The Journey Inside^{SM}: Microprocessors
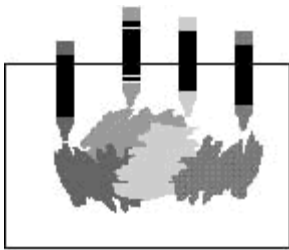# Student Handout: Fabrication Art

Fabrication Art

Chip making takes place in a special room called a clean room. The process involves many steps that create layers of material on a wafer of silicon.

The idea behind the layering process used in making chips is simple. A stencil, called a mask, is made to look like the desired layer. The stencil pattern is transferred from the mask to the wafer using light. The unwanted material is removed by a process called etching. Another layer is added. The process is repeated using a different mask. In this manner, layer after layer can be built up.

The two activities in the following section illustrate a method of building layers, somewhat like the layering used in chip manufacturing. Each activity produces some fabrication art.
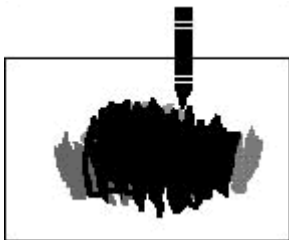
Activities

1. Using a variety of bright shades and light shades of crayons, color a small area on a piece of paper.

    Press firmly so that the area is entirely covered with a waxy layer of various colors.

    Take a dark color, such as black or dark blue, and completely cover the colored area of your page. Press firmly so that you can't see other colors through your dark layer.
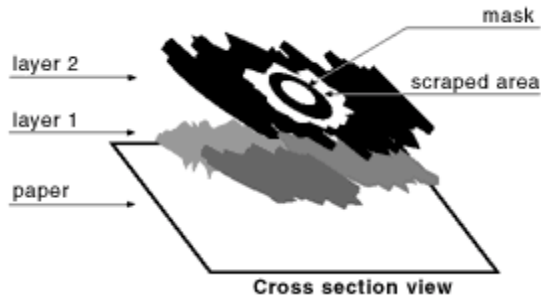

    Place an object, such as a washer or a coin, on the top layer.

    Use a paper clip to scrape away the top layer so that the image of the object remains.

Use a variety of objects on the top of your document to produce a design that is interesting. Simple shapes will work best.

Cross section view

2. Customizing your mask is similar to the job done by the designer of a computer chip. Create a mask using lightweight cardboard on which you draw a pattern. It might simply be your initials. Once the pattern is drawn on the cardboard, carefully remove the pieces that represent your pattern. Your custom mask is the "punched out″ pieces, not the remaining cardboard from which you cut them. Place your mask on a colored area and scrape away the top layer. Can you customize further by adding another layer?