

How do I see colour?



Build a sun catcher that allows you to see the various colours in white light.

Setting: Indoors / Outdoors

Time: 1 hour

Concepts: colour, light

Skills: observing, building

Subject(s):

- ✓ Physics
- ✓ Engineering and Technology

Ages:

- ✓ 3-5
- ✓ 6-8

Materials:

- Styrofoam plates or trays (like those in which some vegetables or fruits are sold)
- Clear acetate or other clear plastic sheet
- Permanent markers
- Tape
- Scissors
- Small cookie cutters
- String or yarn
- Hole punch or a sharp pencil



Safety First!

Some plastics are difficult to cut. Ask an adult for help if sharp scissors are needed.

What to do!

1. Cut the edges off a Styrofoam plate or tray so that you have a flat surface.
2. Create holes in the Styrofoam flat surface with the small cookie cutters.
3. Cut pieces of acetate large enough to cover the holes made with the cookie cutters, and colour them with markers of various colours.
4. Tape the coloured pieces of acetate behind the openings in the Styrofoam.
5. Punch a hole near the top of the piece of Styrofoam using a hole punch or a sharp pencil. Put a string or piece of yarn through and knot it so that it makes a loop.
6. Hang the sun catcher in a sunny spot or attach it to a window.

What's happening?

How do I see colour?

White light from the sun is made up of different colours. When you look at a rainbow, you can see white sunlight broken up into its components as a beautiful colour spectrum of red, orange, yellow, green, blue, indigo and violet. By using a filter such as the pieces of coloured acetate, you allow only light of a certain colour to pass through it. For example, if you coloured one of the pieces of acetate blue, you are only allowing the blue light rays to go through it. The filter will absorb all other colours of white light.

Why does it matter?

Light is required for colour to exist. When white light hits an object that appears red, for instance, that object absorbs all the rays of coloured light except the red ones, which it reflects. When our eyes perceive the reflected light rays, they send a signal to our brain which will interpret what we are seeing as the colour red.

The back of our eye balls are covered in light-sensitive cells. Some transmit information about colours to the brain and some transmit only black and white information. The cells that perceive colours are not as sensitive as the others, making it much harder to see distinct colours in places where there is not a lot of light (like at dusk or in a dimly lighted room).



Investigate further!

- Shine a flashlight on a glass or Plexiglas triangular prism and see how light is split into the colours of the visible spectrum (red, orange, yellow, green, blue, indigo and violet). You could also use a crystal pendant from a chandelier to see what happens to the light that passes through it. Be sure to aim the light passing through the prism towards a white wall or white surface to best see the light spectrum. (Note that this will not work if your flashlight has an LED lightbulb.)