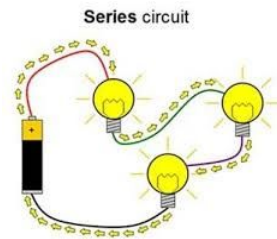


## Study Guide for Electricity Final Unit Test

- When you create a **compound battery** by adding a 1.5V battery to a 1.5V battery in a **simple series circuit** the bulb gets **brighter**.
- A **conductor** is a material with **freely moving electrons** that lets electricity pass through it.
  - Examples of conductors are silver and copper.
- An **insulator** (nonconductor) is a material that **does NOT have freely** moving electrons and does NOT let electricity pass through it.
  - Examples of insulators are rubber and glass.
- Capacitors are used in circuits to store electric charge.
- **Longer wires** have **more resistance** than shorter wires and thin wires have more resistance than thick wires.
  - A 24 gauge wire that is 1 kilometer long has more resistance than a 24 gauge wire that is .3 kilometers long.
- **Thicker wires** have **less resistance** because there is a **greater area for the electrons to flow**.
- Longer wires have more resistance because the path for the electricity is longer.
- A light bulb will turn on when you **close the switch in a series circuit** because closing the switch **completes the circuit**.
- If one bulb burns out in a **series circuit** with two light bulbs, the other bulb will also go out because the **flow of electrons was stopped**.
- If one of the bulbs burns out in a **parallel circuit** with two light bulbs, the other light bulb will stay lit because the **flow of electrons has another path**.
- When you add a fan to a circuit with a lightbulb and a 1.5 V battery, the light will get dimmer because there is an additional **resistance** to the flow of electrons.
- If you have two 1.5V batteries in a simple circuit the voltmeter will read 3.0 V because you have created a **compound battery** and the electricity flows through both batteries.

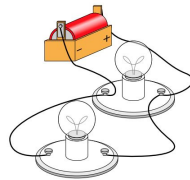
- The **Law of Conservation of Energy** states that energy cannot be created or destroyed.
  - Examples of the Law of Conservation of Energy are **electrical energy transformed into thermal energy, conduction, and radiation**
- Both **halogen** and **incandescent** light bulbs have a **filament**. **Fluorescent** light bulbs only have **gas vapor**.
- An **Energy Star Label** means that a product meets **certain energy efficiency standards**.
- The **electrolyte** in a **dry cell battery is a paste** and the electrolyte in a **wet cell battery is liquid**.
- **Alessandro Volta** built the **first battery**.
- 400 years ago, **Galileo** was the first scientist to **measure temperature**.
- The **first thermometer** was invented in 1701 by **Olaus Roemer**.
- **Ben Franklin** invented the **lightning rod** and proved that lightning is electricity.
- A **voltmeter** measures volts
- Cameras need a **capacitor** to have a flash to **store power** for the burst of energy needed for a flash.
- The **melting point** of ice is **32 degrees Fahrenheit**. The **boiling point** of water is **212 degrees Fahrenheit**.
- A **dielectric plate** is used as an **electrical insulator**. It does NOT conduct electricity.
- **Batteries** have **positive and negative terminals**.
- **Conductors** of electricity have **freely moving electrons**.
- **Static electricity** is caused by the **build up of electrical charge** on an object.

## NEED TO KNOW DIAGRAMS/SYMBOLS



(Figure A)

- Figure a is a **series circuit**. There is **only one path** for the flow of electric current.



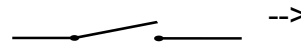
(Figure B)

- Figure B is a **parallel circuit**. There is **more than one** path for electric current.

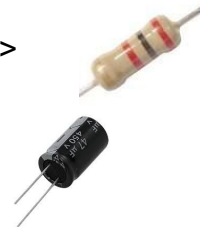
- To the right is a **resistor** which **restricts the flow of electricity**. -->

- To the right is a **capacitor** which **stores electric charge**. -->

- To the right is a symbol for an **open switch**.

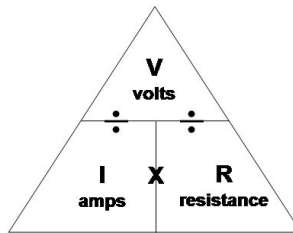


- To the right is a symbol for a **closed switch**. -->



### **NEED TO KNOW VOCABULARY:**

- **Ampere:** Unit of electric current
- **Battery:** A device containing an electric cell or a series of electric cells storing energy that can be converted into electrical power
- **Chemical Energy:** The energy stored in the bonds between atoms in molecules that can be transformed into types of other energy
- **Circuit:** A continuous conducting path for current
- **Energy Transformation:** A change of energy from one form to another
- **Electricity:** the flow of electrons
- **Incandescence:** Emission of light caused by heating
- **Kinetic Energy:** The energy of motion
- **Ohm:** Unit of resistance
- **Schematic:** A diagram that represents an electric circuit using symbols
- **Volt:** Unit of electric potential
- **Ohm's Law:** The voltage across an electric device is directly proportional to the current through it and to the device's electrical resistance.



$$\text{Voltage} = \text{Amps} \times \text{Current}$$

$$\text{Current} = \text{Voltage} \div \text{Resistance}$$

$$\text{Resistance} = \text{Voltage} \div \text{Current}$$