

Elements and Compounds

Aim:

- State that atoms join together with CHEMICAL BONDS
- State that atoms can join into small groups called MOLECULES
- State that atoms can join into GIANT structures called LATTICES / NETWORKS
- State that elements contain only 1 type of atom
- State that elements cannot be broken down into anything simpler
- State that compounds are substances that contain two(or more) different types of atom, chemically bonded together
- State that mixtures are different substances in the same container, NOT chemically bonded together
- Recognise elements / compounds / mixtures from diagrams
- Recognise molecules and lattices from diagrams

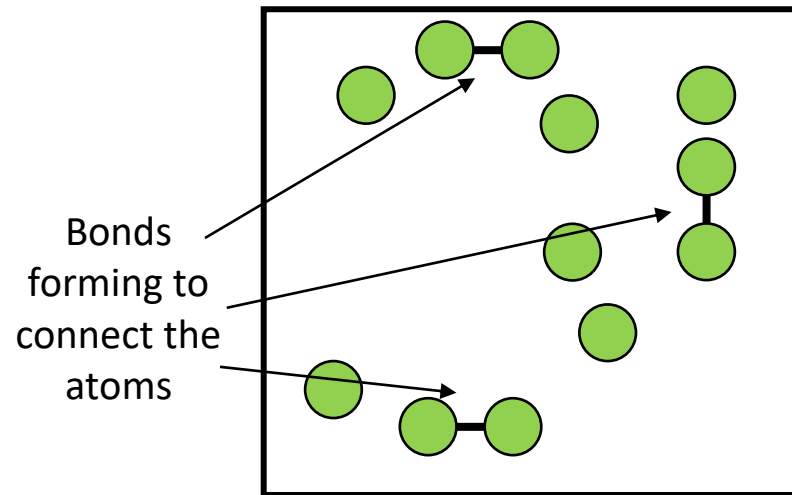
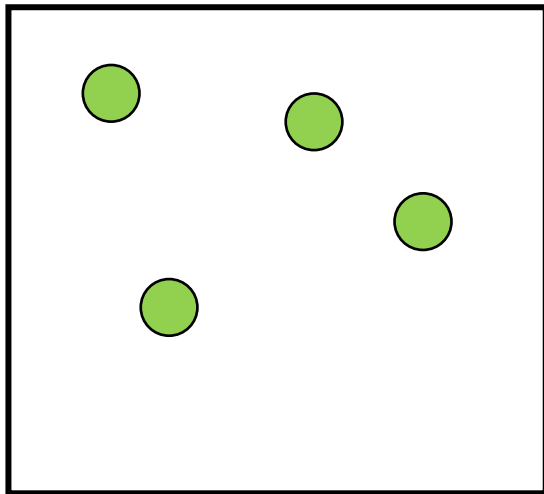
Atoms and How they Can Join

All matter is made up of atoms.

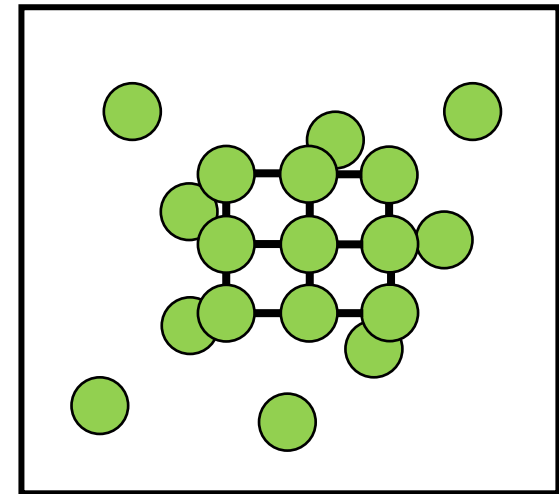
These atoms are often drawn as small circles.

During chemical reactions, these atoms can form CHEMICAL BONDS.

