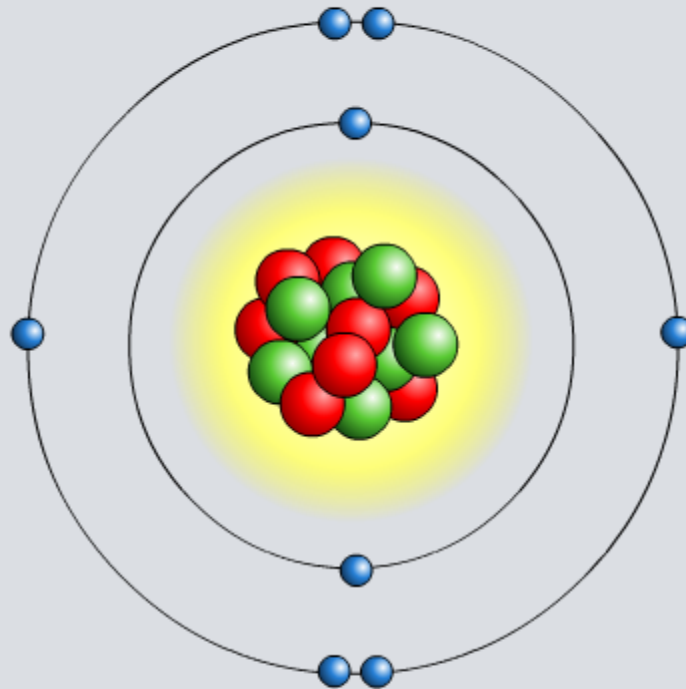


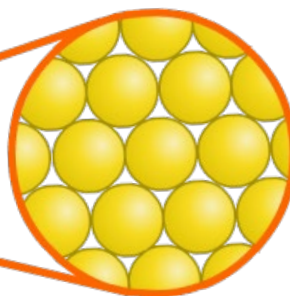
Atomic Structure



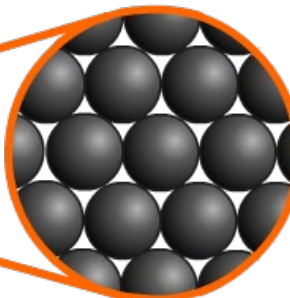
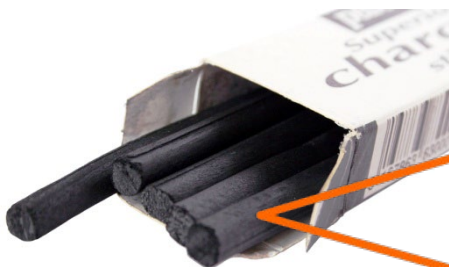
Elements – different types of atom

Elements are the simplest substances. There are about 100 different elements.

Each element is made up of very tiny particles called **atoms**, and each element is made up of just one particular type of atom, which is different than the atoms in any other element.



Gold is an element made up of only **gold atoms**.



Carbon is an element made up of only **carbon atoms**.

