

EXTENSION 8.1.2: MYSTERY LIQUIDS

Objective:

Students will complete various tests of clear liquids to develop an understanding of physical and chemical properties. Once students observe all of the liquids, they will be given a Mystery Liquid. Based on the observations of the Mystery Liquid, students should be able to identify the mystery liquid.

Materials:

- 2 medicine cups
- various clear liquids
- baking soda
- pH strips

Procedures:

Obtain a medicine cup with 1 tsp. of a clear liquid. Complete the following tests for that liquid. Record all observations in the Data Table.

1. **Odor:** WAFT the air above the liquid so that you can safely smell the liquid without it being too strong. Is the smell strong? Fruity? Clean? Sweet? Bitter? Etc? Is there a smell at all?
2. **Texture:** Stick your finger in the liquid. How does it make your fingers feel? Is it runny? Thick? Slippery? Sticky? Etc? **Wash your hands** after feeling each liquid.
3. **pH (acid or base):** Take a piece of pH paper and dip it into the liquid. Look at the color that the paper turns then look at the colors given on the scale **at the table** to tell the pH. Record the pH NUMBER of the liquid being tested.
4. **Density:** Fill a medicine cup with water. Using a pipette, drop the liquid into the water in the medicine cup. Watch the drop from the side of the medicine cup so that you can observe the drop as it goes in. Does it sink? Does it float? Does it dissolve and mix in?
5. **Reaction to Baking Soda:** You should still have some liquid left in your original medicine cup. Take a "pinch" of baking soda and drop it in the liquid. Write down your observations. Does it dissolve? Does it react and bubble? Does it change color? Etc?

****Repeat procedures for ALL liquids and record observations in the Data Table****

Clean up: Wash and dry all cups and return to front (teacher) table.

Data Table

Liquid	Odor	Texture	pH #	Density	Reaction to Baking Soda
Hydrogen Peroxide					
Vinegar					
Isopropyl Alcohol					
Hand Sanitizer					
Hand soap					
Glycerin					
Mineral Oil					
Acetone					
Mystery liquid					

I think the mystery liquid is _____ because _____.

1. Which two liquids are most alike?
2. How could you tell if the chemical (liquid) reacted to baking soda? Give an example.
3. Give an example of a **qualitative** observation about the mystery liquid.
4. Give an example of a **quantitative** observation about the mystery liquid.
5. List 3 examples of PHYSICAL properties.
6. Give 1 example of a CHEMICAL property.
7. What test was most helpful to identify the Mystery Liquid?
8. Give an example of a CCC (Cross Cutting Concept) from the lab.
9. Give an example of a SEP (Science and Engineering Practice) from the lab.