

## 32930 Series-Parallel Lampboard

### **Purpose:**

To permit investigation of basic electrical principles through the analysis of series and parallel circuits.

### **Materials Needed, Not Included:**

One (1) Lantern Battery 6V Two (2) Miniature Bulbs, 6V

One (1) Digital/Analog Multi meter Alligator Clip Leads

**WARNINGS: Use only a six volt lantern battery or a shock may occur. Use only copper, copper clad or aluminum wire marked CO/ALR with this device.**

### **Procedure:**

#### **Series**

Be sure the colored binding posts are facing towards you and insert a bulb into each of the receptacles. Loosen the middle negative (black) binding post and swing the metal switch away from the post and insure all other binding posts are tight. This will create one conducting pathway starting at the middle negative (black) binding post and proceeding clockwise to the left through the copper wire, through the lamp socket, through the copper wire, around the end negative (black) binding post through the large metal switch, around the left thumbnut, through the copper wire, through the lamp socket, through the copper wire, around the right thumbnut, through the remaining large metal switch to the positive (red) binding post. Using alligator clip leads, connect the positive terminal of the battery to the positive (red) binding post and the negative terminal of the battery to the middle negative (black) binding post. Swinging away either of the large metal switches will break the circuit and neither of the light bulbs will operate.

#### **Parallel**

Be sure the light bulbs are secure in both sockets and the colored binding posts are facing towards you. Loosen the middle negative (black) binding knob and swing the small metal switch closed. Re-tighten the binding post.

Two separate conducting pathways are formed by this connection. The first pathway is from the positive (red) binding post through the middle negative (black) binding post, the lamp socket and through the long metal switch, around the right thumbnut, through the copper wire, through the lamp socket, through the copper wire, around the left thumbnut and through the remaining large metal switch to the end negative (black) binding post.

Using alligator clip leads, connect the positive terminal of the battery to the positive (red) binding post and the battery's negative terminal to the end negative (black) binding post. Swinging away either of the metal switches by loosening either the thumbnuts or binding posts will break the circuit. However, the light bulb in the first circuit will remain lit because there is still a complete circuit.

### **Time Allocation:**

No prior assembly is required for this product. Individual experiment times will vary depending on needs of students and methods of instruction, but normally will not exceed one class period.

### **Feedback:**

If you have a question, a comment, or a suggestion that would improve this product, you may call our toll free number.