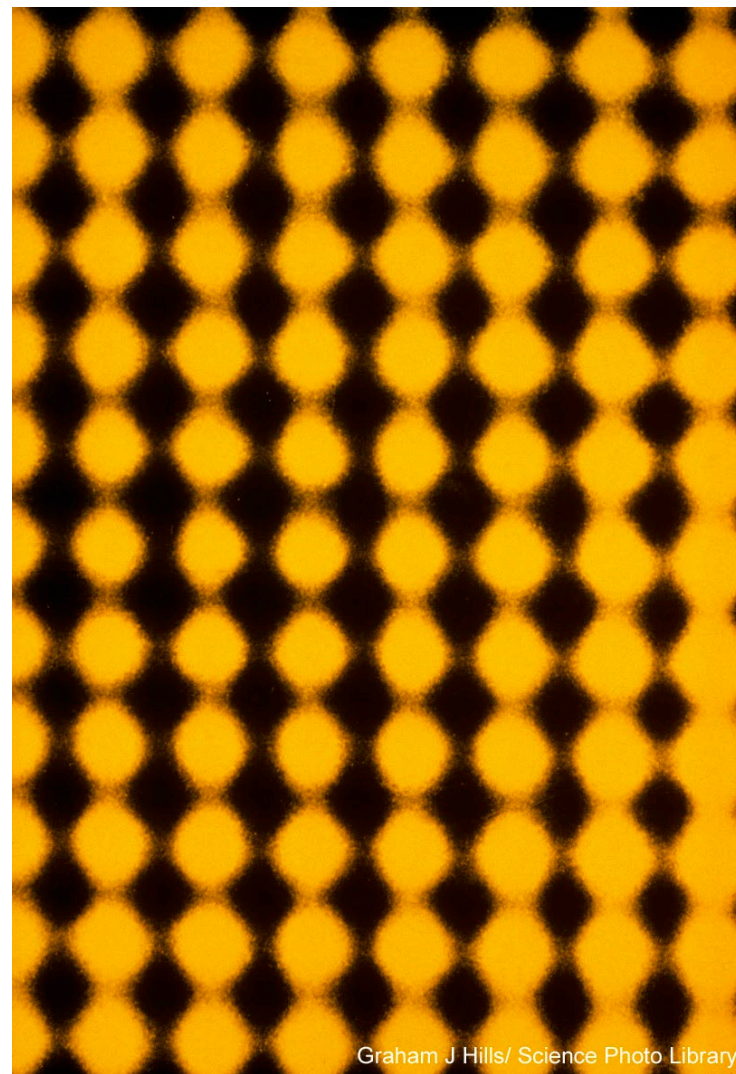


John Dalton had the first ideas about the existence of atoms over 200 years ago.

However, it is only relatively recently that special microscopes (called electron microscopes) have been invented that can actually 'see' atoms.

This image is highly magnified. What could it be showing?

The yellow blobs are individual gold atoms, as seen through an electron microscope.



Graham J Hills/ Science Photo Library

How small is an atom?

Atoms are very small – they are about 0.00000001 cm wide.

Think about the thickness of a potato chip.

The number of atoms you would need to stack up to make the thickness of a chip is approximately the same number of chips you would need to stack up to make the height of Mount Everest!

That's roughly 7 million chips!



