Results and Discussion

Let V = Heater Voltage (volts), I = Heater Current (amperes), Heat Flow, Q (watts)

T1 = Heater section high temperature (℃)
T2 = Heater section mid temperature (℃)
T3 = Heater section low temperature (℃)
T6 = Cooled section high temperature (℃)
T7 = Cooled section mid temperature (℃)
T8 = Cooled section low temperature (℃)

Length of specimen = 0.030 (m)
Diameter of bar = 0.025 (m)

The necessary data for calculations will be recorded to the table given below

MATERIALS	VOLTS	AMP	Q	T1	T2	T3	T4	T5	T6	T7	T8
	V	I	W	℃	℃	℃	℃	℃	℃	℃	℃
	Thermocouple position			1	2	3	-	-	6	7	8

For each set of readings plot a graph of temperature against thermocouple position. Observe that each temperature profile is a curve and that the gradient at any point on the curve decreases with increasing distance from the heater.

Calculations: Using the equation given below, calculate the thermal conductivity.
Thermal conductivity is defined as:

$$k = \frac{Q\Delta L}{A\Delta T}$$

Conclusion:

1. Search the value of thermal conductivity, *k* for each specimen from appropriate references.
2. Calculate the percentage difference between the theory and experimental value of thermal conductivity, *k*.
3. Explain why there is a difference value between theory and experimental?