

# Electrical Charge Assignment – Student Edition

## I. Vocabulary match up

Definition	Term
1. Materials which allow electrons to flow through them.	a) Negatively charged
2. Negatively charged particles which orbit the nucleus of an atom.	b) Static electricity
3. Neutral particles found in the atom's nucleus.	c) Current electricity
4. Describes an object which has lost electrons.	d) Positively charged
5. Positively charged particles found in the nucleus of an atom.	e) Atoms
6. Materials which prevent electrons from flowing through them.	f) Protons
7. The flow of electricity in a conducting pathway or circuit.	g) Electrons
8. The build-up of electrical charge in an insulator.	h) Neutrons
9. Describes an object which has gained electrons	i) Conductor
10. Particles which have the same number of protons and electrons.	j) Insulator

## II. Atomic Structure Review

1. Draw and label the structure of a lithium atom in the space below (lithium has an atomic number of 3 and a mass number of 7)

2. Name the particle(s) found in the nucleus.

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3. How many protons, neutrons and electrons does lithium have?

Protons \_\_\_\_\_

Neutrons \_\_\_\_\_

Electrons \_\_\_\_\_

4. Describe how lithium can become charged.

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5. Give the term for an atom which has lost or gained electrons.
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### III. True or false?

Decide if the following statements are true or false. Correct the false statements to make them true.

1. Electricity is a form of energy.
2. Static electricity involves the flow of electrons.
3. Protons and electrons have opposite charges and can balance each other out.
4. Static electricity is caused by an imbalance of charge between two conducting materials.
5. Ions can give or receive electrons and become atoms.

### IV. Lightning

*Read the short article on how lightning forms and then use it to answer the questions.*

Lightning begins as static charges inside a cloud. The turbulence inside a cloud causes the water vapor and ice crystals to rapidly move around during a thunderstorm and the positive and negative charges in the cloud to separate into different regions within the cloud. The top of the cloud normally accumulates positive charges while the bottom accumulates negative charges.



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The build-up of these charges becomes significant over time causing electrons to jump from one part of the cloud to another creating a spark. This heats the air so much that it glows bluish-white, producing lightning. The intense heat also causes the rapid expansion of the air causing the loud noise we call thunder. Lightning not only sparks within a cloud, but between clouds and from the base of a cloud to the ground.

## Questions

1. Define static electricity.

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2. What are the requirements for lightning to occur?

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3. Lightning can also hit the ground. What charge would you expect the ground to have if the spark originates from the base of the cloud?

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4. Describe two other examples where static electricity might be observed.

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