The Amazing Atomic Zoom

diamond 1cm

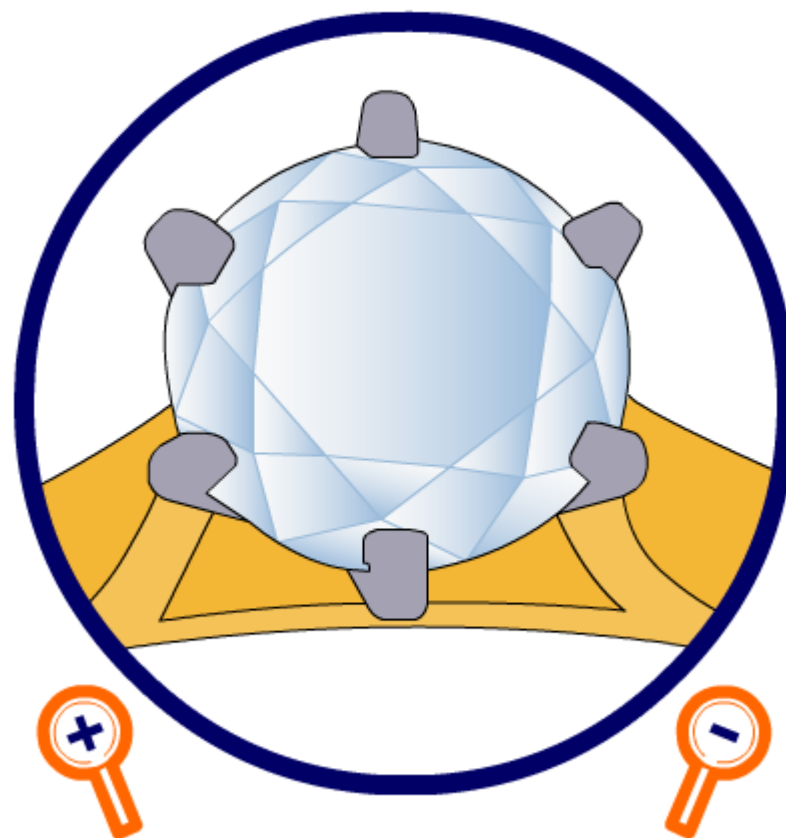
atoms

lattice

one atom

nucleus

Diamond is made of carbon – the same element as the graphite in pencils.



?

↶

What particles are atoms made of?

For some time, people thought that atoms were the smallest particles and could not be broken into anything smaller.

Scientists now know that atoms are actually made from even smaller particles. There are three types:



proton



neutron



electron

How are these particles arranged inside the atom?

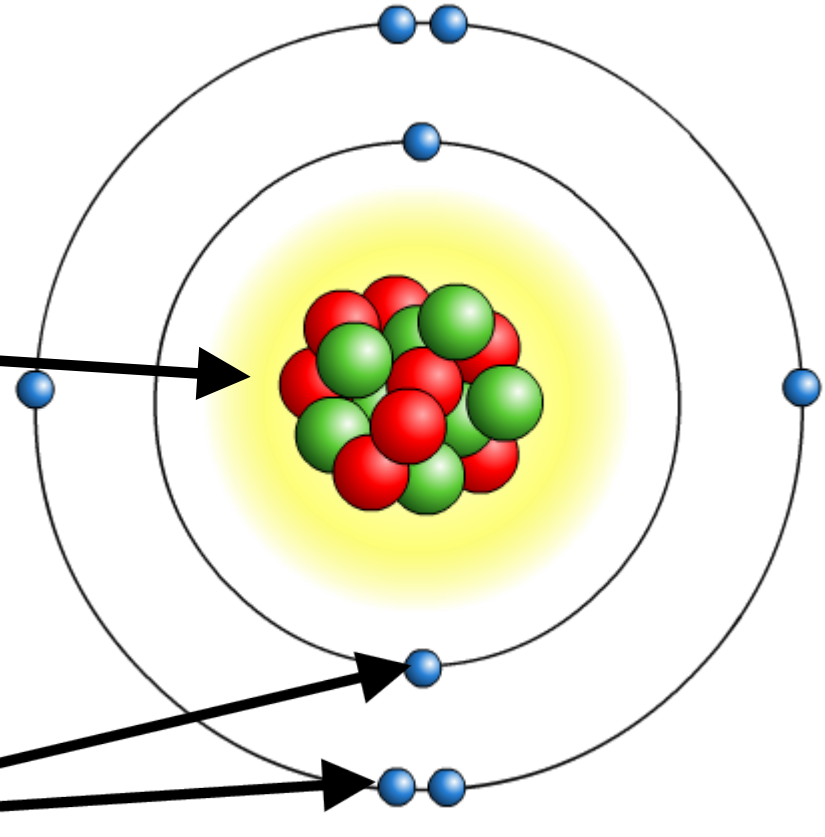


What is the structure of an atom?

