

Polymers All Over the Place!

A Community in the Classroom Presentation for Grade 5

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STANDARDS CONNECTION

Grade 5 Physical Science: Elements and their combinations account for all the varied types of matter. Properties of Common Molecules.

INSPIRATION AND INVOLVEMENT

What do CD's, trash bags, silk shirts, and rubber bands all have in common? They are all made from materials called polymers! Most materials we use everyday are made from polymers, but what exactly is a polymer? How are they made? How can there be so many different kinds? Organic chemists explain how polymer chains are made and how they combine to form a vast array of materials

VOCABULARY

Polymers, Monomers, Connectivity

LEARNING EXPERIENCES

Activities:

Students will construct polymer models to understand their structures and make different 'slime' polymers to compare their properties.

I. Introduction

- A. Short introduction of ourselves as students/chemists at UC Berkeley.
- B. Overview of materials (everything from shirts to shoe soles!)

****Materials classification scheme on board (ceramics, metals, polymers; polymers further subdivided into plastics, rubber, natural fibers)****

- 1. General: ask students for examples of above materials in classroom
 - 2. Specific: bring examples of above materials
- C. “Same unit, but different connectivity” theme: plastic bag vs. milk jug example (Ask class for differences in properties between these two materials)

II. Main presentation

A. Model polymers

- 1. Draw “same unit, different connectivity” example on board; emphasize how this is one way that polymers/materials give rise to different properties
- 2. Demonstrate another way to generate materials with different properties (using different monomers!)

****Activity: give small groups different ratios of gum drops/gummy worms, ask them to construct different “materials” with toothpicks. Have each group describe the properties of the material they create.**

B. Constructing polymers

****Activity: borax glue! Provide each group with different ratios of the sodium borate solution and glue/water mixture. Have them describe the various properties of their materials and how they compare to those constructed by other groups. What are the differences in the properties of the materials? What is responsible for this, etc.?**

III. Closing