

Shrinking Plastics

What Do I Need?

- Clear plastic salad or bakery containers with a number 6 recycle code
- Permanent markers
- Oven or toaster oven
- Heat-resistant gloves or pot holders
- Scissors
- Aluminum foil

Caution: Adult supervision required

What Do I Do?

1. Preheat the oven to 325-350° F.
2. Cut a large square or other shape from the plastic container.
3. Use permanent markers to decorate the plastic. If you would like to wear your finished project as a necklace, use a hole punch to punch a hole through the plastic.
4. Place the plastic piece on a cookie sheet or a piece of aluminum foil and put it in the preheated oven with the decorated side facing up.
5. Watch the plastic closely! It should shrink in less than one minute.
6. Carefully remove the cookie sheet from the oven. Be careful not to touch the plastic with your bare hands – it will be very hot!
7. If the edges of the plastic curl up, you can invert the plastic onto a piece of foil and flatten it by pressing down with a glove or potholder. The plastic should cool in a minute or two.



What's Going On?

Plastic is a type of polymer. Polymers are made of long chains of repeating molecules. Certain polymer plastics, such as polystyrene, have the ability to shrink when heated because of the way that they are made.

Normally the polymer chains in a piece of polystyrene are jumbled together in a random pattern. However during the manufacturing of salad lids and bakery boxes, the polystyrene is heated and stretched out into a thin film. The polystyrene is then cooled very quickly. The sudden cooling process “freezes” the molecular arrangement of the polystyrene in this stretched out arrangement. If the plastic is reheated, it returns to its original shape. (Imagine a balloon returning to its original shape when the air is released.)

Although the area (length and width) of the polystyrene is reduced during the heating process, the mass remains the same. The polymer chains simply return to their original (non-stretched) state. Shrinking also causes the thickness and the density of the plastic to increase.