Chemical bonds can join atoms into two main structures:



1. Small groups called molecules

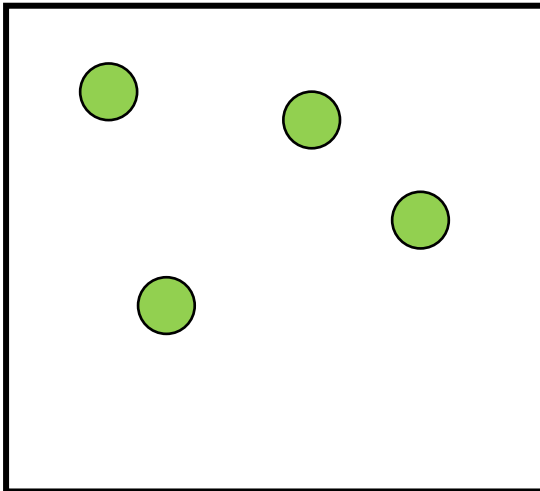


2. One giant structure called a lattice or network

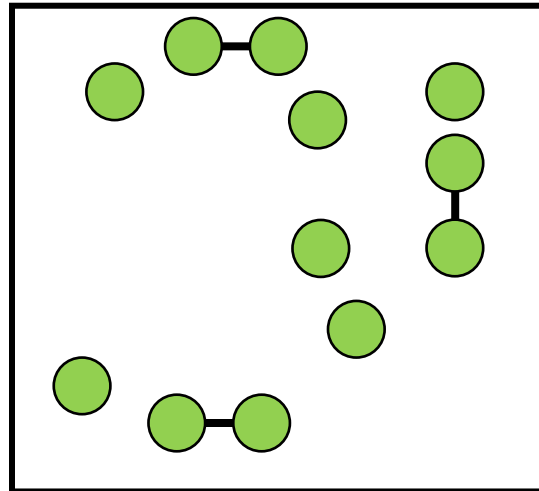
Elements

Elements are substances where ALL of the atoms are the same TYPE. Elements can't be broken into anything simpler because you can't get any simpler than one atom type!

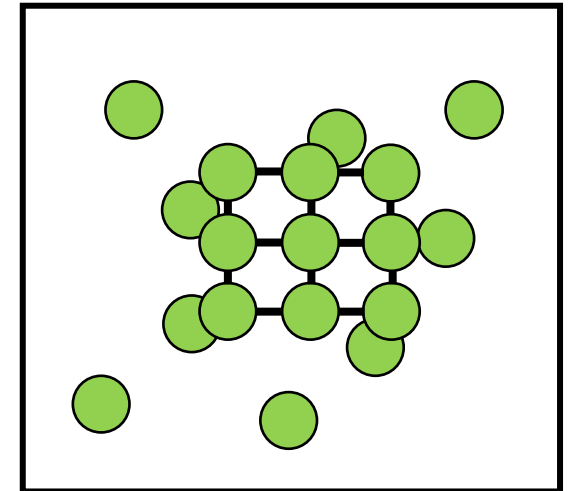
It makes no difference if they are molecules, lattice/networked or even monatomic (single atoms on their own). IF they are the same type, then they are elements!



Element – all atoms are the same type (monatomic)



Element – all atoms are the same type (molecules)

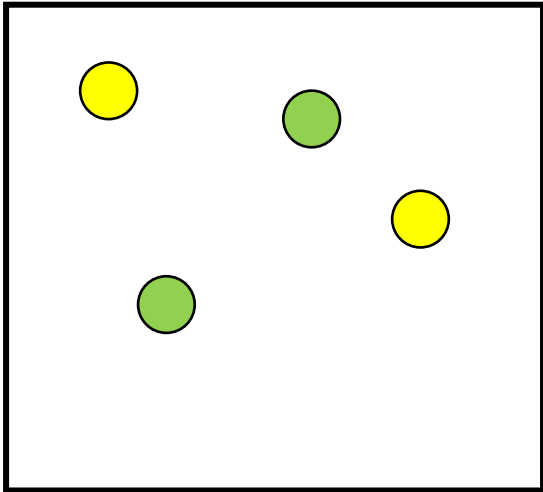


Element – all atoms are the same type (lattice / network)

