



Chapter Sixteen: Electricity

- **16.1 Charge and Electric Circuits**
- **16.2 Current and Voltage**
- **16.3 Resistance and Ohm's Law**
- **16.4 Types of Circuits**



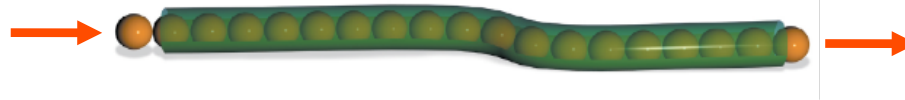
Chapter 16.2 Learning Goals

- 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.



16.2 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.

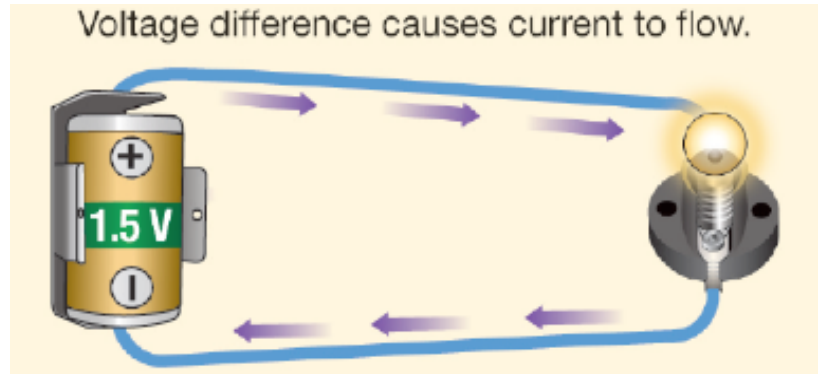


16.2 Voltage

- **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.**

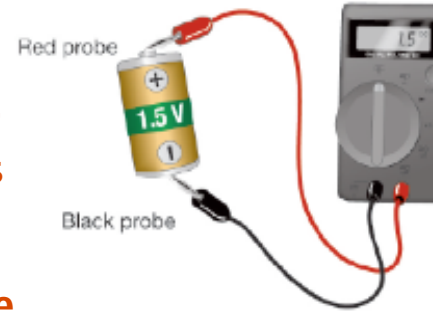
16.2 Voltage

- A difference in voltage provides the energy that causes current to flow.



16.2 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.



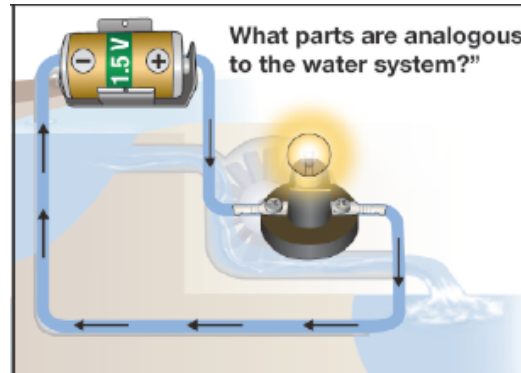
16.2 Batteries



- 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.

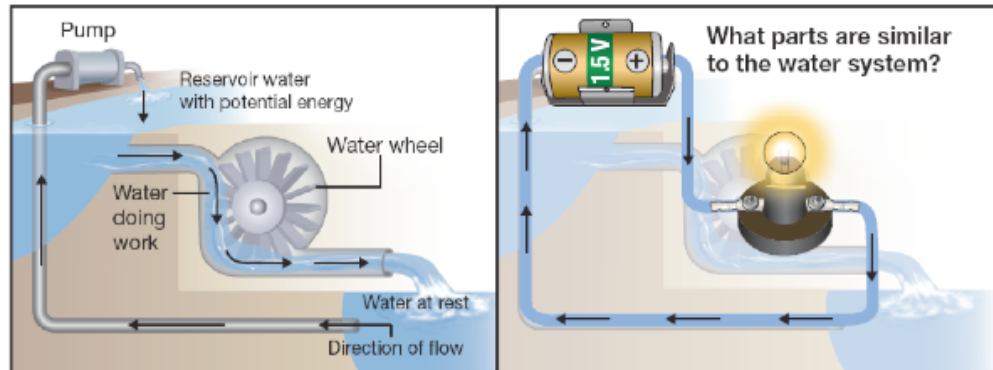
16.2 Batteries

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





Water/Electric Circuit Analogy





16.2 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).

16.2 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.**

