Honors Chem Hour\_\_\_\_\_ Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
Dr. Wexler
Lab: Making Slime
Date:

**Background:**

Guar gum is also known as guaran or galactomannan. The endosperm of the seeds of Cyamopsis tetragonolobus are ground to make guar gum.

Guar gum is used as a food emulsifier, stabilizer and thickener. It has five to eight times the thickening power of starch. Guar gum is often used as a stabilizer and binder to extend the shelf life of ice cream. Antacid [tablets](http://www.ehow.com/info_8263201_chemical-structures-guar-gum.html) use guar gum in some formulations as a binder.

The guar gum in water makes what's called a *colloid*; a pot full of long stringy molecules, like a bowl of spaghetti. The borax acts like connectors, causing these long guar gum strings to stick to each other forming a large network filled with water. Like Oobleck, slime is a shear-thickening fluid, meaning that it becomes harder when it is stressed.

**Procedure:**

1. Add 15 mL warm tap water to a cup.

2. Stir 0.10 g of borax into the water until dissolved.

3. In a separate cup: add 100mL warm tap water.

4. Stir 1.0g of guar gum into the water until dissolved (about 3-4 minutes).

5. Add food coloring to the guar gum solution.

6. Pour the borax solution into the guar gum solution and stir for about 1 minute or until the slime has fully gelled.

**Observations:**

**Part A: Density**

1. Measure the mass of the slime (to one decimal place): \_\_\_\_\_\_\_\_\_\_\_ g

2. Measure the volume of the slime (to the nearest mL): \_\_\_\_\_\_\_\_\_\_ mL

3. Calculate the density of the slime to one decimal place:

 \_\_\_\_\_\_\_\_\_\_\_\_ g/mL

4. Predict whether the slime will float or sink in water based on the density of your slime relative to the density of water (0.994g/mL)

The slime will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. Test your prediction by pinching off a small chunk of the slime and adding it to a cup filled with water. What do you observe?

6. Does this support your prediction?

**Part B: Physical characteristics**

1. Pick up the slime and pull it slowly apart. What happens?

2. Pick up the slime and pull it quickly apart. What happens? Is there a difference compared to “slowly”? If so, describe the difference.

3. Throw the slime onto the table. What happens? Does it hold together or split apart? Did it bounce like a solid or splash like a liquid, or somewhere in between?

4. Hit the slime on the table with your hand. What happens? Is there a difference between hitting it hard vs. pushing slowly?