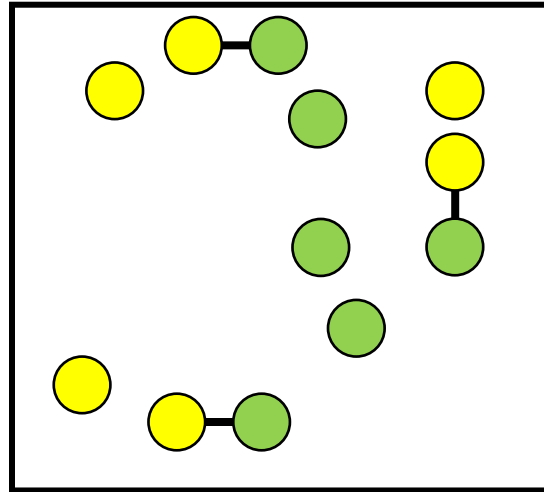
Compounds

Compounds – Two (or more) different types of atom, CHEMICALLY BONDED together.

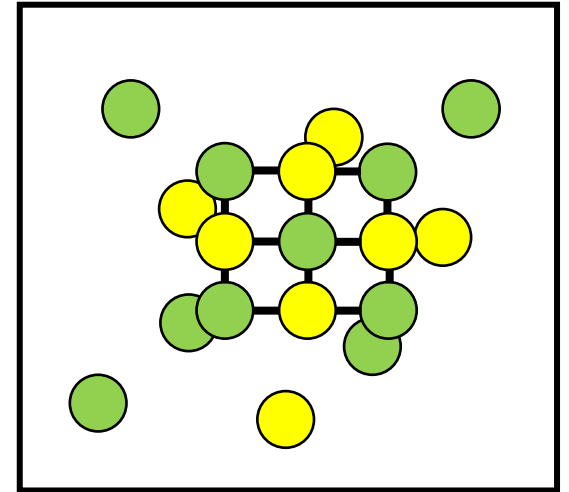
It is impossible to get monatomic structure for compounds as they have to be BONDED to be classed as a compound. You can also split compounds into the different types of atom that make them up.



Not a compound – the different types of atom are not bonded together



Compound – different types of atom bonded together (molecules)

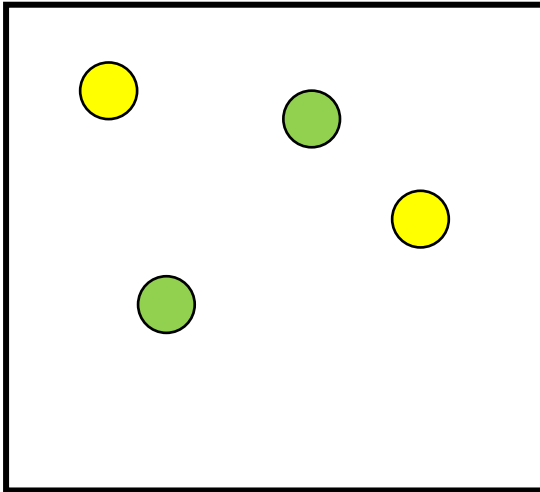


Compound – different types of atom bonded together (network / lattice)

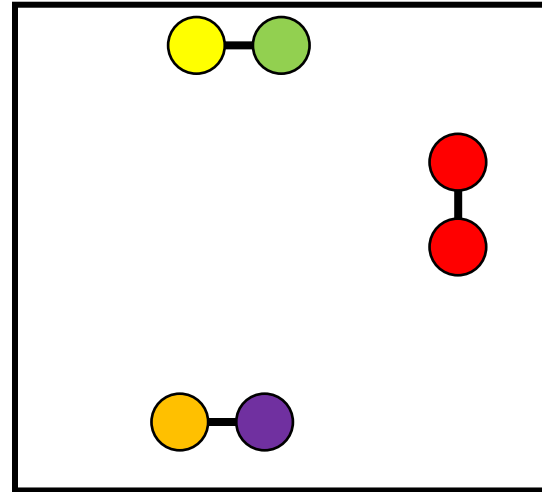
Mixtures

A mixture contains different substances NOT chemically bonded together.

