

Magnetic Slime

This activity is a new twist to an old favorite! Everyone loves making slime, but today we are going to make it magnetic. Mixing together different ingredients, you will create a slimy mixture that can move without you physically touching it.

TEKS:

3.6D Observe forces such as magnetism and gravity acting on objects.

5.5A(rs) Classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy.

5.5C(ss) Demonstrate that some mixtures maintain physical properties of their ingredients such as iron filings and sand.

5.5D(ss) Identify changes that can occur in the physical properties of the ingredients of solutions, such as dissolving salt in water or adding lemon juice to water.

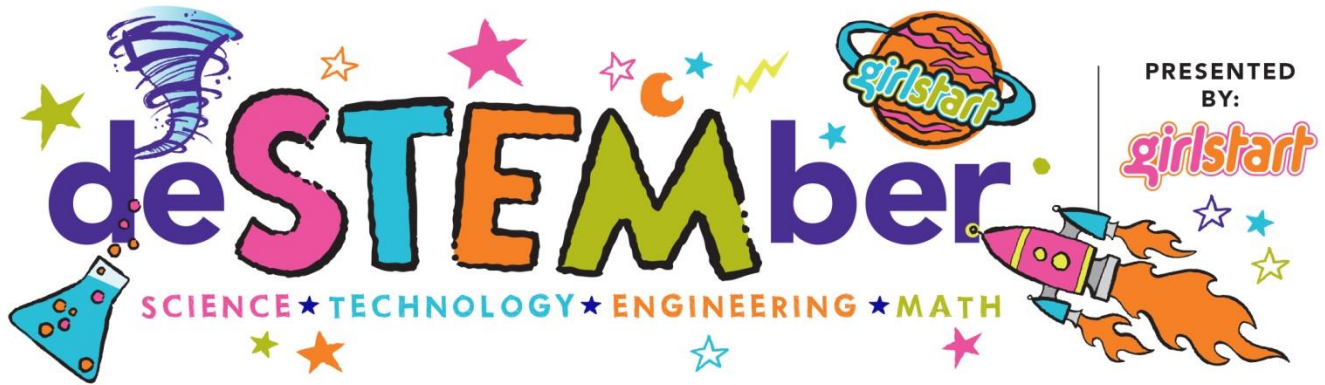
Materials (per magnetic slime batch):

- 1 teaspoon borax laundry booster - http://smile.amazon.com/Borax-Mule-Team-Detergent-Booster/dp/B000VCFAOX/ref=sr_1_1?ie=UTF8&qid=1418069036&sr=8-1&keywords=borax
- 8 oz. bottle of white school glue
- 2 tablespoons iron filings - http://smile.amazon.com/Dowling-Magnets-Do-731019-Iron-Filings/dp/B000BJRLTI/ref=lh_ni_t?ie=UTF8&psc=1&smid=A2NL9UUKFTRQH OR <http://www.stevespanglerscience.com/iron-filings.html>
- Large, disposable mixing bowl
- Plastic cup
- 1 Neodymium (rare Earth) magnet (a regular magnet is not strong enough) - http://smile.amazon.com/Craft-Hobby-Neodymium-Magnets-3x1-5mm/dp/B0065O63BK/ref=sr_1_2?ie=UTF8&qid=1417806678&sr=8-2&keywords=neodymium+rare+earth+magnets
- Water

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How To:

1. Pour the entire bottle of 8 oz. white school glue into a disposable mixing bowl.
2. Add water to the empty glue bottle, tighten the lid, and shake it up really well.
3. Pour the water and glue mixture from the glue bottle into the mixing bowl.
4. Add 2 tablespoons of iron filings to the bowl and stir the water, glue, and filings together until they are well mixed.
5. Measure $\frac{1}{2}$ cup of water and pour it into the plastic cup.
6. Add 1 teaspoon of borax to the cup of water and stir the solution.
7. Add the borax-water solution to the mixing bowl.
8. Mix it up VERY well.
9. Use the Neodymium magnet to make the slime dance and move! Watch as it transforms before your eyes.

CAUTION:

- Neodymium magnets are extremely strong. Fingers can easily get pinched when trying to separate the magnets. It is okay to leave the magnets stuck together.
- Keep magnets away from cellphones, computers, and other electronics!

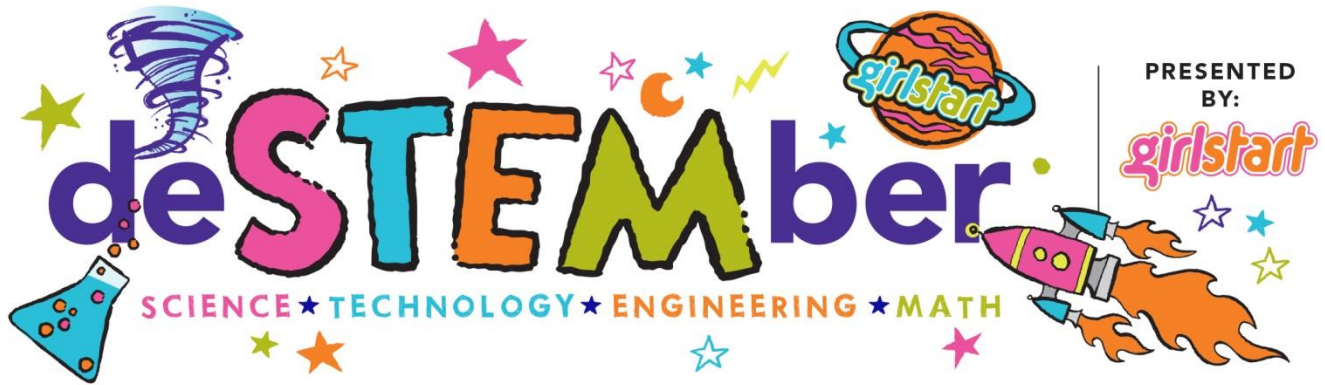
Why Does It Work?

The iron oxide powder in the slime is attracted to the magnet. Iron is one of three elements that is magnetic at room temperature. The other two elements that are magnetic at room temperature are cobalt and nickel. The mixture of school glue with borax creates the slimy substance that holds the iron. What prevents the iron filings from flying out of the slime and to the magnet? The slime is able to hold on to the iron filings by adhesion. Adhesion is the force that holds molecules of different substances together. The slime is also bonded together by cohesion, the force that holds molecules of the same substance together. This combination of magnetism, adhesion, and cohesion results in the stretchy, moving slime when a neodymium magnet is held near the mixture.

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Career Connection:

Chemical Engineers combine natural sciences and life sciences together with mathematics and economics to produce, transform, and properly use chemicals, materials, and energy. They also design processes and equipment for large-scale safe and sustainable manufacturing of chemicals. Food, fuel, paper, plastics, and chemicals are some of the most common products that chemical engineers design processes for.

Resources:

- <http://www.stevespanglerscience.com/lab/experiments/magnetic-slime>

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