Chapter Six: Electricity

- 6.1 Charge and Electric Circuits
- 6.2 Current and Voltage
- 6.3 Resistance and Ohm's Law - Types of Circuits

Chapter 6.2 Learning Goals

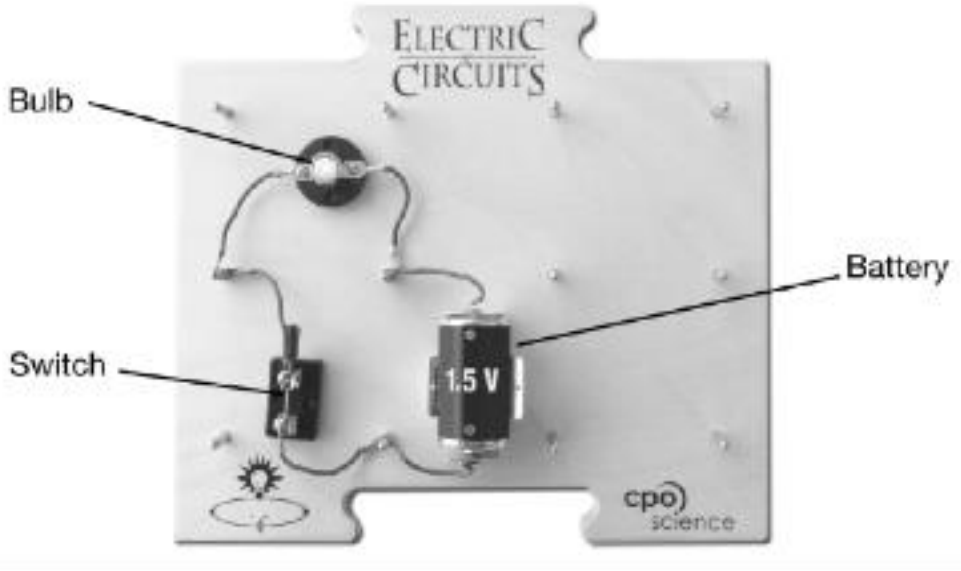
- Explain how current flows in an electric circuit.
- Define voltage and describe how it is measured.
- Discuss the function of a battery in an electric circuit.

Investigation 16A

Electricity

- **Key Question:**

  How do you measure voltage and current in electric circuits?



6.2 Current and voltage

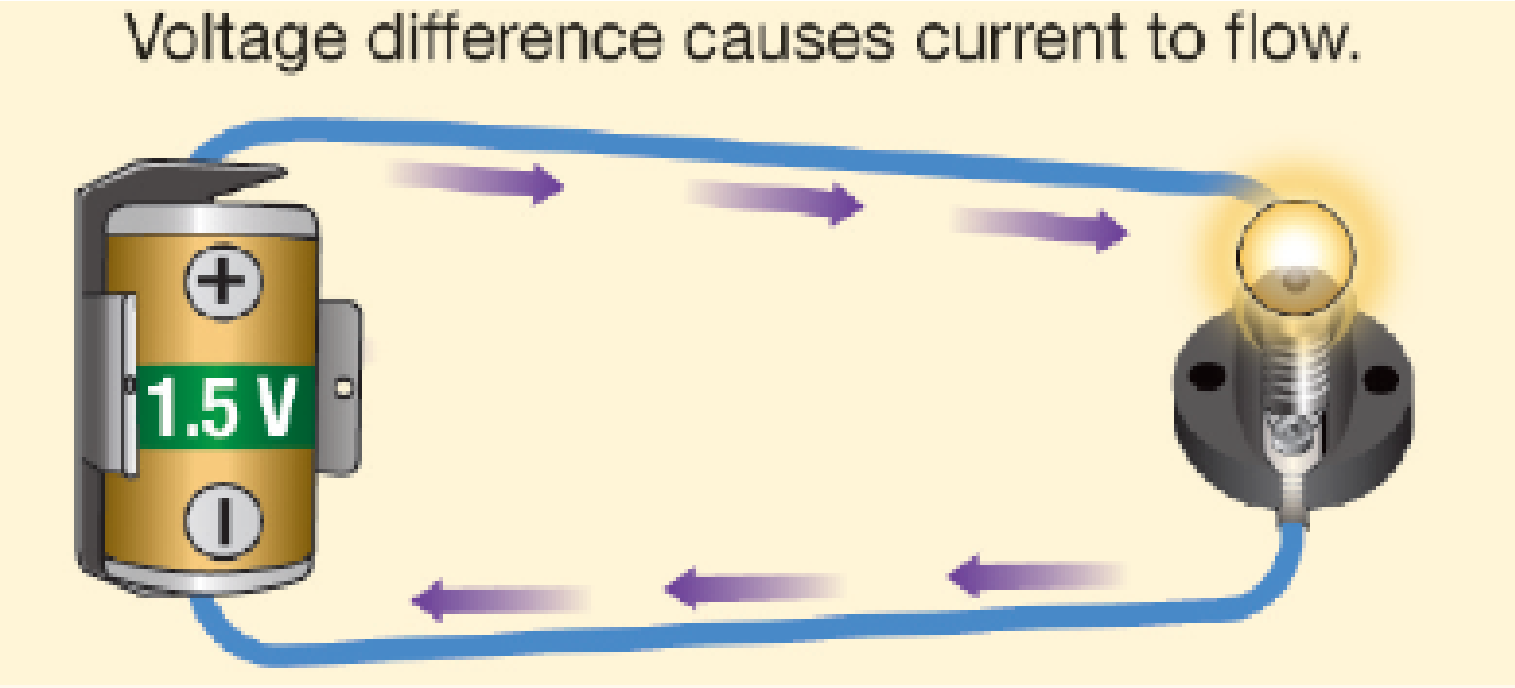
- Electric current is measured in units called amperes, or amps (A) for short.
- One amp is a flow of a certain quantity of electricity in one second.
- The amount of electric current entering a circuit always equals the amount exiting the circuit

