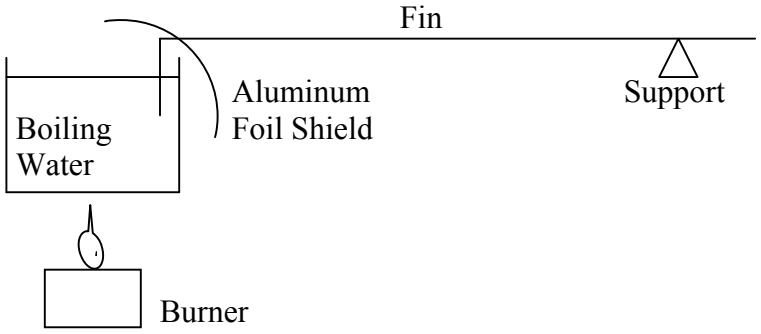
Home Experiments

These two experiments can be completed with common household items. Each will allow you to collect preliminary data, which will give you some insight prior to the pin fin laboratory experiments.

1. Constant Area Fin

Fill a pot to the rim with water and bring it to a boil. Cut a 35 cm long section from a metal wire hanger. Bend a 5 cm section at one end and immerse it in the boiling water. Support the wire in the horizontal position as shown. Use aluminum foil to shield the wire from the heating element or flame of the stove. When the system has reached steady-state, determine the distance from the boiling water along the wire where the temperature drops to 37°C (body temperature). Describe how you carried out this experiment and compare your result with theoretical prediction using the fin solution.



2. Transient Conduction

Place a 35 cm long section of wire hanger in an oven and heat it to 150°C. Remove the wire from the oven and suspend it horizontally in still air using simple supports as shown. Allow the wire to cool by natural convection. Measure the time needed for the surface temperature to drop to 37°C (body temperature). Compare the result with theoretical prediction.