Ball & Ring Apparatus

33-0630

INSTRUCTIONAL GUIDE

Contents

- Ball and ring

Required for activity:

- Bunsen Burner (14-5820)
  or
- Portable Mirco Burner (C5-1005)

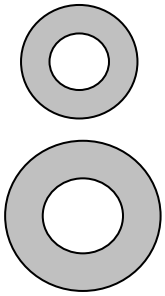
Instructions

Hold the insulating handles. Show that the ball fits easily through the ring.

Heat the ball in a flame. As it heats, ask students to predict whether it will fit through the ring. Show that it has expanded and does not fit. Dip the ball in water to cool it. Heat the ring, and ask students to predict if the cool ball will fit through the heated ring. Show that it does fit.

Introduction

Most students will accurately predict that thermal expansion will cause the heated ball not to fit through the cool ring. The ball expands due to increased molecular motion.



Many students will predict that the cool ball will not fit through the heated ring. In fact, it does. Both the inner and outer diameters of the ring expand. Think about enlarging a photograph. See the diagram. Another way to explain it is to realize that, for the hole to get smaller, the metal atoms on the inner wall would have to get closer together. When heated, they can only get farther apart, enlarging the hole.

Related Products

Compound Bar Set (P6-7080) Now take your thermal expansion labs a step further with our set of four different compound bars or bimetallic strips.

Thermal Conductivity Bars (P6-7090) Study heat conductivity in different metals. Observe the temperature gradients along the metal bars, and watch them evolve. Rate of conduction of heat can be measured by the mounted strip thermometers.

Compound Bar (P6-7070) Thin strips of two different metals are laminated together in this simple demonstration, also known as a Bimetallic Strip. Demonstrate thermal expansion.