6.2 Voltage

- Voltage is a measure of electric potential energy, just like height is a measure of gravitational potential energy.
- Voltage is measured in volts (V).
- A voltage difference of 1 volt means 1 amp of current does 1 joule of work in 1 second.

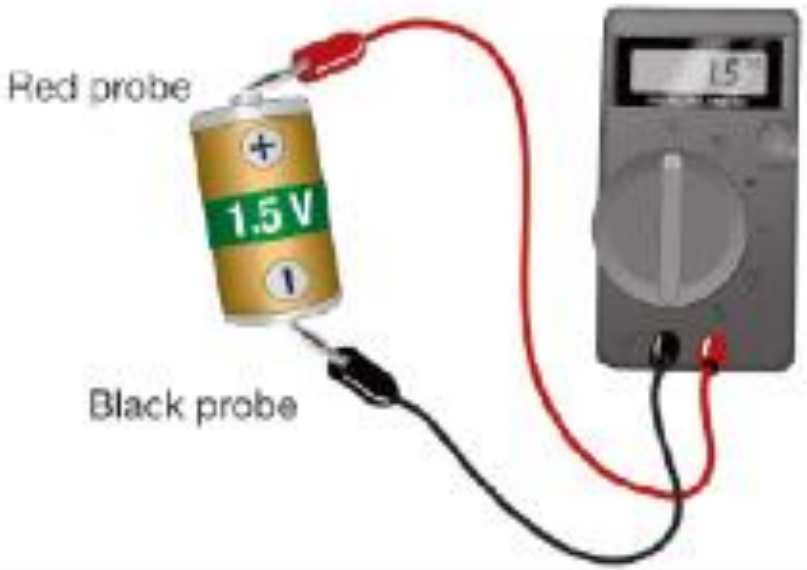
6.2 Voltage

- **A <u>difference</u> in voltage provides the energy that causes current to flow.**



6.2 Voltage

- A useful meter is a multimeter, which
- can measure voltage or current, and sometimes resistance.
- To measure voltage, the meter's probes are touched to two places in a circuit or across a battery.



