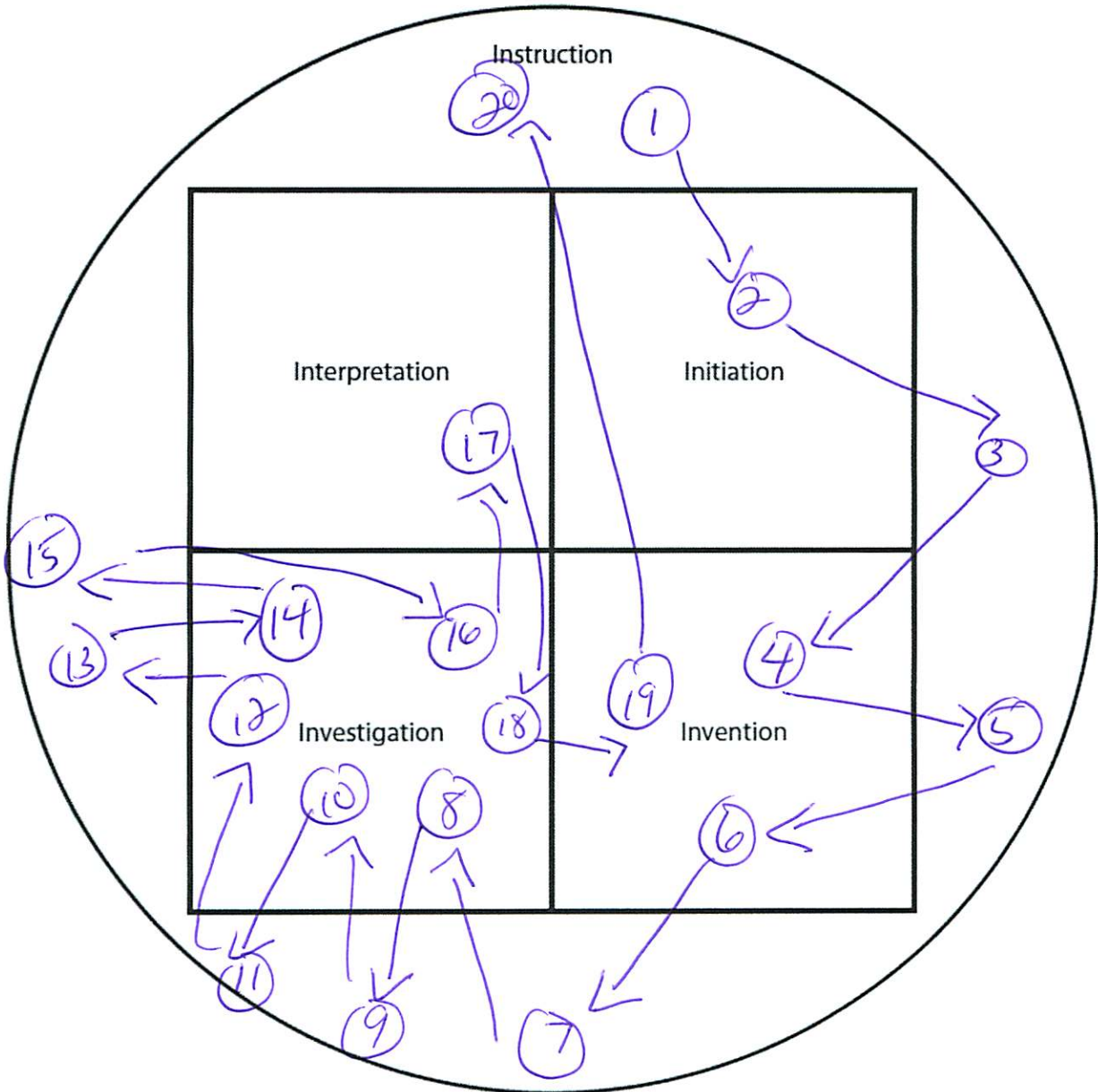
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Activity: Density Bags Day 3

What level did you observe? Individual Pair Small group Full Class

Why did you observe this level? Today I demonstrated, so it would be easier to do a small group.

Draw arrows indicating your progression through the TSI Phases of Inquiry. Number your arrows.



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