b) You know that the air above the light bulb gets warm by radiation and conduction. This hot air rises and cool air from the sides takes its place. Draw a diagram that can show the movement of air around the hot light bulb, through the chimney, and past the pinwheel that can cause the pinwheel to rotate.

The movement of heated air is called convection. Convection currents of hot air can also be used to cook food, and some ovens work using **convection** currents. This is a third way heat energy is transferred, and a third way of cooking food.

Part B: Observing the Transfer of Heat Energy

1. Potatoes are very useful models for observing how heat energy is transferred when cooking food. When you heat a potato to 60°C (or higher), there is a change in its appearance. The potato changes from an opaque, white texture and becomes translucent.

If you put some potatoes into boiling water for various lengths of time, and then remove them and cut them open, you will see the increase in size of a ring of translucent material. (Note: It is easier to see the ring of translucent material if you do not peel the potato.)

Design an experiment using five different potatoes and boiling water. Use time as the independent variable and the growth of the translucent ring of cooked potato as your dependent variable. Have your teacher approve your experiment before you begin.

2. Construct a data table for recording the width of the ring in millimeters and the cooking time in minutes. Graph the data.
   a) Include your data table and graph in your *Active Chemistry* log.
   b) What conclusions can you draw about cooking time and heat-energy transfer?
   c) How is this kind of data useful for developing recipes?
3. All three types of heat-energy transfer occur when you are boiling the potatoes in your experiment.
   a) Diagram and label the three types of heat-energy transfer (include a hot plate, beaker, water, and potatoes).

Use extreme caution around boiling water. It can cause very serious burns.

The potatoes will be very hot. Remove them very carefully using tongs.

Wash hands and arms thoroughly before leaving the lab area.