Basic Lab Considerations:

**1. Set up**

**a. What quantity of materials is needed for each group/student?**

1. **Surface tension of water**
   1. 2 shallow dishes (agar plates work). One dish half filled with normal tap water. The other dish half filled with heavy salt water
   2. Paper clips
   3. Paper towels
2. **Water as a solvent**
   1. 8 empty 150 ml beakers
   2. At least 50 ml of veg oil
   3. Pure tap water in a large beaker (300-400 ml)
   4. Table salt (1 cup)
   5. 2 stir rods
   6. 2 graduated cylinders
   7. ½ tsp measuring spoon
   8. Paper towels
3. **Cohesion**
   1. 2-3 pennies
   2. 2-3 eye droppers
   3. 150 ml beaker filled with tap water
   4. 150 ml beaker filled with salt water
   5. Paper towels
4. **Adhesion**
   1. Small dish. A watchglass or empty agar dish can work
   2. Either capillary tubing (if able) or a very thin clear straw
   3. Lightly colored water (green is preferred).
   4. Paper towels
5. **Density**
   1. 3 colors of dye, blue, red and yellow
   2. Pure water (dyed yellow)
   3. Lightly salted water (dyed red)
   4. Heavily salted water (dyed blue)
   5. 2-3 small tubes to place experiment in.
   6. 3, 150 ml beakers for storage of dyed water
   7. Paper towels
   8. Clay
   9. 3 droppers

**b. Space use in room?**

The lab stations will be located in a sequential order around the perimeter of the room

**c. Lab stations clearly labeled?**

Each student will have a worksheet that has all the directions on it for each work station. Each station will be clearly labeled with a number that will correspond to their worksheet.

**d. Sufficient work area for students?**

Movement is not required in this lab, so the ample space provided by the lab tables will suffice.

**2. Material distribution**

**a. What materials do the students need?**

1. **Surface tension of water**
   1. 2 shallow dishes (agar plates work). One dish half filled with normal tap water. The other dish half filled with heavy salt water
   2. Paper clips
   3. Paper towels
2. **Water as a solvent**
   1. 8 empty 150 ml beakers
   2. At least 50 ml of veg oil
   3. Pure tap water in a large beaker (300-400 ml)
   4. Table salt (1 cup)
   5. 2 stir rods
   6. 2 graduated cylinders
   7. ½ tsp measuring spoon
   8. Paper towels
3. **Cohesion**
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   5. 2-3 small tubes to place experiment in.
   6. 3, 150 ml beakers for storage of dyed water
   7. Paper towels
   8. Clay
   9. 3 droppers

**b. What is the most efficient way to get these to students?**

I will have all materials placed on each lab bench before the students arrive. If time does not allow this, I will have a cart with all materials in specific tubs that groups can grab and take to a station area.

**3. Pre Lab**

**a. Expectations/objectives/purpose for the day**

Complete all lab stations and review some of the post-lab questions.

**b. Safety considerations**

Students will be required to wear safety goggles when handling all materials in case salt water splashes up. Students will also need to report any broken glass to the teacher so safe cleanup can occur.

**c. Overview of lab set-up**

Students will place themselves in groups of 2, and I will assign them a lab station. At 5 minute intervals students will rotate clockwise to their next station until each group has visited each station once. All directions and materials will already be located at the station areas.

**d. What to do if lab is not completed during the hour**

If the lab is not completed in time, students will be given some time at the beginning of the next class period to watch the teacher (me) perform a quick demo on each of the stations. This will then be followed by a class discussion and some time for students to work on lab questions so they can turn them in before class is over.

**e. How this lab fits into the curriculum**

This experiment will fit into the unit of understanding the different properties and types of water that are located on the Earth. Students learn that water is a precious and unique resource. It is a resource that we cannot live without and we must learn to protect it.

**f. Clean up**

Clean up should be fairly simple for this lab. Dumping of water down the drain and simple soap and water cleaning will occur for stations that use food dye and oil. If time does not permit students to clean up then the teacher will do so.

**4. Hand outs**

**a. Procedure (can also be at lab stations)**

All necessary handouts and procedures will be combined in one four-page packet that will be handed out to each student.

**b. Data recording**

Students will record their data in tables provided in the work packet. This will help them organize their information by station, and help them tie it into vocabulary terms.

**c. Application/analysis**

Students will be able to have follow up post-lab questions where they will have to use their new vocabulary terms

**5. Assessment**

**a. How do I assess whether or not students are doing lab properly?**

I will be constantly circling the room, watching and listening. Listening is key in understanding if students get the material. If students are hypothesizing and critically thinking then they are engaged and making progress with their station.

**b. What will I have students do with their data?**

Students will put their data in a table and will be analyzed in questions for each station.

**c. How will I know that students have understood the concept the lab was illustrating?**

I will know if students understand material based on their participation in lab, answers on the lab, and class participation during post-lab discussion. This will help me to understand if I need to go over an aspect once more.

**6. Post lab**

**a. What to do with data/discussion**

The data will be used to answer questions that engage the student and promote critical thinking.

**b. Taking stock of student progress**

To monitor student progress, I will walk around, looking at their data and answers. I will correct them on some aspects, such as actual procedure of the station. However if students are hypothesizing incorrectly I many not correct them right away. Since there will be a class discussion on this, any misconceptions that arise will be laid to rest. I believe it is ok for students to make mistakes now and again, as long as they can learn from them and improve.

**c. What to do if not completed**

If the lab is not completed in time, students will be given some time at the beginning of the next class period to watch the teacher (me) perform a quick demo on each of the stations. This will then be followed by a class discussion and some time for students to work on lab questions so they can turn them in before class is over.

**d. Preview of tomorrow**

If lab is completed during one day, the next day we may move into either a biochemistry unit or a marine/aquatic life unit. Both of these can directly tie into the properties of water.