

Heat Energy Transfer & Efficiency

Name: _____

Date: _____

Goal

Determine the efficiency of a hot plate to heat a piece of Aluminum.

Hot Plate

A block of Aluminum is placed on a hot plate. The student investigating the situation measures the mass of the Aluminum to be 0.123 kg and the initial temperature of the Aluminum block was 22°C. The block was placed on a hot plate running at full power. The power rating on the hot plate was found (by looking at the bottom of the apparatus) to be 615 W. Using a stop watch the student times that it takes 1 minute and 24 seconds for the aluminum to reach a temperature of 50°C.



- a) Calculate the efficiency of the hot plate.

Analysis

Efficiency of a Kettle

A student places 0.2 kg of water into a kettle in order to boil it to make a tasty cup of tea. The initial temperature of the water was found to be 24°C . The student reads that the power output of the kettle is 600 W and after some careful lab work discovers that the kettle is 90% efficient. How long would it take the student to boil the water that is in the kettle so that they can enjoy the tea?



Analysis