

615-4115 (10-103) Lamp Board Rheostat



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.

Description:

Learning the basics of electricity doesn't get much more basic than this. Experiment with series and parallel circuits by studying the brightness and intensity of light bulbs. Clear plastic base mounted with 5 lamp receptacles, 5 sets of binding posts.

Five 1.5 V bulbs included. Do not exceed 1.5 V.

How to Teach with Lamp board Rheostat 5 Bulb Socket:

Concepts Taught: Electric Circuits

Curriculum Fit: Electricity

Grades 6-8 and up.

Theory:

What is an electric current? *It can be defined as:* a stream of electrons moving through a conductor.

What is an ampere? *It can be defined as:* unit of electric current (one coulomb per second).

What is an electric circuit? *It can be defined as:* closed path of conductors through which electrons can flow.

What is a series circuit? *It can be defined as:* an electric circuit arranged so that the same electric current flows through all of the components of the circuit.

What is a parallel circuit? *It can be defined as:* an electric circuit so arranged that there are several parallel paths for electric current to flow from one point to another.

What is a rheostat? *It can be defined as:* a variable resistor used to control the amount of current in an electric circuit.

Additional Materials Needed:

- DC clear light bulbs in varying voltages
- **20-045 Hand Generator** (use minimum 3.7V DC clear light bulbs (not included) when using hand generator)

Caution: Do not exceed 6 V DC in these experiments.

Experiment: Parallel Circuit**Procedure:**

- Screw a clear light bulb into each of the five sockets on the lamp board rheostat.
- Connect the black and red leads from the hand generator or 1.5V battery to the binding posts of the first bulb.
- Crank the handle of the hand generator and observe how the bulbs light up.

Experiment: Series Circuit**Procedure:**

- Screw a clear light bulb into each of the five sockets on the lamp board rheostat.
 - Remove the binding posts from the first (top only), third (top and bottom) and fifth positions (bottom only) of the lamp board rheostat.
 - Open the arms of the first, third (top and bottom) and fifth positions.
 - Connect the black lead from the hand generator or 1.5V battery to metal arm closest to bulb position # 1 and the red lead to the metal arm near the open arm of position #5.
 - Crank the handle of the hand generator and observe how the bulbs light up.
 - Compare the brightness of the parallel circuit bulbs to the brightness observed in the series circuit experiment. Write your observations on the lines below.
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Discussion:

- All bulbs need to be operational when a series circuit is connected.
- With a parallel circuit, the bulbs act independently of one another.
- Power = Voltage × Current = $\frac{V^2}{R}$

Therefore, the smaller a given resistance, the greater the power that will be drawn from a constant voltage source.