

# Electric Circuits

## Assembly Instructions

The Electric Circuits Set is a powerful tool for understanding how electricity works in circuits. Students are able to perform experiments that explore the concepts of voltage, current and resistance in simple circuits. The design of the board and accessories allows the students to connect circuits that clearly match their diagrams.

### Parts Checklist

The following items are provided with the Electric Circuits:

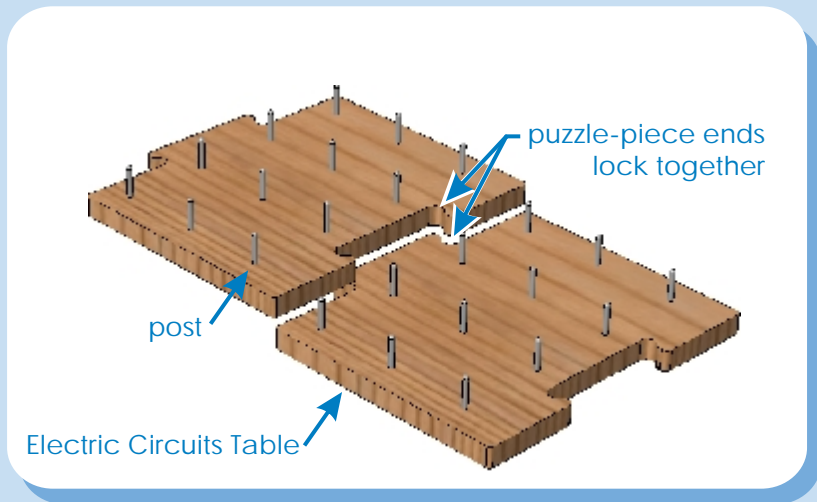
- Electric Circuits Table
- potentiometer
- battery holders (2) and extra wires
- light bulbs (6)
- light bulb holders (3)
- green short-length wires (6)
- blue medium-length wires (2)
- brown long-length wires (2)
- green 5-ohm resistors (2)
- blue 10-ohm resistor
- red 20-ohm resistor
- knife switches (2)

In addition, you will need the following:

- D battery (1.5 volt)
- DC meter (optional)

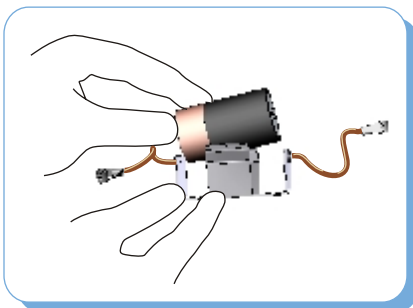
### Understanding the Table

The table is a platform for securely assembling electric circuits. It consists of a solid base with 12 posts. The posts are used in making connections between different parts of the circuit. The posts are not connected to each other until students 'wire' them on top of the board. There is no hidden wiring in the table. The table has 'puzzle-piece' ends to allow more than one table to be connected together for making larger circuits. The Ripcord Generator (sold separately) can be attached the same way.

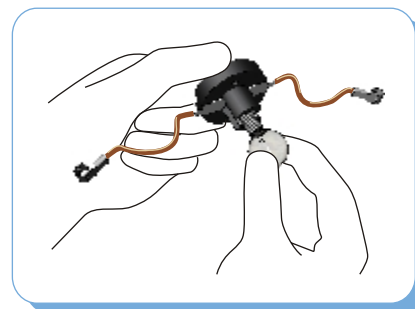


### Assembling the Components

Place D batteries (1.5 volts) into the battery holders.



Place a light bulb into each bulb holder.



Assembly instructions continue on page 2.

