How to Build a Simple Electrical Circuit

This quick guide will help you assemble a basic battery-and-bulb circuit using the same components featured in the *Smart Energy Academy* classroom activity, **Who Turned Out the Lights?**

This is a safe, low-voltage activity perfect for primary school students learning about how electricity flows and how energy is transferred.

What You Will Need

You can use your school's science resources or source inexpensive components from suppliers such as Jaycar, Officeworks, Kmart, or online education suppliers.

Basic Circuit Kit:

- **1 × AA battery** (1.5V)
- **1 × battery holder** (optional but recommended)
- **2 × insulated wires** with crocodile clips (red and black ideal)
- **1 × small light bulb** (1.5V–3V recommended)
- **1 × bulb holder**

Optional (but helpful):

- Small on/off switch
- Extra wires for longer circuits
- LED (with resistor)

What Are We Building?

A **simple electrical circuit** that allows electricity to flow from the battery → through the wires → into the bulb → and back to the battery.

When the circuit is complete, the bulb lights up, showing that energy is being transferred and transformed.

Step-by-step instructions

1. Prepare your components

Lay out the battery, bulb holder, bulb, and wires on a desk.

2. Insert the bulb

Place the small bulb into the bulb holder. Make sure it is sitting firmly.

3. Connect the first wire

Attach one end of a crocodile-clip wire to **one side of the bulb holder**.

Clip the other end to the **positive (+) end of the AA battery** or battery holder.

4. Connect the second wire

Attach the second wire to the **other side of the bulb holder**.

Clip the remaining end to the **negative (–) end of the AA battery**.

5. Check your circuit

The bulb should now light up.

If not:

- Make sure the wires are clipped to metal parts
- Ensure the bulb is tightly seated
- Check that the battery has charge
- Ensure the clips are not touching each other

How it works

Electricity flows in a **loop**, called a **circuit**.
For the bulb to light:

- The **circuit must be complete**
- The **battery** supplies electrical energy
- The **wires** carry the electric charge
- The **bulb** transforms the electrical energy into light (and a small amount of heat)

If the loop is broken anywhere, the light goes out.

Safety tips

Low-voltage circuits like this are very safe, but always follow these guidelines:

- Only use **1.5V–3V bulbs and batteries**
- Do **not** connect batteries directly together to increase voltage
- Ensure wires have **insulated plastic covering**
- Teachers should handle battery changes
- Do not allow students to place wires near mouths or eyes
- Pack away components after use

Where to Source Components

Affordable kits can be found at:

- **Jaycar**
- **Officeworks**
- **Kmart** (basic science kits)
- **Amazon Australia**
- **School science supply companies** such as Modern Teaching Aids

Try These Extensions

These optional challenges extend learning for Years 3–6:

1. Add a switch

Place a switch between one of the wires and the battery.
Students can now *control* the flow of electricity.

2. Test different bulbs

Compare brightness between incandescent bulbs and LEDs.

3. Build a series circuit

Add a second bulb in line and observe what happens.

4. Explore energy transfer

Ask: *Does the bulb get warm? Why?*