TEACHERS GUIDE

5 ROD HEAT CONDUCTOMETER

ITEM # 3223-00

CHEMISTRY - PROPERTIES OF MATTER

Students make conclusions about which metals conduct heat best by placing the center of this device over the flame of a Bunsen burner. Device has one rod each of aluminum, brass, iron, copper, and steel, radiating from a circular center. At the end of each rod is a cavity to hold paraffin wax. Wax will melt to indicate the rods that conduct heat best. Insulated, 12.5 mm handle allows safe handling. Overall length approximately 32 cm.

Materials

- 5 Task sheets
- 5 Bunsen Burners
- 5 conductometers
- 25 pieces of paraffin wax

Note: Task sheets can be 3x5 cards, with one task on each. Tasks could be: find what material makes the best cookware, explain the advantage of iron in insulating a room from an explosion, etc.

Goals & Objectives

Students will:

- discover which metals conduct heat most efficiently.
- use an authentic need to drive experimentation.
- apply findings from the experiment to invent a solution to the need.

Assessment

Task Sheet Questions/Answers

1 **Potential answers to task sheet possibilities:**

a **Best cookware:**
Copper or aluminum causes the wax to melt * earliest, so either could be good to cook with. Since copper is more expensive, and soft, it may be best to use aluminum, but both would heat easily.

b **Insulator:**
The wax should melt slowest with the stainless steel * rod, therefore it must conduct heat least and would insulate well. Iron is the next slowest, so it would work too, and is more solid so could be the best choice.

Activities

1 Organize students into 5 groups.

2 Place one each of a task sheet, Bunsen burner, conductometer, and 5 wax pieces, in front of each group. (Teacher can light the Bunsen burner at this time.)

3 Ask students to discuss within their group how to solve the task on their task sheet.

4 Take any answer that leans toward comparing metals' reaction to heat exposure.

5 Point out the conductometer, and that it offers 5 different kinds of metals.

6 Ask students to look at the materials in front of them as predict how the conductometer can be used to help them solve their task.

7 Students with correct answers will say something like: place paraffin wax into each rod; hold the center of the conductometer over the lit Bunsen burner; note the sequence of which rod conducts heat to the wax first, shown by which wax melts first; use this information to answer their task.

Note

It is always best to DO an experiment ahead of time to be able to best present it to the class.

For Student Assessment use:

- Discussion
- Group work
- Answers to task sheets

