It’s Electrifying! Webquest

**PART I: INTRODUCTION TO ELECTRICITY**

***[Use for Parts I-III](https://www.nde-ed.org/EducationResources/HighSchool/Electricity/electricityintrohtm)***

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1. What is electricity?
2. The first recorded references to static electricity and lightning were made over 2,500 years ago by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. What was most likely the source of the word “electricity”?
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_ are natural forces that are very closely related.

**PART II: BASICS OF ELECTRICITY (***On the right hand side of the website, click on #8 “The Valence Shell”)*

1. Which subatomic particle is responsible for creating an electrical current? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. In terms of electrons, how are conductors different from insulators?

**PART III: CONDUCTORS AND INSULATORS (***Click on #13 “Conductors and Insulators”)*

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is considered to be a good conductor.
2. Which type of materials are considered to be good conductors? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_are also used as conductors.
4. Why is copper the most popular material used for wires? (2 reasons) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. Materials that do not let electrons flow very easily from one atom to another are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Some common insulator materials are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**PART IV: WHAT IS ELECTRICITY?**

***Use for Parts IV-XI***



<http://www.explainthatstuff.com/electricity.html>

1. According to this site, what is electricity?
2. The 2 types of electricity are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. Static electricity occurs when electricity \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. Current electricity occurs when electricity \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**PART V: STATIC ELECTRICITY**

1. Static electricity often happens when \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Rubbing a balloon against a jumpsuit gives it an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. How does walking across a rug produce an electric shock?
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a natural example of static electricity.
5. What causes a bolt of lightning?

**PART VI: HOW STATIC ELECTRICITY WORKS**

1. Electricity is caused by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the tiny particles that "orbit" around \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Electrons have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ charge.
3. Why don’t atoms typically have an overall electrical charge?
4. Why would a balloon stick to you after it is rubbed against wool? *(click the static electricity link)*

**PART VII: CURRENT ELECTRICITY**

1. What causes an electric current?
2. Electricity stored in a battery is an example of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy.
3. What causes a battery to “die” (“run flat”)?

**PART VIII: ELECTRIC CIRCUITS**

1. What is required for an electric current to happen? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What is a circuit? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. The components of a simple circuit include a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ linked together by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. What happens when you turn the switch ON? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. What happen if there is a break anywhere in the circuit? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. What happens when you turn the switch OFF? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. A switch is sometimes called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**PART IX: HOW ELECTRICTY MOVES IN A CIRCUIT**

1. What makes copper a conductor and rubber an insulator?
2. Conductors have \_\_\_\_\_\_\_\_\_\_\_ conductance &\_\_\_\_\_\_\_\_\_\_\_resistance; insulators have \_\_\_\_\_\_\_\_\_\_\_ conductance & \_\_\_\_\_\_\_\_\_\_\_ resistance.
3. Inside the box, draw and label the diagram of an electric circuit.

**PART X: ELECTROMAGNETISM**

1. What is an electromagnet?
2. How do scrapyards use electromagnets?
3. Electromagnets show that electricity can make \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. An \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is a machine that turns electricity into mechanical energy.

**PART XI: MEASURING ELECTRICTY**

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ describes the electrical force that makes electricity move through a wire; measured in \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. More current flows through batteries with higher \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (Example: a 12-volt car battery produces more current than a 1.5-volt flashlight battery.)
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ does not go anywhere or "flow through" things.
4. An \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, a steady flow of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is what moves through the wire in a circuit.
5. Electrical current is measured in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_).
6. Together, voltage and current give you \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
7. Electric power is measured in units called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (1 watt uses 1 \_\_\_\_\_\_\_\_\_\_\_\_ of energy each \_\_\_\_\_\_\_\_\_\_.)
8. The standard unit used to describe how much power an electric appliance uses over time for is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (\_\_\_\_\_\_\_\_\_\_\_\_\_); 1 kilowatt hour is equal to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_joules (J) of energy.