

### 3.4A Creating Steady-State Heat Flow Conditions

#### Observations and Data Collection

1. Complete the following Data Table

Data Table 1

Power Supply Voltage: $V_S = 7\text{ V}$				
Power Supply Current: $I_S = 0.7\text{ A}$				
Time (min)	Thermocouple Reading Top of Cylinder $T_{\text{BOTTOM}}\text{ (}^\circ\text{C)}$	Change $T_{\text{BOTTOM}}$	Thermocouple Reading Bottom of Cylinder $T_{\text{TOP}}\text{ (}^\circ\text{C)}$	Temperature Difference Change $T_{\text{TOP}}$
4	57.8	0	56.2	0
8	59.0	1.2	58.0	1.8
12	59.1	0.1	58.3	0.3
16	59.0	-0.1	58.2	-0.1
20	58.8	-0.2	58.1	-0.1
24	58.7	-0.1	57.9	-0.2
28	58.7	0	57.9	0
32	58.6	-0.1	57.8	-0.1
36	58.6	0	57.8	0

2. Complete the following Data Table

Data Table 2

Top Temperature $T_{\text{TOP}}\text{ (}^\circ\text{C)}$	Bottom Temperature $T_{\text{BOTTOM}}\text{ (}^\circ\text{C)}$	Temperature Difference $\Delta T_{\text{(BOTTOM - TOP)}}\text{ (}^\circ\text{C)}$	Input Heat-Flow Rate $Q\text{ (W)}$	Input Heat-Flow Rate $Q\text{ (cal/sec)}$