

## **665-0015 (60-045) Digital Thermometer**

**Introduction:** Thermometers in various forms have existed for centuries. The tendency of gases to expand when heated was known to Hero of Alexandria, and Galileo invented a type of thermometer. Temperature scales were not standardized until the first half of the 16<sup>th</sup> century, when Daniel Gabriel Fahrenheit and Anders Celsius invented two scales based on the properties of water. These scales, slightly altered, are still in use today.



Most early thermometers used the expansion of air to obtain a reading. Later, alcohol, water, and mercury were used. Today, thermometers are usually alcohol based or digital.

Certain materials have an interesting electrical property: they will convert temperature into electricity, through a process known as the Seebeck effect. Seebeck made a closed loop of two metals joined at two places. He then applied a temperature difference to the metals. Upon doing so, a compass needle inside the loop deflected. This is because the loop created electricity, which in turn produced a magnetic field. In thermometers, this effect can indicate temperature. As the temperature differential increases, the voltage also increases, and sends a n electric signal to a sensor. The sensor detects this change, and a small microprocessor determines how much the temperature has increased. This value is then displayed on a screen.

**Operation:** Your digital thermometer is rugged and easy to use. Is it also sensitive, displaying temperature to the tenth of a degree. It will display Fahrenheit and Celsius.

A small button on the left hand side of the display turns the unit on and off. Although the thermometer does not consume much power, it is best to turn it off when not in use to conserve the battery.

On the right side of the display is another button. This changes the reading between Celsius and Fahrenheit.

Directly to the bottom of the display is a circular hatch. This can be opened with a straight screwdriver and reveals the battery compartment. The thermometer takes a standard watch battery.

Included in the set is a plastic sheath. This fits over the metal shaft. It has a clip to allow one to attach the thermometer to a beaker or other vessel. The sheath will also protect the thermometer from damage.

**The thermometer is water resistant, but it should not be totally immersed. The electronics may be damaged.**

### **Warranty and Parts:**

We replace all defective or missing parts free of charge. Additional replacement parts may be ordered toll-free. We accept MasterCard, Visa, checks and School P.O.s. All products warranted to be free from defect for 90 days. Does not apply to accident, misuse or normal wear and tear. Intended for children 13 years of age and up. This item is not a toy. It may contain lead or small parts that can be choking hazards. Adult supervision is required.

**623-5011 Thermometer, Celsius:** Armored glass thermometers are totally immersible. Accurate to +/- 1%, spirit filled and 5-3/4" long. Available in Fahrenheit (-40 to +160°F) and Celsius (-10 to +100°C) models

**664-0082 Thermometer Clamp:** Used for supporting thermometers, glass tubes and similar apparatus. Up to 16 mm in diameter and approximately 220 mm long.

**665-0005 Thermometer Clock/Hygrometer:** Do your experiments sometimes require you to note the temperature, time and humidity level in the room at the start and finish of the experiment? If so, this clock featuring the ambient temperature reading and relative humidity can be hung on a wall and all the students in the classroom can make use of the information.

Features:

-30°C to 60°C

Diameter 30 cm

Humidity range 0 to 100% x 2% intervals