Let's start by taking a look at the parts in our kits:

motor

wires

breadboard

battery clip

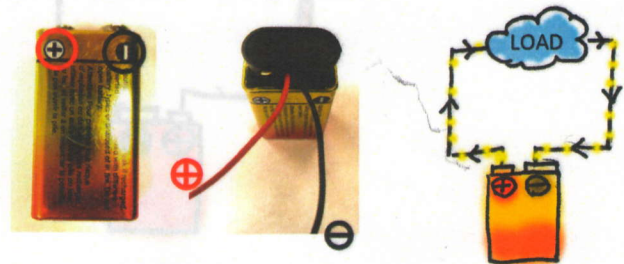battery

switches

lightbulb
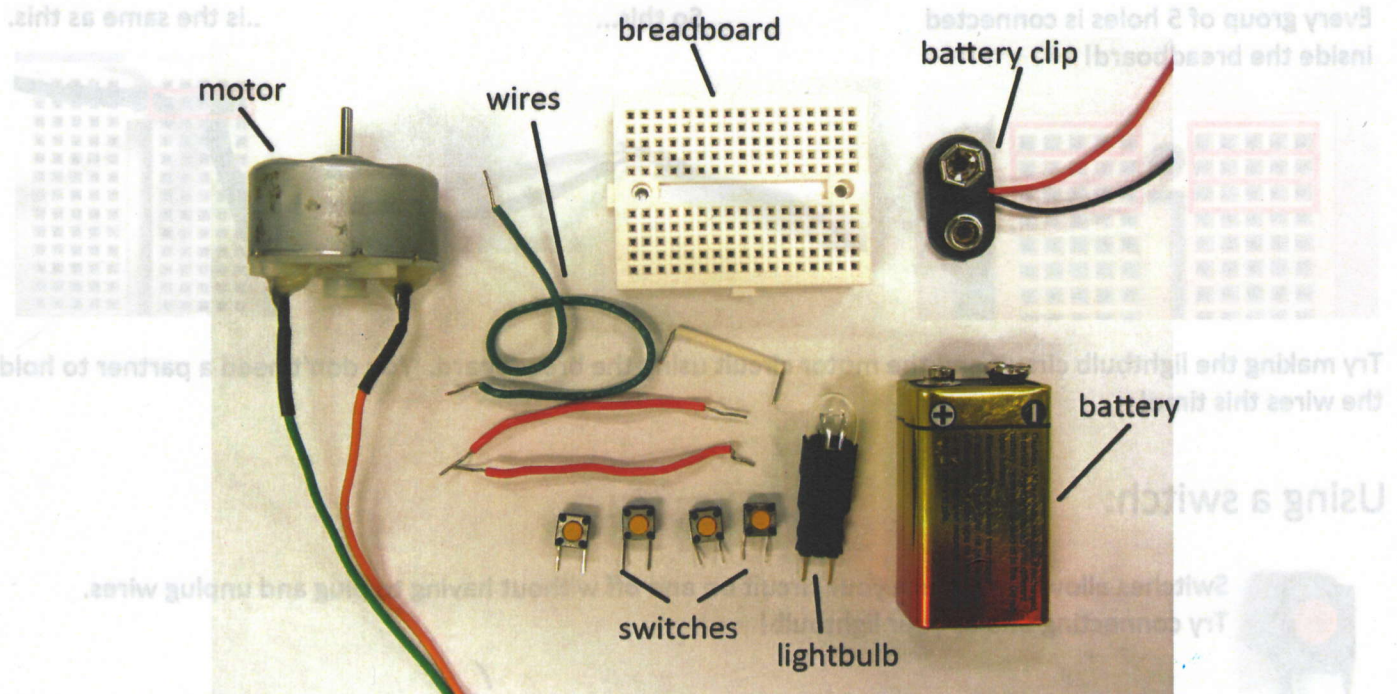
The circuits we're building today have 2 main parts:
1. A power source: this provides some electrical energy.
2. A load: this is the thing that takes that energy, and uses it to do something useful.

Let's take a look at our power source, the **battery**:
It has two poles: a positive (+) pole and a negative (−) pole. When you connect your battery to a circuit, the electricity comes out of the (+) end, through the load, and back into the battery through the (−) end.

LOAD

SAFETY: IMPORTANT!
Never connect a battery to another battery, or to itself with no load. This is called a **short circuit**, where the electrical current comes out of the (+) pole and straight into the (−) pole. This can permanently damage your battery.

## Let's try making our first circuit!
1. Find a partner (probably the person sitting next to you).
2. One person holds the wires from their battery.
3. The other person holds their lightbulb.
4. Carefully touch the two battery wires to the ends of the light bulb (see illustration)
5. Congratulations! You have just made your first circuit.
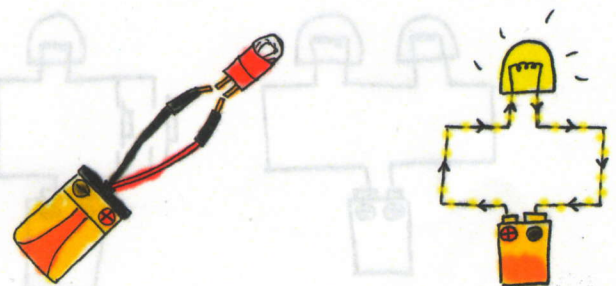
Now, try to get the motor running with your battery. Can you get the motor to run in both directions?

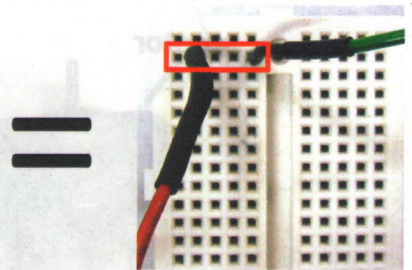# The breadboard is useful for connecting wires.

Every group of 5 holes is connected inside the breadboard!
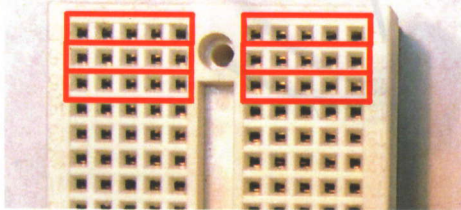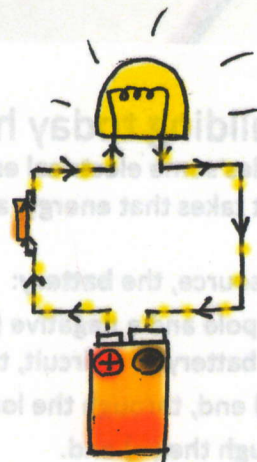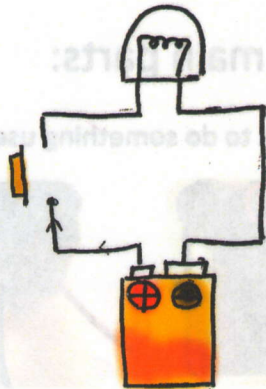

So this...

..is the same as this.

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Try making the lightbulb circuit and the motor circuit using the breadboard. You don't need a partner to hold the wires this time!

Using a switch:

Switches allow you to turn your circuit on and off without having to plug and unplug wires. Try connecting one to your lightbulb!

Does it matter where you put the switch in your circuit?

Now you're ready to start building your own circuits!

Just remember the safety rule, and think about where you want your electrical energy to flow.
To start off, here are some ideas: