

Needle Through a Balloon

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Endorsed by: These lesson plans are the result of the work of the teachers who have attended the Columbia Education Center's Summer Workshop. CEC is a consortium of teacher from 14 western states dedicated to improving the quality of education in the rural, western, United States, and particularly the quality of math and science Education. CEC uses Big Sky Telegraph as the hub of their telecommunications network that allows the participating teachers to stay in contact with their trainers and peers that they have met at the Workshops.

Date: May 1994

Grade Level(s): 4, 5, 6

Subject(s):

- Science/Chemistry

OVERVIEW: This lesson can be utilized in a unit on Chemistry specifically when discussing various molecules. One kind of molecule is the polymer. This demonstration and/or hands-on activity can allow children to experience the polymer.

PURPOSE:

This activity is designed to help children understand polymers and to experience the enjoyment of Science.

OBJECTIVES:

Participants will be able to

1. insert a needle through a balloon
2. understand and explain polymers
3. explain why the needle can be inserted through a balloon

RESOURCES/MATERIALS:

balloon one of the following pointed objects: 30-35cm (12-14) upholstery needle sharpened knitting needle bamboo skewer coat hanger wire sharpened to a point a small amount of cooking oil paper towel or cloth (optional)

ACTIVITIES AND PROCEDURES:

Time: Getting ready: None

Doing the activity: 15-20 minutes

Safety and Disposal: For personal safety, store the needle with the point inserted in a cork when not in use. This also keeps the needle point from becoming dull.

Procedure:

1. Inflate the balloon and tie it off. You might want to let a little air out of the balloon before tying it off, so it will be easier to puncture the balloon without breaking it. Make sure the balloon is not longer than the needle.
2. Dip the tip of the needle or bamboo skewer into the cooking oil. Alternatively, use a paper towel or cloth to spread the oil along the entire length of the needle.
3. Using a gentle twisting motion, insert the needle into the nipple end of the balloon, the end opposite the knot, where the balloon is thicker.
4. Continue pushing and twisting the needle until it emerges from the other side close to the tied end. The balloon will not burst.
5. Pull the needle out slowly through the tied end. The balloon will slowly deflate.
6. After the needle is out, jab the balloon sharply with the needle. It will pop.
7. Ask the students why the balloon did not pop when the needle went through it. Tell them that the balloon is made of molecules (polymer chains) that stretch and seal around the needle. When the balloon was jabbed the molecules did not have time to stretch and surround the needle.

TYING IT ALL TOGETHER: This activity can be an introductory activity or used as part of a series of lessons on polymers. Activities that can be used before or after the balloon lesson are the Rubber Band Stretch, Superballs (made from glue and borax), and Glop (made with cornstarch and water).