



Polymer Activity from the:

Teachers may reproduce this activity for their use.

Polymer Models

Grades: middle school

Science Standards: Unifying Concepts and Processes, Physical Science

Purpose: to make a model of a long-chained molecule or polymer

Materials:

- Hot glue guns (high temperature glue guns work best), 4-6 per class to share
- Clear hot glue sticks (high temperature glue sticks work best), one per model
- Colored hot glue sticks, one per model
- Glitter glue sticks, one per model
- Plastic plate of water, 5"-6" in diameter
- Plastic pellets or resins or small stars or large glitter
- Protective surface for glue guns
- Paper towels to dry models and clean area

Procedure:

- Place about $\frac{1}{2}$ inch of water in the plate.
- Heat up glue guns making sure each has a glue stick inserted.
- When hot, extrude one glue stick in random circular shapes on the surface of the water.
- Sprinkle a few pellets (stars or large glitter) onto the warm glue strands.
- Extrude a colored layer onto the white glue strands.
- Add a few more pellets.
- Extrude a glitter glue layer onto the colored layer.
- Use 1 small glue stick for each application.
- Remove model, set on a paper towel to dry, and hang or display finished product.

Teacher Notes:

Description: By extruding hot glue into a plate of water in swirls, students can make models of polymers that replicate the random intertwining of large macromolecules. Addition of plastic pellets or resins at the intersection of extruded glue strands represent cross-linking of the polymer chains. Glitter glue represents one of the many additives that are used to strengthen or change the properties of a finished piece of molded plastic. Color is another additive manufacturers use in making polymer products.

Optional materials:

Surge protector if several glue guns are being used from a single outlet.

Safety precautions:

Have all glue guns properly grounded.

Remind students not to touch the ends of the glue guns or the glue being extruded.

Do not get electrical cords wet.

Have a safe place to set the glue guns while hot.

Safety goggles may be used.

Hot glue guns may be purchased at a dollar store. The colored and glitter glue sticks were ordered from Amazon.com through Jo Ann Fabrics.

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Polymer Ambassador Web Site: www.polymerambassadors.org