White Before Your Eyes

You have learned how to describe matter based on its physical and chemical properties. You have also learned some signs that can help you determine whether a change in matter is a physical change or a chemical change. In this lab, you'll use what you have learned to describe four substances based on their properties and the changes that they undergo.

OBJECTIVES

Describe the physical properties of four substances.
Identify physical and chemical changes.
Classify four substances by their chemical properties.

PROCEDURE

1. Use Table 1 to record your observations throughout this lab.

2. First, you need to zero your balance. Next, cut a piece of paper into 4 squares and write the letter of one substance on each piece. Place one piece on the balance and find the mass of it. Leave the paper on the balance and add a one gram mass to the other side of the balance. Using a spatula, place a small amount of that substance on top of the paper (make sure the name of the substance and the name on the paper match). Keep adding substance or taking it away until the balance evens out. You now have 1 gram of your substance. **Record your observations about the substance's appearance, such as color and texture, in the "Unmixed" column of Table 1.**

3. Carefully pour the substance into a test tube and set it in a test tube rack for a moment. Use that same piece of paper and measure out another gram of the same substance. Place it in a second test tube. Do this two more times so that you have **4** test tubes containing 1 gram of that same substance.

4. Next, use a 10 mL graduated cylinder to measure out 4 mL of water (remember the meniscus) and then add this water to the first test tube containing your substance. Stir with the stirring rod. **Record your observations in Table 1 in the column labeled "Mixed with water."** Clean your stirring rod and graduated cylinder.

5. Next, use a 10 mL graduated cylinder to measure out 4 mL of vinegar (remember the meniscus) and then add this vinegar to the second test tube containing your substance. Stir with the stirring rod. **Record your observations in Table 1 in the column labeled "Mixed with vinegar."** Clean your stirring rod and graduated cylinder.

6. Add **five** drops of iodine solution to the third test tube containing your substance. Stir with the stirring rod. **Record your observations in Table 1 in the column labeled "Mixed with iodine solution."** Clean your stirring rod. **Caution:** Be careful when using iodine. Iodine will stain your skin and clothes.

7. Light the candle and carefully hold the bottom of the fourth test tube over the flame for 30 seconds.

8. Clean out (with soap and the test tube brush) all 4 test tubes. Wash them thoroughly so that there is no cross-contamination of substances. Place them upside down on the pegs of the wooden test tube rack.

9. Repeat steps 2–7 for each of the other substances. Don't forget to record your results.

Analyze your results

Table 1: Observations					
Substance	**Unmixed**	**Mixed with water**	**Mixed with vinegar**	**Mixed with iodine solution**	**Heat**
A					
B					
C					
D					

1. Examining Data What physical properties do all four solid substances share?

2. Analyzing Data In Table 2, write the type of change—**physical or chemical**— that you observed for each substance.

Table 2: Analyzing Data				
Substance	**Mixed with water**	**Mixed with vinegar**	**Mixed with iodine solution**	**Heat**
A				
B				
C				
D				

3. What signs of a chemical change did you observe (what told you there was a chemical change that took place for some of them)?

CONCLUSION

Classify each substance. Attach a sheet of paper with your reasoning for each substance. You should have a paragraph for each substance.