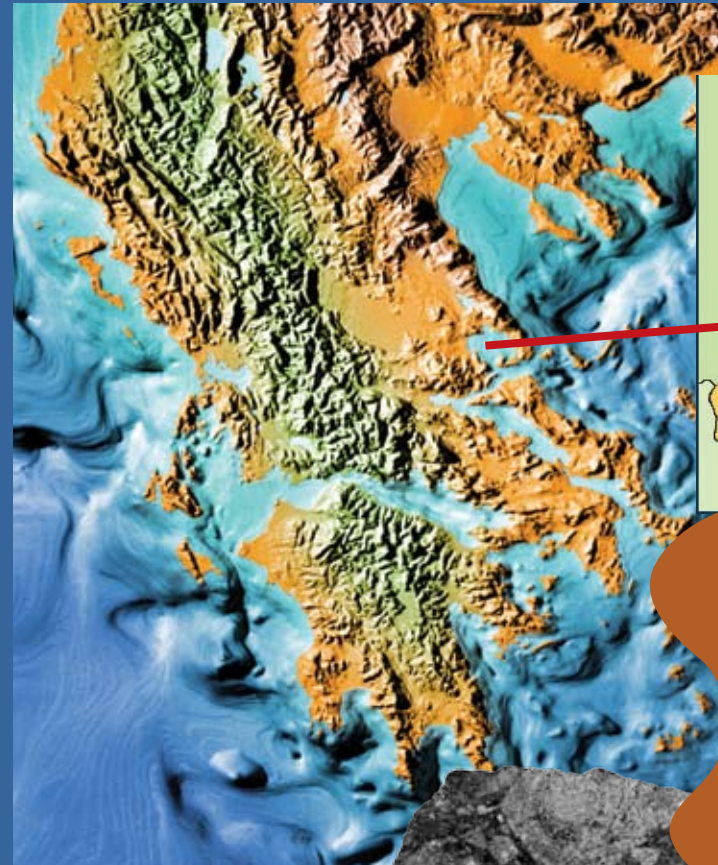




The Electromagnetic Force

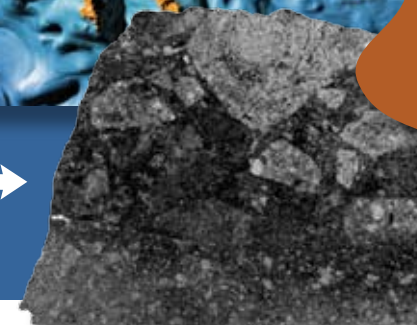
You may not know it, but you use **electromagnets** (uh-lek-troh-MAG-nuhts) many times every day. They are everywhere. They produce **electricity** (uh-lek-TRIS-i-tee) for homes. **Magnetism** is used to store data in computers. Electromagnets bring pictures to television screens. Nearly everything we do is affected by electromagnets. Without them, the world would be very different.

Electromagnetism is a powerful force. It is the combined power of electricity and magnetism.



Where Magnets Got Their Name

Lodestone was very common in Magnesia (mag-NEE-zuh). **Magnets** were named after this area of Greece.



A piece of magnetite, also known as lodestone. →

People have always been curious about electricity and magnetism. The ancient Chinese and Greeks observed magnetism in a mineral called **lodestone**. Lodestone attracts tiny bits of iron.

In 1752, Benjamin Franklin wrote a paper on what might happen in an experiment in which one flew a kite in a storm. There's no proof that he actually did it. Others did, and they electrocuted themselves more often than not!

← Benjamin Franklin and what he might have looked like while experimenting with electricity in a storm

Atoms at Work

So, how does electromagnetism work? The story begins with nature's building block. It is the **atom**.

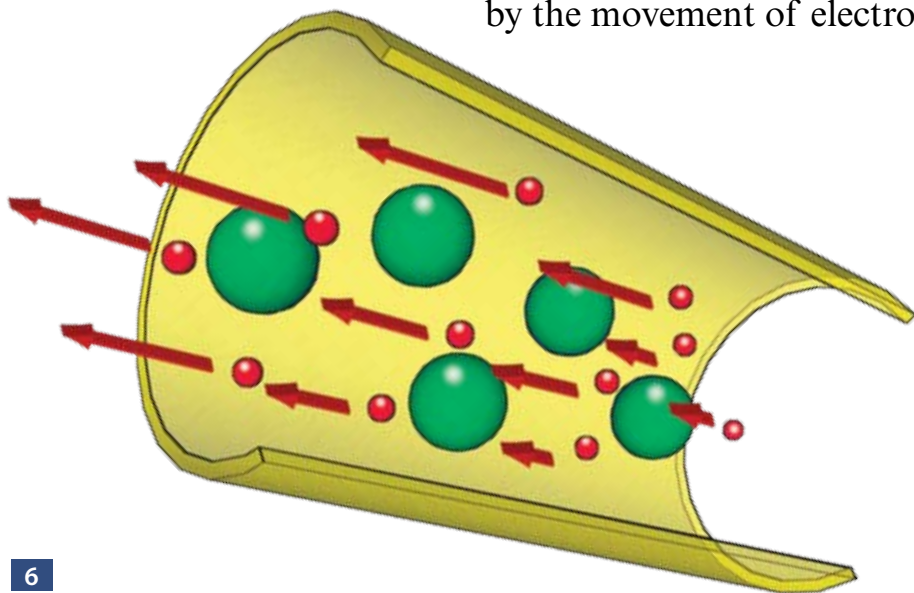
Everything in nature is made up of matter. Matter is made up of tiny particles called atoms.

At the center of the atom is a **nucleus** (NOO-klee-uhs). Inside the nucleus are tiny particles (PAR-tuh-kuhls) called **protons** and **neutrons**. Protons have positive electric charges. Neutrons have no charge.

Circling around the nucleus are clouds of really small particles called **electrons**. Electrons carry a negative charge.

Each atom has the same number of electrons and protons. It is the attraction of these opposite charges to each other that holds the atom together.

In some atoms, the electrons can break free of the atom and join another atom. As these electrons jump from atom to atom, an electrical charge is created. Electricity is the energy created by the movement of electrons.



As the electrons move through a conductor, such as your electrical wire, the electrical charge creates a current of electricity to provide power.

Electromagnetic Field of an Atom

Each electron in an atom spins around the nucleus. This creates a weak electromagnetic field. A **field** is a region where a force acts.

