Your notes

KS3 Science: revision notes

C1.2 Atoms, elements and compounds

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Atoms and elements

- Everything is made of **atoms**. An **element** is a substance made of only one type of **atom**. There are about 118 elements.
- Each **element** has a symbol: O (oxygen), H (hydrogen), C (carbon), N (nitrogen), Na (sodium), Fe (iron), Cu (copper), Au (gold), Mg (magnesium), Cl (chlorine), S (sulfur), K (potassium).
- A symbol has one or two letters: the first is a capital and the second is lower case (Co is cobalt, but CO is carbon monoxide).

The periodic table

- The **elements** are arranged in the **periodic table**. Rows are called **periods** and columns are called groups.
- **Elements** in the same **group** have similar properties.
- Metals are on the left and in the middle; non-metals are on the right.

Metals and non-metals

- Metals are shiny, good conductors of heat and electricity, **malleable** (can be hammered into shape), ductile (can be pulled into wires) and sonorous (ring when hit). Most are solids with high melting points; mercury is a liquid.
- Iron, nickel and cobalt are magnetic.
- Non-metals are usually dull and are poor conductors (insulators); graphite (carbon) is an exception. Solid non-metals are brittle. Many are gases at room temperature; bromine is a liquid.
- Some metals react more vigorously than others. From most to least reactive: potassium, sodium, calcium, magnesium, zinc, iron, copper, gold.

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Compounds, molecules and formulae

- A **compound** is two or more **elements** chemically joined. Its properties are different from the **elements** it is made from: sodium (a reactive metal) and chlorine (a toxic gas) make sodium chloride (table salt).
- Heating iron and sulfur makes iron sulfide. The mixture could be separated with a magnet, but the **compound** can't, because it is a new substance.
- Naming: the metal comes first, and the non-metal ends in -ide (oxygen → oxide, chlorine → chloride, sulfur → sulfide). The ending -ate means oxygen is also present (copper sulfate contains copper, sulfur and oxygen).
- A **molecule** is two or more **atoms** joined together. A formula shows the **atoms**: H_2O has 2 hydrogen atoms and 1 oxygen atom; CO_2 has 1 carbon atom and 2 oxygen atoms.

Maths in science: mean and range

- Mean = the total of the values ÷ the number of values. For 12, 14 and 16: 42 ÷ 3 = 14.
- Range = the highest value – the lowest value. For 12, 14 and 16 the range is 4.

Key terms

Atom	The smallest part of an element that can exist.
Element	A substance made of only one type of atom.
Compound	Two or more elements chemically joined together.
Molecule	Two or more atoms joined together.
Chemical symbol	One or two letters that stand for an element, such as Na for sodium.
Chemical formula	Symbols and numbers that show the atoms in a substance, such as H_2O.
Periodic table	A chart of all the elements, arranged in groups and periods.
Group	A column of the periodic table.
Period	A row of the periodic table.
Malleable	Can be hammered into shape without breaking.
Reactivity	How easily a substance takes part in chemical reactions.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. What is an element?
2. What is the chemical symbol for sodium?
3. What is a compound?

Your notes

4. Which property do most metals have?
5. Where are the metals in the periodic table?
6. What is a column in the periodic table called?
7. What is the name of the compound made when magnesium reacts with oxygen?
8. Which elements are in copper sulfate?

Answers

1. A substance made of only one type of atom
2. Na
3. Two or more elements chemically joined
4. They conduct electricity
5. On the left and in the middle
6. A group
7. Magnesium oxide
8. Copper, sulfur and oxygen

What to do next

Practise 14 questions on this topic

Try 4 exam questions, with mark schemes

Read the lesson, one step at a time

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