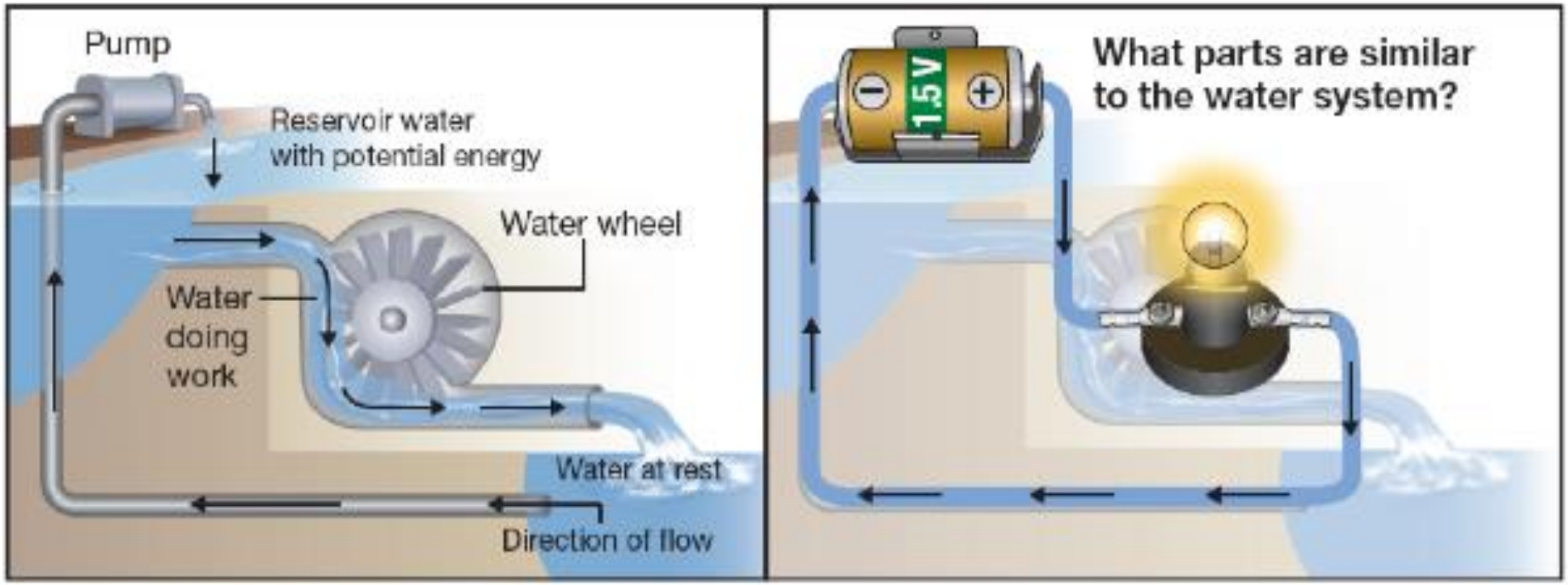
6.2 Batteries

- A battery uses stored chemical energy to create the voltage difference.
- Three 1.5-volt batteries can be stacked to make a total voltage of 4.5 volts in a flashlight.

6.2 Batteries

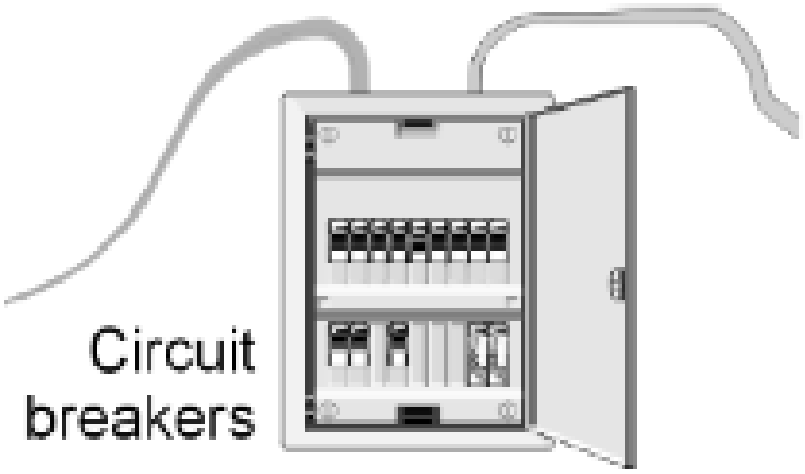
- **A pump is like a battery because it brings water from a position of low energy to high energy.**

Water/Electric Circuit Analogy



6.2 Measuring current

- If you want to measure current you must force the current to pass through the meter.
- Multimeters can measure two types of current: alternating current (AC) and direct current (DC).

6.2 Measuring current

- **Circuit breakers and fuses are two kinds of devices that protect circuits from too much current by making a break that stops the current.**