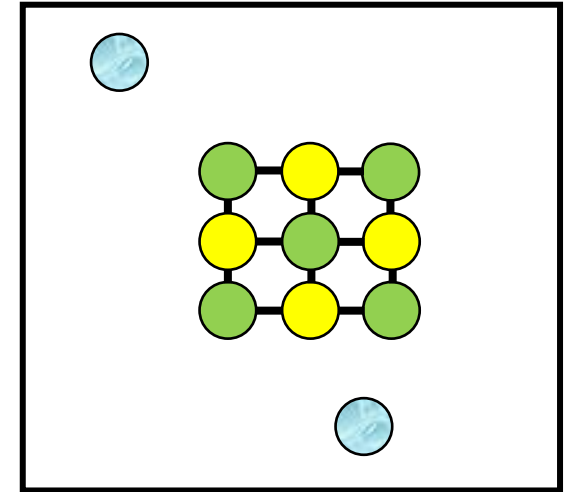
Mixtures of elements and compounds are common. They are easy to spot in diagrams because the different looking molecules / lattices / atoms will NOT be joined by bonds.



Mixture of 2 elements

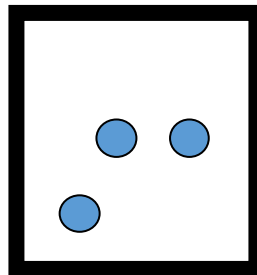
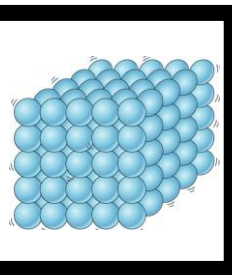
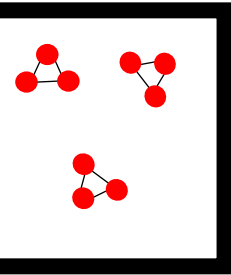
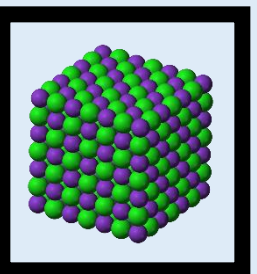
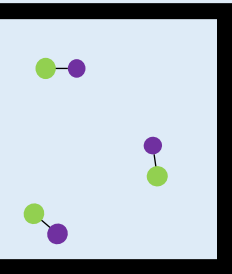
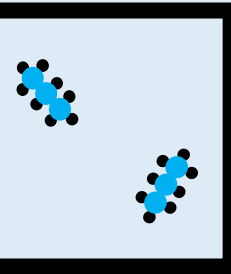
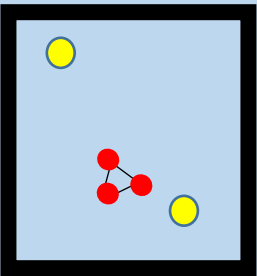
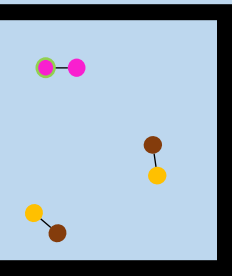
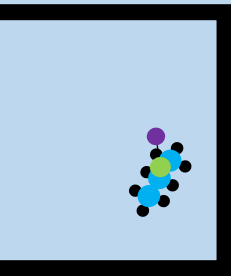


