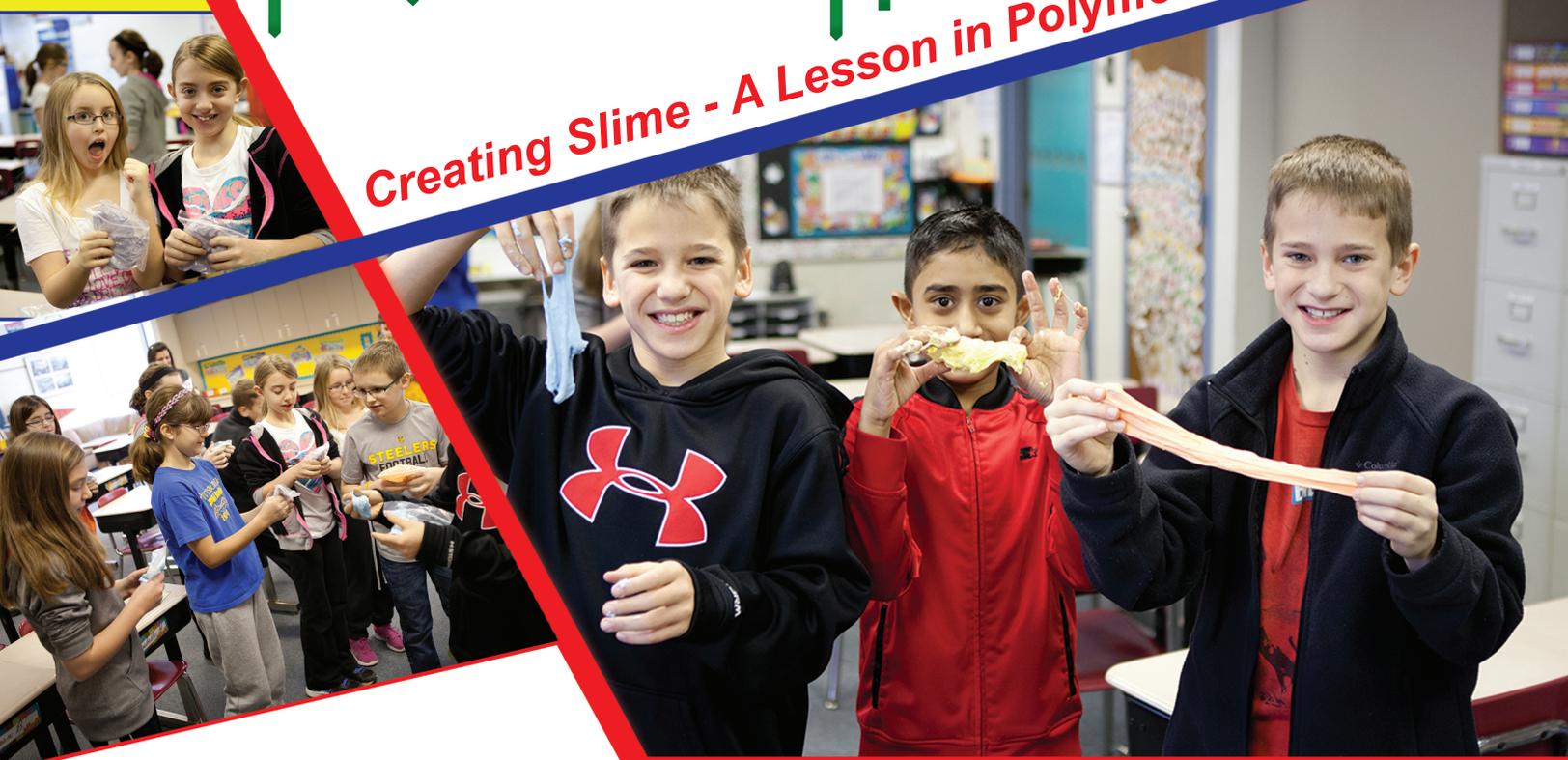


Slime

Creating Slime - A Lesson in Polymers



Mike Nowak
Public Affairs & Strategic Outreach Division
National Energy Technology Laboratory

