Name: _____ Class: _____ Date: _____

Measuring Temperature- The Right Device For The Job

Learner Outcomes:

- Explain the operation of technological devices and systems that respond to temperature change (e.g., thermometers, bimetallic strips, thermostatically controlled heating systems).

Key Terms:

Temperature scale	Kelvin scale	Thermocouple
Celcius scale	Bimetallic strip	Thermometer

Background Information: In our daily lives, we encounter a wide range of temperatures. Measuring these temperatures requires that we use a variety of devices because not all devices can measure all temperatures accurately. Some devices detect very high or large changes in temperature, while others detect very low or very small changes in temperature.

Problem: What kinds of devices can be used to detect large and small changes in temperature?

Materials:

thermocouple	lab thermometer	blow dryer
bimetallic strip	mood ring	ice water
fever thermometer	strip thermometer	hot plate
aquarium thermometer	alcohol burner	beaker

Procedure:

Part A: Measuring small amounts of heat

1. Fill the beaker with cold water.

2. Using each of the heat detecting devices, record how each device responds to the cold water temperature.
3. Warm the beaker on the hotplate until the water is not quite boiling.
4. Record how each device responds to changes in the temperature.

Part B: Measuring large amounts of heat

1. Record the response of each heat detecting device to room temperature air.
2. Use the blowdryer to warm the air around the device and record the devices response to this temperature change.
3. Use the alcohol burner to heat the thermocouple, the bimetallic strip and the laboratory thermometer. Record the response of these devices to the change in temperature.

Observations:

Device	Cold Water	Hot water	Room Air	Hot Air	Flame

Analysis:

1. Why couldn't we use all of the devices to detect changes in temperature produced by the alcohol burner flame?

2. Which devices gave a ***quantitative*** measurement of temperature change?

3. Which devices gave a ***qualitative*** measurement of the temperature change?

4. Which devices were able to detect smaller changes in temperature? How do you know?

5. Which devices do you think were most accurate?

6. List each device and give one specific example of when or why it might be used.

Extension:

Visualizing Temperature:

1. Using an infrared camera or infrared goggles, observe heat in your classroom. (You may repeat the experiment).
2. Research how and why infrared technology was developed and how it is used today.