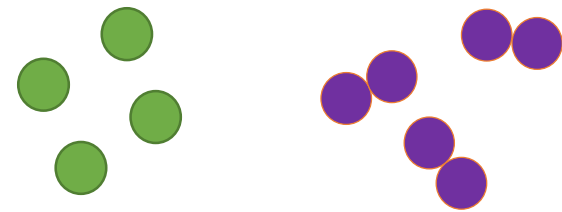


| Keyword        | Definition                                                                                                                                                   |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Atom           | The smallest particle of an element.                                                                                                                         |
| Atomic number  | The number of protons in an atom.                                                                                                                            |
| Brittle        | A material which can break easily and not bend.                                                                                                              |
| Compound       | Two or more elements chemically bonded together.                                                                                                             |
| Conductor      | A material in which heat and electricity can pass through easily.                                                                                            |
| Ductile        | A material which can be drawn (pulled) into wires.                                                                                                           |
| Element        | A pure substance made up from only one type of atom.                                                                                                         |
| Formula        | Element symbols and subscript numbers which show how many atoms of each element are bonded together e.g., O <sub>2</sub> , H <sub>2</sub> O, CO <sub>2</sub> |
| Groups         | The vertical columns on the Periodic table.                                                                                                                  |
| Malleable      | A material which can be hammered or pressed into a different shape without breaking.                                                                         |
| Molecule       | Two or more atoms chemically bonded together.                                                                                                                |
| Periodic table | A structured table which lists all the elements.                                                                                                             |
| Periods        | The horizontal rows on the Periodic table.                                                                                                                   |
| Sonorous       | A material which will make a ringing sound when hit.                                                                                                         |

## Atoms and elements

Everything is made up of atoms but they are far too small to see, even with a microscope. Elements are made from only one type of atom and cannot be broken into anything simpler e.g., pure gold is only made from gold atoms.

Element can be represented as symbols. These symbols can either have one or two letters and each element symbol always starts with a capital letter.



Atoms of an element  
Example: Silver (Ag)

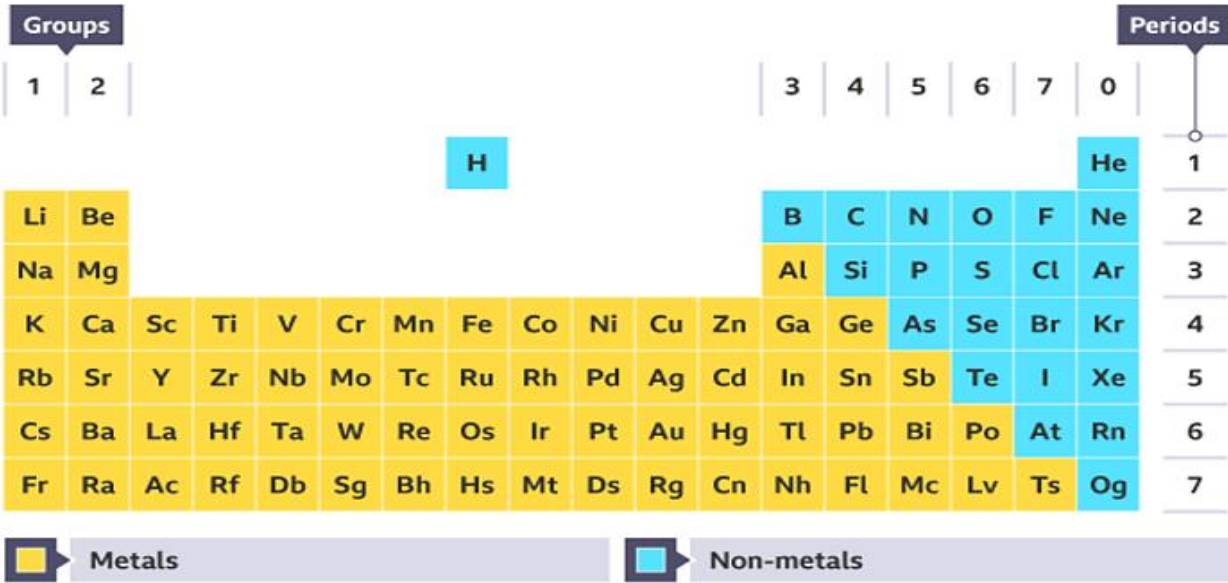
Molecules of an element  
Example: Nitrogen (N<sub>2</sub>)

Molecules can either be elements or compounds.