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## How to Make Connections

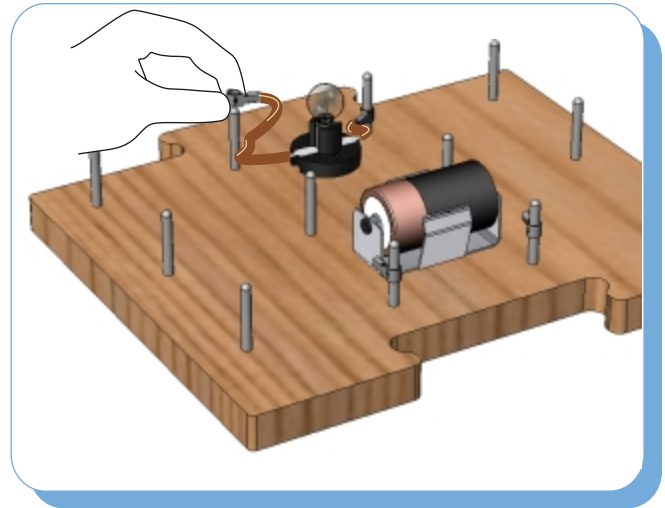
### Connecting wires to posts

Each wire has a circular connector at both ends called a hoop connector. To add a wire to the board, place the hoop around the post and push down on the hoop. If you need to add more wires to the post, simply push the first wire down the post to make space for another hoop. You can add up to 4 hoops to a post.

*Solid contact is made at any position on the post. It is not necessary to slide every wire to the bottom of the post.*

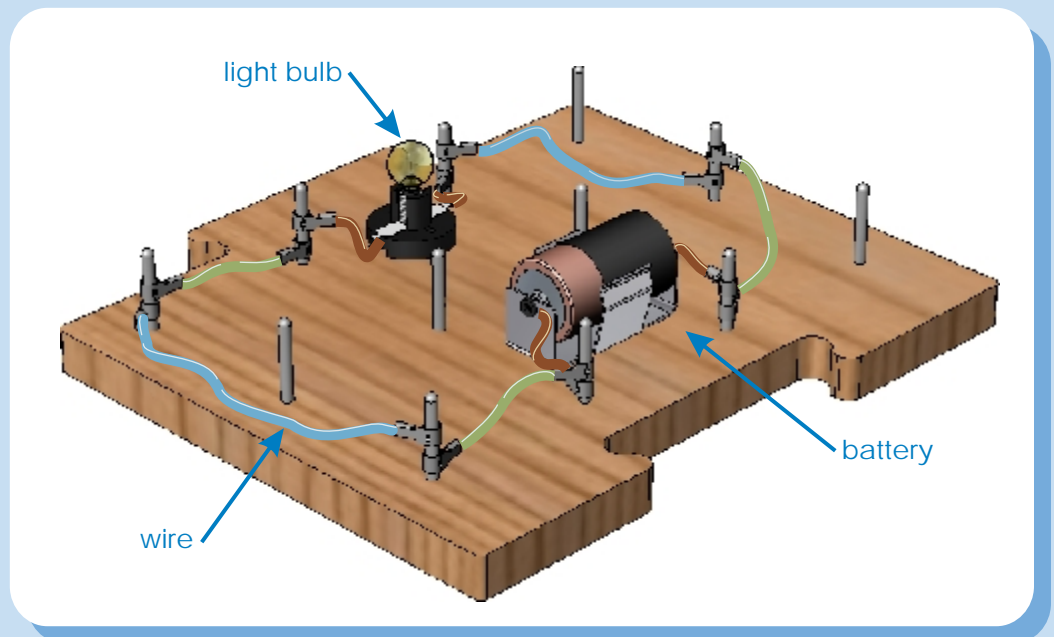
### Connecting circuit elements to posts

A circuit element is any item that uses or affects electricity in a circuit. This includes batteries, light bulbs, resistors and switches. Each circuit element that comes with the Electric Circuits Set has the same type of hoop connectors as the wires. To connect a circuit element to a post, just place the hoop on the post and push down.



## A Sample Circuit

A circuit is made when wires and elements are connected together, making a path for electricity. At right is an example of a simple circuit consisting of a battery, a light bulb and some wires.



## Avoiding Short Circuits

Circuits should always include a resistor. A resistor is a device like a light bulb, motor, or one of the included resistors that provides substantial resistance to the flow of electricity in a circuit. A wire alone provides very little resistance, and is not considered a resistor. A circuit without a resistor, or with a branch that bypasses a resistor, is called a short circuit. A short circuit causes unsafe heating of connecting wires, batteries and battery holders, which could result in burns and irreparable damage to the equipment. Short circuits should be avoided at all times.

For technical assistance, please call 866.588.6951.