Mixture of 2
compounds and 1
element

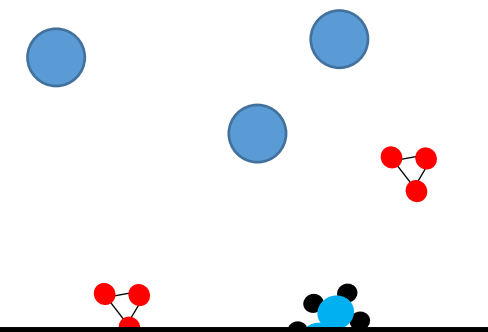
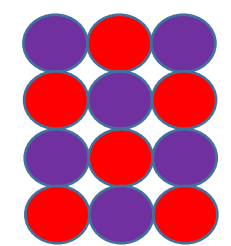
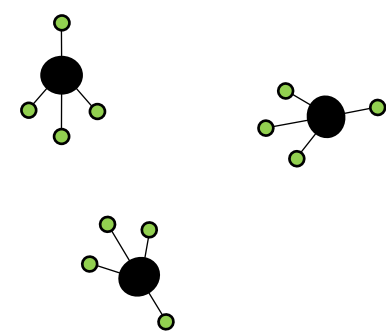
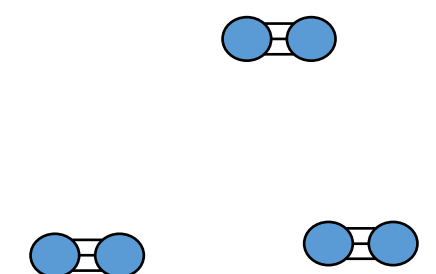
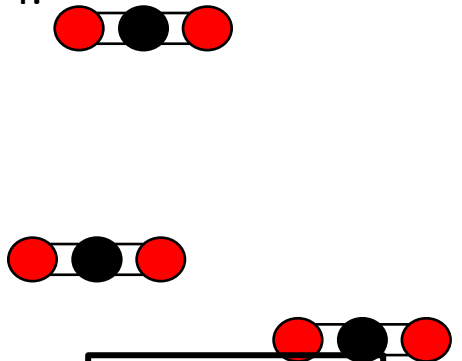
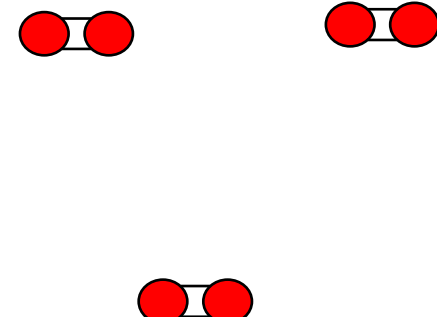
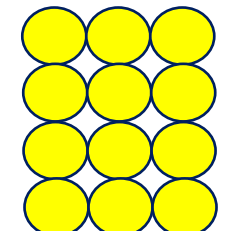
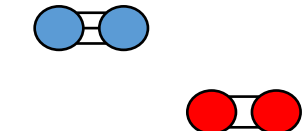


Mixture of 1 element
and 1 compound

Elements, Compounds and Mixtures - Summary

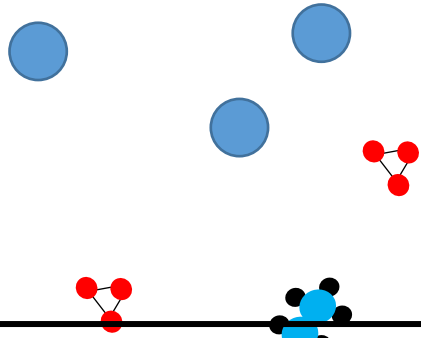
Type of substance	Definition	Diagram representing the particles			Examples
<h2>Element</h2>	<p>A substance made up of only one TYPE of atom</p>				<p>Gold, Oxygen... ANYTHING in the periodic table</p>
<h2>Compound</h2>	<p>Two or more different TYPES of atom chemically bonded to each other (bonded means joined)</p>				<p>Copper chloride Iron oxide Water (hydrogen oxide) <small>(names that sound like more than one element is present but may have common names like water)</small></p>
<h2>Mixture</h2>	<p>substances in the same container/space but NOT chemically joined together</p>	 <p style="text-align: center;">2 Elements</p>	 <p style="text-align: center;">1 Element 1 compound</p>	 <p style="text-align: center;">2 compounds</p>	<p>Salt water, air, etc</p>

Quick Check on definition understanding – Write down what is in the box. How many elements/compounds etc. The first box shows you the format of the answer.

<p>Example:</p>  <p>MIXTURE – 2 elements + 1 compound</p>	<p>1.</p>  <p>COMPOUND (lattice / network)</p>	<p>2.</p>  <p>COMPOUND (molecules)</p>	<p>3.</p>  <p>ELEMENT (molecules)</p>
<p>4.</p>  <p>COMPOUND (molecules)</p>	<p>5.</p>  <p>ELEMENT (molecules)</p>	<p>6.</p>  <p>MIXTURE – 1 Element (lattice/network) + 1 compound (molecule)</p>	<p>7.</p>  <p>MIXTURE – 3 Elements (2 molecules, 1 monatomic) + 1 compound (molecule)</p>

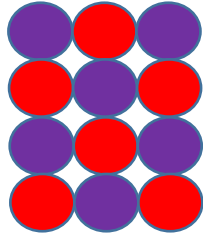
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Example:

