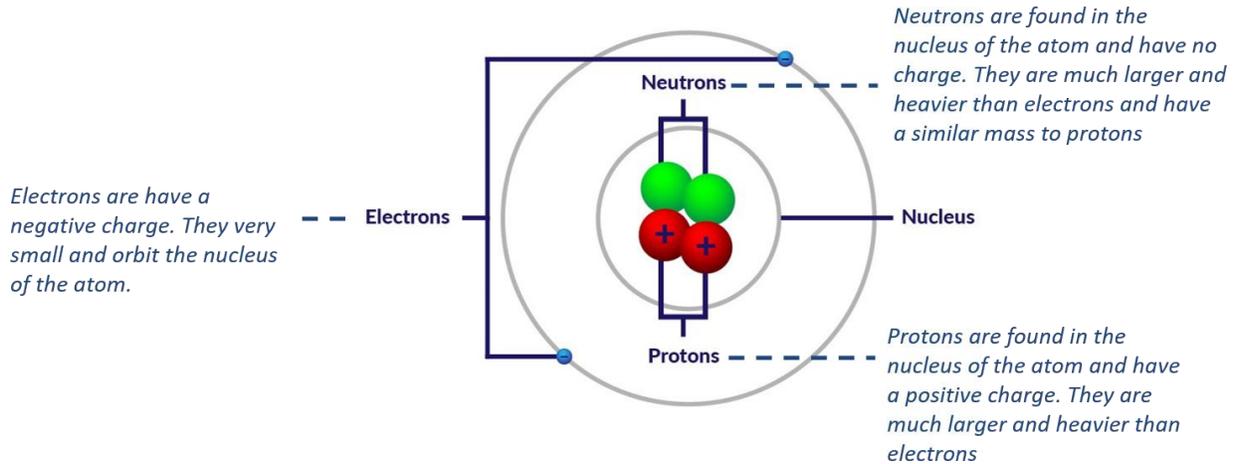


# Electrical Charge

## Guided Notes – Student Edition

### Reviewing Atoms and Charged Particles

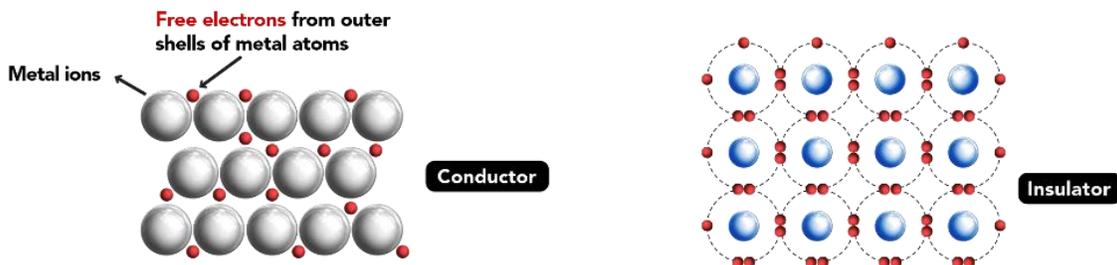
All matter is made up of tiny particles called \_\_\_\_\_ that are too small to be seen with the naked eye. Atoms contain three different types of subatomic particles, summarized in the diagram below.



In the atom there are equal numbers of \_\_\_\_\_ and \_\_\_\_\_. This means that the atom has no overall electrical charge, since the positively charged protons cancel out (\_\_\_\_\_) the effects of the negatively charged electrons. When an atom loses or gains electrons, this upsets the balance of charges and it forms an \_\_\_\_\_.

- Losing one or more electrons causes an atom to form a \_\_\_\_\_ charged ion called a cation.
- Gaining one or more electrons causes an atom to form a \_\_\_\_\_ charged ion called an anion.

Electrons can also exist independently from atoms, these negatively charged particles can travel freely in substances such as \_\_\_\_\_. These substances which allow the transfer of electrons are called \_\_\_\_\_, while those which do not allow electrons to travel through them are called \_\_\_\_\_.



### What is Electricity?

Electricity is a form of energy which occurs because of charged particles (\_\_\_\_\_ and \_\_\_\_\_). Electricity can build up in one place or can flow from one place to another. There are two main forms of electricity:

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## Current Electricity

Involves electrical energy which travels in a \_\_\_\_\_ (see lesson 8-2).

## Static Electricity

When electrons gather in one place i.e., are stationary, usually on the \_\_\_\_\_ of an object.

### **Positive and Negative**

Static electricity occurs when materials which are \_\_\_\_\_ are rubbed together and some of the electrons \_\_\_\_\_ from one material to the other. The material that gains electrons will have a \_\_\_\_\_ charge due to having additional electrons which cannot be balanced out by its number of protons. In contrast, the material that loses the electrons will have a \_\_\_\_\_ charge. This is due to a shortage of electrons, which means there are more \_\_\_\_\_ than \_\_\_\_\_.

A charged object creates an electrical force field around it, which makes other objects be drawn to it (\_\_\_\_\_) or pushed away from it (\_\_\_\_\_). The general rules for this are as follows:

- Objects with \_\_\_\_\_ charges (i.e., two positively charged objects or two negatively charged objects) will \_\_\_\_\_ one another.
- Objects with \_\_\_\_\_ charges (i.e., one positively charged, and one negatively charge object) will be \_\_\_\_\_ one another.

### **Examples of Static Electricity**

1. When you rub a balloon on your head, your hair will stand up. This is due to the transfer of \_\_\_\_\_ between the balloon and your hair. The imbalance of charges this creates causes the hair to be \_\_\_\_\_ to the balloon and stand up. A similar situation occurs when you rub your hair on the trampoline mat.
2. Walking on carpet creates \_\_\_\_\_ between your shoes and the carpet. This causes a transfer of charge from the carpet to your shoes. The charge builds up in your body and is then released when you touch a \_\_\_\_\_ object such as a door handle which gives you an electrical shock.

