

## SECTION 2

### Enrichment

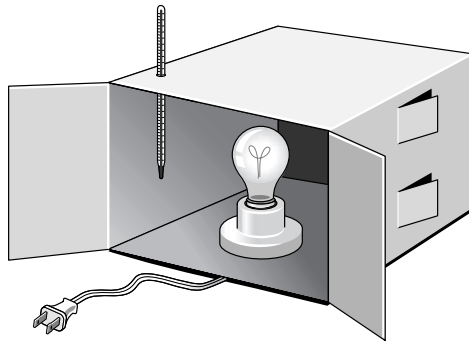
# Thermal Energy and the Need for Ventilation

## Materials



large (tall) cardboard box  
100-watt bulb in a ceramic socket  
thermometer  
scissors  
clock

## Constructing the Apparatus



Follow the drawing as you proceed. Cut two flaps on one side of the box, one near the top and one below the first one but near the bottom. Make a hole in the top of the box away from the side with the flaps. This hole should be just big enough to hold the thermometer. Use tape to secure the thermometer if the hole is too big. Set the bulb inside the box but be sure it is not under the thermometer.

**CAUTION:** Be sure the bulb is not touching the sides or any part of the box. Run the wire from the bulb out through a hole in the bottom of the box. Close the box. Record the temperature before plugging in the cord.

## Procedure

**Trial A:** Predict what you think the temperature inside the box will be after the light is on for 5 minutes. Be sure both flaps are closed. Plug in the cord. Wait 5 minutes. Unplug the cord. Record the temperature. Open the box and allow the temperature to return to what it was before you plugged in the bulb.

**Trial B:** When the temperature has returned to the starting temperature, close the box except for the top flap. Repeat the procedure in Trial A.

**Trial C:** When the temperature has returned to the starting temperature, close the box except for the bottom flap. Repeat procedures in Trial A.

**Trial D:** When the temperature has returned to the starting temperature, open both flaps. Repeat the procedure described in Trial A.

## Data

Starting Temperature \_\_\_\_\_

Conditions	Predicted temperature	Actual temperature
Both flaps closed		
Top flap open, bottom closed		
Top flap closed, bottom open		
Both flaps open		

## Conclude

1. How close were your predictions to the actual values?

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2. By what method(s) is air inside the box heated?

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