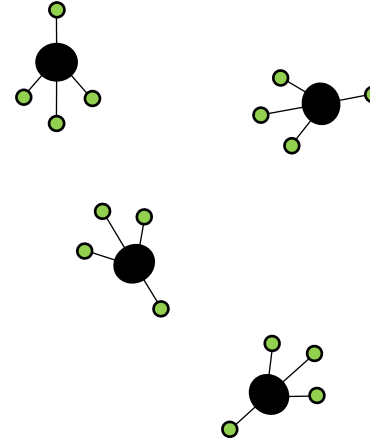


MIXTURE – 2 elements
+ 1 compound

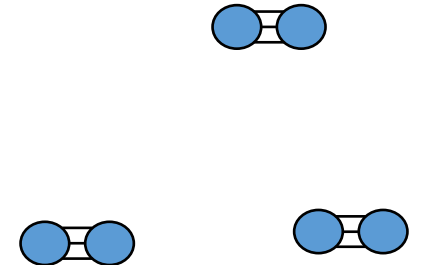
1.



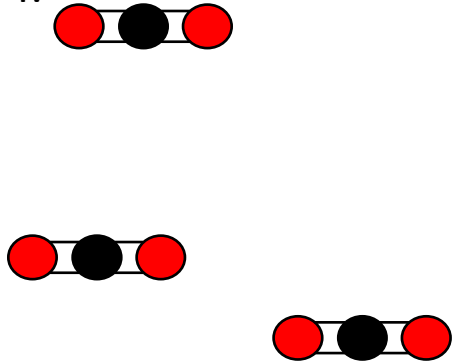
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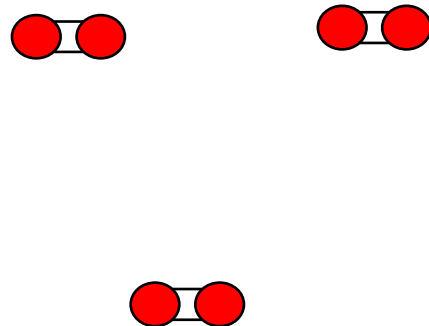
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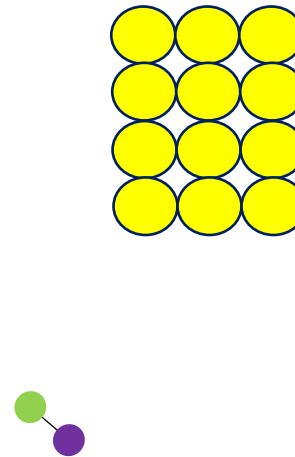
4.



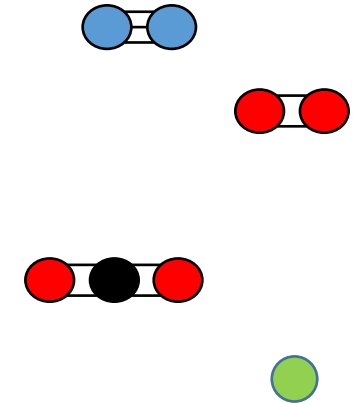
5.



6.



7.



Questions

1. What does a chemical bond do?

2. What name is given to a SMALL group of atoms bonded together?

3. What name is given to a GIANT structure where all atoms are bonded together?

4. What name is given to atoms that exist on their own – ie not bonded to anything?

5. What is meant by an element?

6. What is meant by a compound?

7. What is meant by a mixture?

8. Draw a diagram to represent:

(a) Molecules of an element

(b) Lattice of compound

(c) Mixture of 2 elements and 1 compound

Questions

1. What does a chemical bond do?

Joins atoms together

2. What name is given to a SMALL group of atoms bonded together?

Molecules

3. What name is given to a GIANT structure where all atoms are bonded together?

Lattice / network

4. What name is given to atoms that exist on their own – ie not bonded to anything?

Monatomic

5. What is meant by an element?

Substance where all atoms are the same type

6. What is meant by a compound?

Substance with two or more different types of atom chemically bonded together

7. What is meant by a mixture?

Different substances in the same container but not bonded together

8. Draw a diagram to represent:

(a) Molecules of an element

(b) Lattice of compound

(c) Mixture of 2 elements and 1 compound

