

## Reading Comprehension Worksheet Magnetism & Electricity

Magnetism and electricity are closely related phenomena. Electric charge is a fundamental property of matter. Matter is made up of electrons, neutrons, and protons. Electrons have a negative electric charge, while protons have a positive electric charge; neutrons have no electric charge. These tiny particles are the building blocks of atoms. An atom has a net positive electric charge when it loses one of its electrons, and a net negative electric charge when it gains an extra electron. On the other hand, magnetic charges do not exist - Magnetic fields are generated solely by moving electric charges.

An example of the relationship between electricity and magnetism is the motor. In a motor, a voltage is applied across the terminals of a coil of wire. The voltage causes the electrons in the wire to move, which in turn generates a current. This current results in a magnetic field, which interacts with permanent magnets attached to the core of the motor, causing it to move.

Perhaps the most significant relationship between electricity and magnetism is light, which is known to physicists as an electromagnetic wave. Light waves are oscillating patterns of electric and magnetic fields, propagating through space at the speed of light ( $3 \times 10^8$  meters/second).

Electric and Magnetic phenomena are intricately described by a collection of physical laws, known as Maxwell's equations. Fully understanding these complex equations require a thorough knowledge of calculus and differential equations. For more information, take a course in electromagnetic theory from your local university.

1. What is an atom made up of?

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2. What is a magnetic field?

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3. In most cases, does electricity create magnets or do magnets create electricity? Explain.

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4. When some on say "The Speed of Light", what are they referring to?

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