



# Atoms

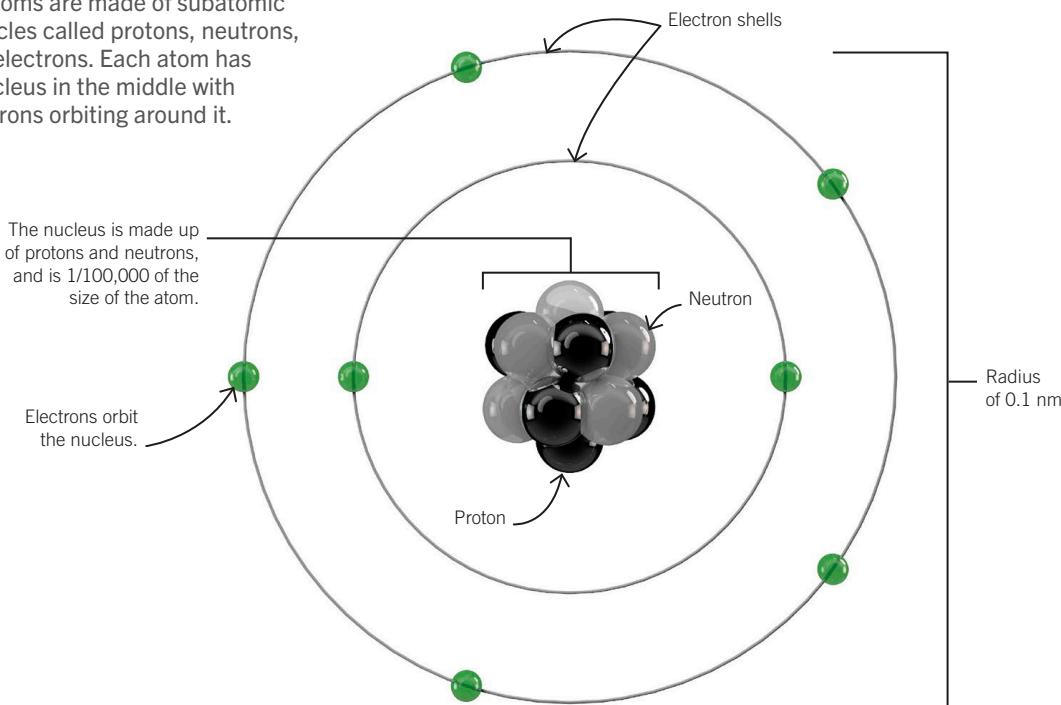
Everything in the Universe is made of atoms. They are the smallest unit of elements (see page 30), such as gold, carbon, or oxygen, and all matter is made of elements. All atoms are microscopically small. They vary in size, but a typical atom is one-ten-millionth of a millimeter. A piece of paper is about one million atoms thick.

## Key Facts

- ✓ All matter is composed of atoms.
- ✓ Atoms are very small and have a radius of 0.1 nanometers.
- ✓ Atoms are made up of even smaller subatomic particles called protons, neutrons, and electrons.

### Atomic structure

All atoms are made of subatomic particles called protons, neutrons, and electrons. Each atom has a nucleus in the middle with electrons orbiting around it.



### What's Inside an Atom?

Protons and neutrons have the same mass, and together they make up the atom's total mass. Electrons are much lighter, smaller, and have almost no mass. Protons have a positive electric charge, neutrons have no charge, and electrons have a negative electric charge.

	Charge	Mass
⊕ <b>Proton</b>	+1	1
○ <b>Neutron</b>	0	1
⊖ <b>Electron</b>	-1	0

The charges and the masses given here are all relative to one another, and are not exact measurements.