## The Periodic Table



Dmitri Mendeleev produced one of the first practical periodic tables in the 19<sup>th</sup> century. The modern periodic table is based closely on his ideas.



Hydrogen is a unique element. It can be listed in group 1 as it has similar properties to group 1 metals, but it isn't a metal. This is why it is commonly found in the middle of the periodic table on its own.

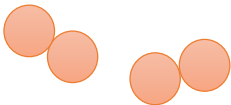
The periodic table shows the name and / or chemical symbol for all the elements on Earth. Compounds such as water and carbon dioxide are not listed within the periodic table. There are 8 groups and 7 periods (plus the transition metals in the middle)

The elements are arranged in increasing atomic number starting with hydrogen, helium, lithium and then continue reading left to right along the periods. Elements in the same group have similar chemical properties. All metals are on the left and non-metals are on the right of the periodic table. They are separated by a zig-zag line as shown above.

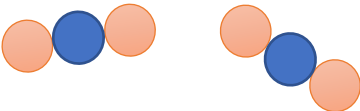
(Most periodic tables also list the atomic number and mass number for elements, which will be explained during your GCSE's.)

## Compounds and molecules

Molecules are formed when two or more atoms chemically bond together. Different elements can combine together to make compounds.

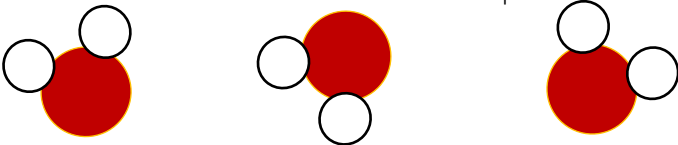


Molecules of an element  
Example: Oxygen (O<sub>2</sub>)



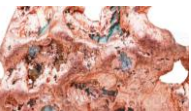
Molecules of a compound  
Example: Carbon dioxide (CO<sub>2</sub>)

Compounds can be represented as formulae as well which tell us the number of atoms of each element within the compound.



Example: Water has the formula H<sub>2</sub>O which means there are two hydrogen atoms and one oxygen atom.

Compounds have different properties from the elements they are made from but are named from the elements they contain.



Example: copper



chlorine



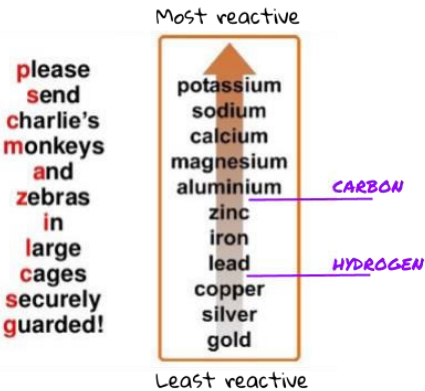
copper chloride

## Metals and non-metals

The majority of elements on Earth are metals. Most metals (especially the transition metals) share similar properties which include high melting and boiling points, good conductors, shiny, malleable, ductile and sonorous.

Similar properties of non-metals include lower melting and boiling points, poor conductors, dull, brittle. Some non-metals do not have these common properties. An example of this is carbon which has two main forms - graphite and diamond. Both of these have high melting points and are shiny. Graphite also conducts electricity.

The order of reactivity of some metals is listed in the reactivity series. More reactive metals will displace less reactive metals during chemical reactions.



## Useful YouTube links:



[The periodic table](#)



[Atoms, elements and compounds](#)



[Metals](#)

## Skills:

**Practical:** Identifying variables  
**Application:** Using hazards symbols, identifying hazards and risks.  
**Maths:** Calculating averages, drawing scales and plotting points.  
**Analysis:** Analyse information and ideas to develop experimental procedures.  
**Extended response:** Identifying trends in data and writing conclusions.