



Young Scientist Lab

in partnership with:  **Discovery**
EDUCATION™

WHELMERS

Sandwich-Bag Dart Board

Sharp pencils and water-filled sandwich bags demonstrate the nature of certain polymers.



WHAT YOU NEED

- several pint- or quart-size sealable plastic storage bags
- several sharpened pencils
- tap water
- sink or spill pan

WHAT YOU DO

1. Fill a bag three-fourths full with tap water and seal it shut.
2. While holding the bag by the sealed mouth and allowing it to hang vertically, quickly thrust a sharpened pencil through both walls of the bag below the water line. BE CAREFUL! Do not withdraw the pencil. With practice, you should be able to perform the feat with the loss of only a few drops of water.
3. Repeat the action with several pencils. See how many pencils you can thrust through one bag. You'll be amazed.

WHAT HAPPENS

Most materials commonly known as plastics are made of very long molecules called polymers. Chemists design polymers to have different characteristics, making them useful in a variety of situations. The material used to make sandwich and storage bags, polyethylene, consists of polymer molecules intertwined and linked to form a weblike matrix. That molecular web, with all its connections between molecules, gives polyethylene its characteristic resistance to tearing. That's why the bag does not tear and holds tight against the sides of the pencil. No (or very few) leaks!