FERROMAGNETIC SLIME

INTRODUCTION

With the onset of World War II, the United States needed to make stuff fast. This situation itself caused shortages, but in addition, access to many resources was restricted due to conflict.

This restriction made itself most obvious in the shortage of plastics and fibers. For the first time it became really necessary to make polymers synthetically instead of just modifying natural products.

Designing polymers for specific purposes became a big industry. In reality, the work with polymers had just begun by the end of World War II. Once the process began however, these synthetic polymers dominated industrial manufacturing, and they still do.

In Ferromagnetic Slime, students make and then investigate the properties of a polymer. You might want groups to divide up recipes and compare them.

MATERIALS

For Ferromagnetic Slime, you will need the slime and some strong magnets. If you use neodymium, caution students that they are very strong and may pinch their fingers. Students should use eye protection when making and using the slime.

Iron oxide is inexpensive and easily acquired online or at art suppliers. Borax and liquid starch are found in the laundry aisles of large grocery stores, usually near the bleach. Cream of tartar is an archaic leavening agent that can be found in most large groceries. Food coloring can be used to differentiate these mixtures.

STANDARDS

NGSS MS PS1-2
Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

NGSS MS PS1-3
Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.

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Students will consider chemical reactions and will engage in making some occur. These activities allow them to Plan and Carry Out Investigations and Engage in Argument from Evidence (Science and Engineering Practices) if you allow the students to make different attempts at the reactions with different formulas and to discuss whether or not the result is a chemical change.

NAME: DATE:

FERROMAGNETIC SLIME

Each recipe is for one group. The results may be stored and sealed in plastic for a few days.
There are two forms from which you might choose:

STARCH RECIPE

Ingredients:
¼ cup liquid starch
¼ cup white glue
2 tbsp iron oxide powder
Optional: a few drops of food coloring

Instructions:
Mix iron oxide powder into starch in a small bowl. Add in the glue and stir. Continue to stir, using hands if necessary.

BORAX RECIPE

Ingredients:
½ cup white glue
1½ cup water
1 tsp borax
2 tbsp iron oxide powder
Optional: a few drops of food coloring

Instructions:
In a small bowl, mix borax into 1 cup of water until it dissolves. Add the iron oxide powder and stir well. In a separate bowl mix the glue and the remaining ½ cup of water. Combine the contents of the two bowls and mix until polymer forms.

What are the similarities between the two resulting polymers?

What are the differences between the two resulting polymers?