

## Elements, Compounds, Mixtures

An element is a substance that cannot be broken into simpler substances by chemical means.

If you take Gold and break it down to the smallest piece possible you still only get Gold!



There are around 100 known elements.  
These make up everything, including us.  
All the Elements are made in the middle of stars.



## What elements should you know?

These 11 elements need to be known off by heart.

METAL	SYMBOL
COPPER	Cu
ZINC	Zn
ALUMINIUM	Al
IRON	Fe
SILVER	Ag
GOLD	Au

NON-METAL	SYMBOL
CARBON	C
OXYGEN	O
SULFUR	S
HYDROGEN	H
NITROGEN	N

# Compounds

A **compound** is a substance that is made up of two or more different elements combined together chemically.

**HYDROGEN** gas can be combined with **OXYGEN** to make **WATER** ( $H_2O$ )

$H_2$



O



## More Compounds...

**Water** is a compound because it is two elements chemically combined.

**Table Salt**, Sodium Chloride (NaCl) is also a compound.



**Sand** is Silicon and Oxygen.



**Sugar** has Carbon, Hydrogen and Oxygen.

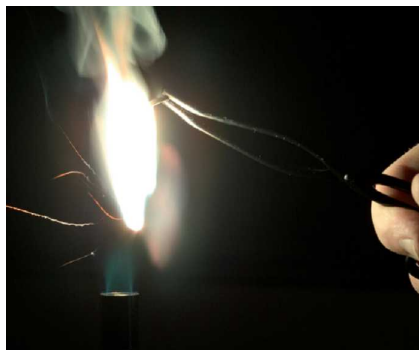


## Making Compounds

Compounds - are made when there's a **chemical reaction**.

When we burn Magnesium in the air we get Magnesium and Oxygen sticking together.

This compound is called **Magnesium Oxide** or  $MgO$ .



It is used in Fireworks and has a very bright flame.

What compound do you think we would get if we burn Carbon in Oxygen?

What compound do you think we would get if we combine an explosive metal (Sodium) and a poisonous gas (Chlorine)?



## Mixtures

A Mixture consists of two or more chemicals mingled together but not chemically combined.

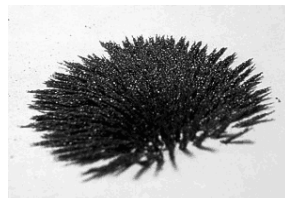


Can you think of other Mixtures?



## Experiment on Mixtures

If we had a mixture of iron and powdery sulfur, how could we separate them?



We could use a Magnet. It would remove the iron from the mixture

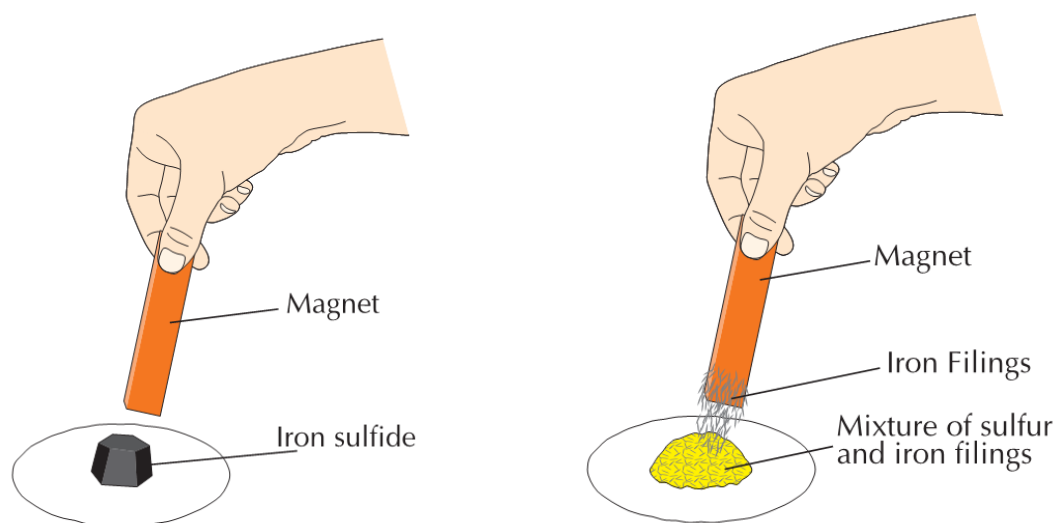


## Mixture or Compound?

If we heat the mixture of Iron and Sulfur it becomes a **Compound**.

The compound **Iron Sulfide** (FeS) cannot be separated by a magnet.

The mixture of Iron and Sulfur can be separated by a magnet.





## Differences between Mixtures and Compounds

MIXTURE	COMPOUND
The amount of substances in a mixture can vary	Elements in a compound are always found in the same amount.
A mixture has 2 or more substances.	A compound is a single substance.
Easy to separate	Hard to separate
No energy changes	Heat is given in or taken out.