

58 Energy Consumption: Cold Shower

Investigate

1a. mass of container (g):
mass of container and water (g):

1b. beginning temp or cold water temp ($^{\circ}\text{C}$):
est. to tenths

1c. using digital multimeter
voltage (V):
current (Ω):

$$P = V \cdot I$$

2a. mass of water (g):
cold water temp ($^{\circ}\text{C}$):
resistor power (W):
heating time (sec):
final water temp ($^{\circ}\text{C}$):
est. to tenths

3a. $\Delta Q = m \cdot C \cdot \Delta T$

Change in temp =
final water temp = cold water temp

heat in (joules) mass water specific heat of water = $4.18 \text{ J/g} \cdot ^{\circ}\text{C}$

4a. $E = P \cdot t$

↑ energy (J or Watt-seconds) ↑ power (W or joules/sec)

time (sec)

4b.

5a.
$$\text{efficiency} = \frac{\text{useful energy output}}{\text{energy input}} \times 100\%$$