612-0010 (15-005) Ball and Ring Apparatus

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 small parts that can be choking hazards. Adult supervision is required.

How to Teach with Ball and Ring Apparatus:

Concepts Taught: Thermal expansion of metals.

Curriculum Fit: Heat Conduction.

Additional Materials Needed:

- Bunsen burner
- Safety goggles
- High temperature safety gloves

Theory:

What is thermal expansion? It can be defined as: *the tendency of matter to increase in volume or pressure when heated.*

Demonstration 1: Thermal Expansion of Metals
Kit Components Needed: Ball and ring apparatus
Additional Materials Needed: Safety goggles, high temperature safety gloves, Bunsen burner

Note: Heat the ball or ring only to the temperature necessary for the demonstration. Overheating will distort the material and this will affect future performance. Please exercise caution as the ball and ring will be very hot and should not be handled again until cool.

Procedure:

1. Teacher should put on proper safety gear (safety goggles) and light a Bunsen burner.
2. Teacher should put on high temperature safety gloves.
3. Hold one rod in each hand. Demonstrate to the students that the ball will easily pass through the ring as they are both at the same temperature.
4. Heat the ball in the Bunsen burner for a short time. Demonstrate that the ball will not pass through the room temperature ring.
5. Now, hold both the ball and ring in the Bunsen burner together (ball should be touching ring). Show that the ball easily passes through the ring again.

May we suggest:

612-0045 Bell Thermal Expansion: Because this demonstrates both linear and spherical expansion, it's an improvement upon the traditional version. Both the rod and gauge have wood handles for safety. At room temperature, the rod fits snugly inside the gauge's slot; both ends fit into either hole. When heated, the rod no longer fits in the slot and fits one - but not both - of the holes. With instructions.

615-4595 Thermoelectricity Demo: The Thermoelectricity Demo is an excellent way to illustrate the Seebeck Effect. When a thermoelectric loop is fashioned from two dissimilar metals and they are connected together at two junctions, and a temperature gradient exists, a voltage or electromotive force (EMF) is induced which is enough to deflect a magnetic compass. Our device features an aluminum strip on the bottom with a bent copper strip on top. There is a depression underneath the copper loop for placement of a small magnetic compass. Also, our device features an attached handle for safety and ease of use.