626 Cochran's Mill Road
Pittsburgh, PA 15236
(412) 386-6020

www.netl.doe.gov/about/education



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INSTRUCTOR BACKGROUND

National Standards for Science

Grades K-4 Standard B - Exploring basic concepts about the structure and properties of matter. Discuss notable physical and chemical changes that take place each time a new ingredient is added.

Learning Objective

Students will attain a basic understanding of polymers. They will realize that polymers are all around them and that they use them every day. Students will engage in making slime, a polymer that is flexible when touched. Students should be encouraged to think about new types of synthetic polymers that could be formed to make life easier for everyone, and they should be able to list examples of polymers found in nature and in their home.



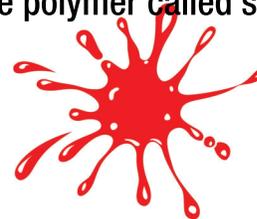
Introduction

Everything around us is made up of different elements, such as oxygen, hydrogen, and sodium. When elements string together they form molecules. Polymers are groups of molecules that are linked together in a chain to form something tangible. Polymers can be flexible, stiff, solid, or spongy. They can be found in nature, such as the bark on a tree, or they can be synthetic (man-made), such as the plastic bottles that contain the pop you drink. Everything around us made from a polymer; therefore it is important to understand how they are created and how we can create new ones to make life easier for humans.



Activity Description

The mixture of glue, water, and Borax creates “Slime.” The glue is already a polymer. When the glue is first mixed with the water, a new polymer is formed, but you cannot see this until the Borax is added. When Borax is mixed with the glue and water mixture, causes a chemical reaction by linking the existing glue and water polymer with other molecules in the Borax. This reaction makes the mixture thicker and turns it in to a new, flexible polymer called slime!



Instructions



Combine 1/4 cup water with two cups of glue in a bowl. Mix together and set aside.



Combine one teaspoon Borax with one cup of water in a bowl. Mix together and set aside.



In a plastic bag, combine the glue mixture with one tablespoon of the Borax mixture. Knead the mixture together in the bag. Add more of the Borax mixture if needed.



Materials List

Elmer's White Glue or Elmer's School Glue Gel

Borax

Water

Two Bowls,
Measuring Cups,
Tablespoons, and Teaspoons

Food Coloring

Plastic Baggies



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Follow-up Suggestions

1. Have students use different measurements of water, Borax, and glue. What are the results? Is the slime thicker, stickier, wetter? What consistency of ingredients makes the strongest flexible polymer?



2. Help students understand that polymers are all around them and that they use them every day. Have students make a list of polymers found in nature, and a list of polymers made by man.



3. Have different polymers available for students to look at and compare to the consistency of the slime, such as Jell-O, nylon, plastic bottles, chocolate bars, cotton balls, popsicle sticks, packing beads, rubber, metal pipes, basketballs, etc. Encourage students to research the elements used to form the molecules to make the polymer material for these different items.



4. At the National Energy Technology Laboratory, researchers are finding ways to convert CO₂ in to useful products, such as plastics! This is a very inventive way to take captured CO₂ gas and use it to make polymers that can benefit humans! Read more about these polymers here:

<http://energy.gov/fe/articles/recycling-carbon-dioxide-make-plastics>

STUDENT WORKSHEET

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What did I know about polymers before this activity?

What happened when the ingredients were combined to form the slime?
What was the consistency of the slime?

What happens when different measurements of the ingredients are used?
Can I form a stronger polymer? Is my polymer stickier? Is it more wet?
Is it more or less stretchy?

What have I learned about polymers?

Make a list of polymers found in nature.

Make a list of synthetic polymers.



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