Chemistry 1 Name: _____
Jigsaw Reading: The Science of Slime Period ____ Date _____

Essential Question: In a chemical reaction new substances with new properties are formed. How does atomic level structure explain the properties observed at the macroscopic level?

Part 1: In your expert group, everyone will read the assigned section and answer the related question(s). Discuss how to present this information to others so that they can answer the questions. YOU MAY NOT pass around your paper to allow copying.

Read Sections 1 and 2 [Expert Group 1]:

1. What is slime?

2. **List** a few characteristics of slime mentioned in the introduction.

Read Sections 3 and 4 [Expert Group 2]:

3. What does the term 'viscosity' mean?

Read Section 5 [Expert Group 3]:

4. What is a non-Newtonian fluid? Cite 1 or 2 examples from the article.

5. What is a shear stress? List the four examples of shear stress.

Read Section 6 and Section 8 Diagram [Expert Group 4]:

6. What is shear thinning?

Read Section 7 and Section 8 Diagram [Expert Group 5]:

7. What is shear thickening?

Read Sections 9 and 10 [Expert Group 6]

8. We will be making the variety of slime made from glue and borax. How is cross-linking related to this type of slime?

Lab Procedure: Let's Make Slime

Materials:

1. 0 g Borax ($Na_2B_4O_7$) Food coloring (optional) 50 mL Elmer's Glue

Procedure:

1. Work with a partner. Put on your goggles.

2. Divide the labor:_____ will handle the Borax and _____ will handle the glue.

Borax Partner	Glue Partner
1. Go to the Borax station and weigh approximately 1.0 gram of Borax into a your beaker. 2. Fill the beaker to the 25.0 mL mark with water. 3. Return to your lab bench and stir with a spoon to dissolve the Borax.	1. Go to the glue station and pick up one pre-measured cup containing 50 mL of white glue and a plastic spoon. 2. Dilute your glue 50:50 with water (add 50 mL using graduated cylinder). 3. Return to your lab bench and stir with your spoon to mix the glue and water.
4. List each reactant in your data table on the backside of your handout. Describe each in detail. What is the color? Consistency? Is there an odor?	
5. There are four food color choices this year. Decide if you want to color your slime. When I call out the color you want, you will bring the Glue-Water cup to me. Stir until you get a uniform color.	
Be careful not to add too much of the Borax or your slime will be too stiff!!! 6. The Borax Partner will now slowly pour the saturated Borax solution into the glue cup while the Glue Partner keeps stirring with a spoon. As the two solutions mix a big glob of slime will form. 7. Quit adding the borax solution when there is still a little glue-water mixture left in the bottom of the cup. 8. Remove your slime from the cup and work with it until it is no longer sticky. Save it.	
You will Now Clean-up Your mess before investigating your slime's properties 9. **Borax Partner** Dump the leftover borax solution down the sink and rinse out the plastic cup. Put the cup and spoon into the dishpan in the sink by the vent hood. 10. **Glue Partner:** Dispose of the glue cup and spoon in the trash. Wipe down your lab bench.	
11. Divide your slime into two equal portions. Investigate your slime and record all observations of its behavior in the Investigation portion of the handout. 12. Write your reflection and turn in your lab paper to the red basket. Play with your slime until the bell rings. Store it in a Ziploc bag.	

Observations:

List each reactant and describe its physical properties in detail. After you make slime you will record its physical properties under the Products portion.

Reactants:	**Products:**

Investigation:

Apply a **shear stress** to your slime sample. Describe how your slime sample acted when you applied a shear stress. How did it act when the shear was removed?

Calculations and Analysis

1. Identify the solute and the solvent in the borax solution.

2. Calculate the molar mass of borax ($Na_2B_4O_7$)? Show your work.

3. How many moles of borax did you use to make your solution? Show your work.

4. Calculate the approximate molarity of your borax solution.
   Convert mL of water to L. _____mL = _____L