



Sidewalk Chalk

Primary Audience: 3rd – 5th

Description: Make your very own sidewalk chalk!

Key Words: Chalk, Exothermic

Materials:

- Plaster of Paris (available in the hardware or craft sections of most department stores)
- Small paper cups (3.5 or 4 oz)
- Measuring spoons
- Plastic spoons
- Liquid food coloring
- Water
- Newspapers

Instructions:

1. Spread newspapers over your work surface. This experiment can get messy!
2. Measure 2 teaspoons of water into the paper cup. Measure 1 teaspoon of food coloring (you pick the color) into the paper cup.
3. Measure 2 tablespoons of plaster of Paris into the cup and begin stirring with the plastic spoon immediately. Stir for about a minute. The plaster and water should have the consistency of mud. You may need to add a little more water if the plaster becomes crumbly.
4. Set the cup aside for at least 15 minutes for the plaster to harden. Check the cups at 5 minutes and 10 minutes after you finished mixing the water and plaster. Do you notice any changes in the way the outside of the cup feels? (Try not to touch the plaster inside the cup until it hardens)
5. Peel away the paper cup and you have made sidewalk chalk!

Note: Be very careful NOT to put any plaster of Paris down the sink, as it will clog the drain! You should also be careful to clean up any spills. If the powder gets wet, it will harden and may be difficult to get off.

What's going on?

Feel the heat 5 - 10 minutes after the plaster of Paris and the water mix. This is known as an exothermic reaction. "Exo" means outside and "thermic" means heat. When the calcium sulphate in plaster of Paris dissolves in water, heat is released. This type of heat releasing reaction also occurs when other substances such as salt or some detergents are dissolved in water. Put some laundry detergent on the back of your hand and then rinse it off under a slow stream of water in a sink. Your hand will feel warm from the detergent dissolving.

Once the cup is no longer warm to the touch, the plaster has "set up" or hardened and is ready to use on your neighborhood sidewalk or playground. Be sure you have an adult's permission to use the chalk outside. Clean up is easy - just spray the sidewalk down with water, or wait for a good rain.

Further Exploration:

Try making many different colors of chalk. Check the food coloring box to see how to mix the colors to produce new ones. You can also try changing the amount of water that you use. Does this change the way the plaster hardens? The time it takes to harden? The amount of heat generated? Does the amount of water in the cup change the way the chalk feels or the way it writes on the sidewalk?

Relevant Ohio Science Content Standards:

Physical Sciences: 4.2,4.5,6.2