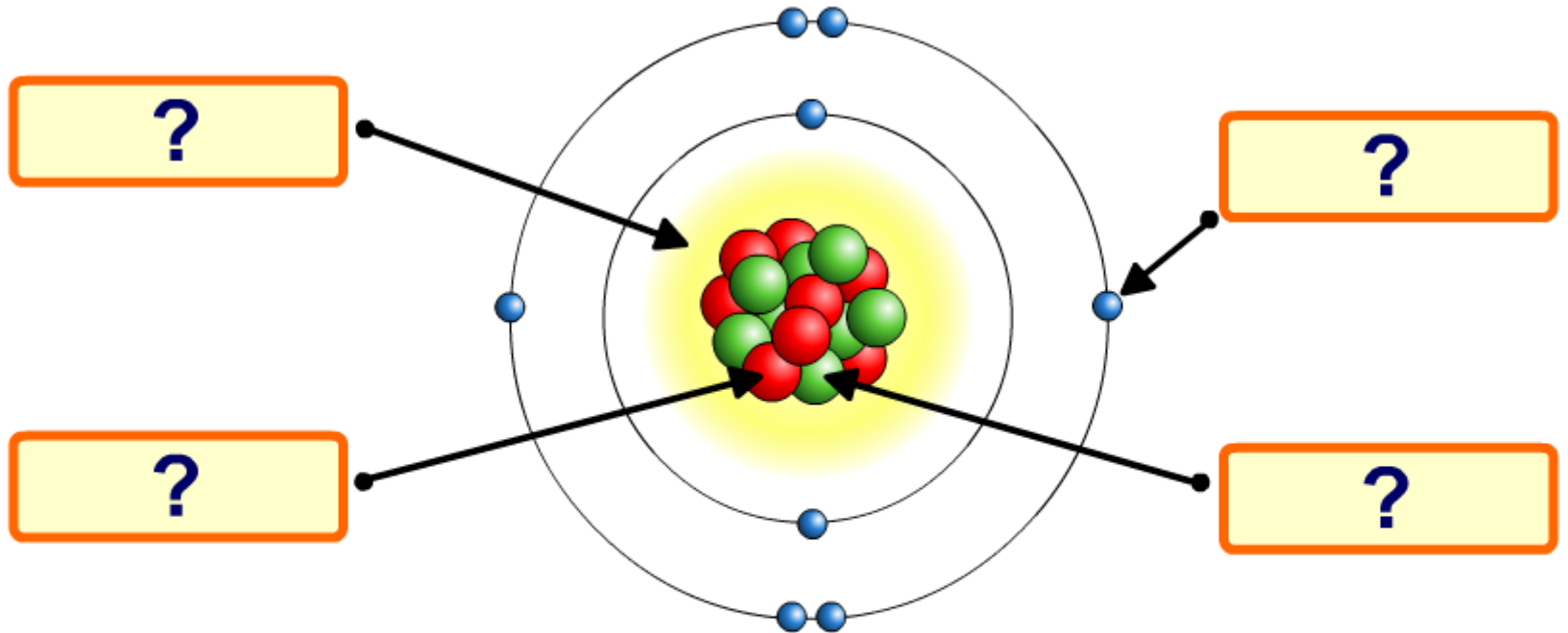
Protons, neutrons and electrons are **not** evenly distributed in an atom.

The protons and neutrons exist in a dense core at the center of the atom. This is called the **nucleus**.

The electrons are spread out around the edge of the atom. They orbit the nucleus in layers called **shells**.



What are the parts of the atom?



?

?

?

?

neutron

proton

electron

nucleus

?

C

solve

↶



Discovery of atomic structure

Everything on Earth is made up of atoms, and chemistry is all about the atoms and how they interact.

Click a date in the timeline below to find out who made important discoveries about the structure of the atom.



450BC

1803

1897

1907

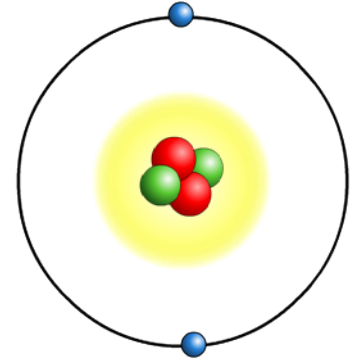
1913

1932



There are two properties of protons, neutrons and electrons that are especially important:

- mass
- electrical charge.



Particle	Mass	Charge
proton	1	+1
neutron	1	0
electron	almost 0	-1

The atoms of an element contain equal numbers of protons and electrons and so have no overall charge.





Which do these statements relate to?

protons

neutrons

electrons

located in shells
orbiting nucleus



solve

