

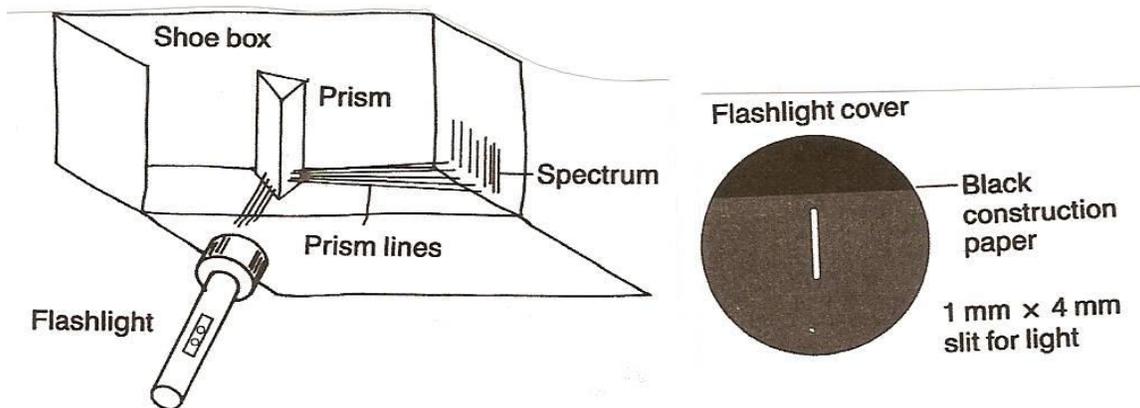
## **SPECTRUM OF LIGHT**

**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. \_\_\_\_\_

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4. Using what you have learned can you explain why colorless gemstones such as diamonds emit flashes of color in white light?  
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5. Why are the spectrum colors arranged in the order you observed? \_\_\_\_\_  
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