

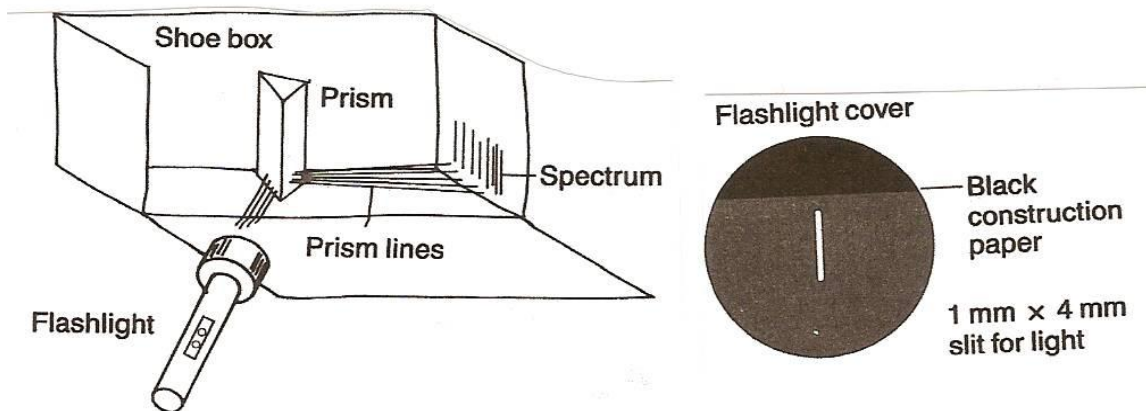
SPECTRUM OF LIGHT

Activity 3: White light is a mixture of all the colors your eyes can see. When white light is separated into its component colors the result is a colored band called a spectrum. A spectrum can be produced by passing a beam of white light through a prism. The prism refracts or bends the light waves as they pass through. Since all colors do not refract equally each color leaves the prism at a different angle creating a spectrum of colors.

Materials: prism, flashlight, black construction paper, double stick tape, shoe box, white paper, felt-tip pens in spectrum colors

Procedure:

- 1. Hold a shoe box with one long side facing you and cut down through both front corners. Fold down the side of the box.**
- 2. Cut out a circle of black construction paper the size of the glass flashlight cover. Fold the paper in half. Cut across the center of the fold and remove a section 4 mm long and 1 mm wide. Make this cut carefully, the slit is very narrow. Use double stick tape to attach the paper to the flashlight cover.**
- 3. Use double stick tape to hold the prism inside the box. Position the flashlight and prism so that the beam of light forms a spectrum on one end of the box. You may want to tape a piece of white paper over that end of the box.**
- 4. Draw the spectrum on the paper or box, labeling the colors. Be careful not to move the prism or the flashlight as you work.**
- 5. Make a drawing of the box, flashlight, prism and spectrum as you observe them from above.**
- 6. Place a thermometer under the blue end of the spectrum. Wait a minute or two, and then record the temperature. Repeat the process on the red end.**



Questions:

1. Which color of light refracted most? Which is refracted the least? _____
2. Starting at the red end list the colors in order of appearance. _____
3. Is there a temperature difference when the thermometer is moved from the blue light to the red?
Explain. _____

4. Using what you have learned can you explain why colorless gemstones such as diamonds emit flashes of color in white light?

5. Why are the spectrum colors arranged in the order you observed? _____
