

Atoms and Elements

An _____ is any substance made of _____.

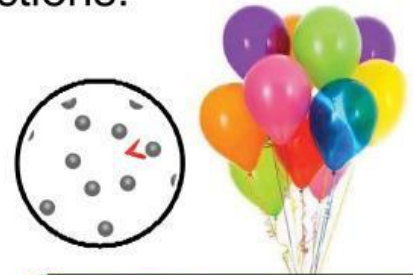
- Atoms are the smallest building blocks of matter and can not be broken down using chemical reactions.
- For example:



Carbon is an element made of only carbon atoms.



Copper is an element made of only copper atoms.

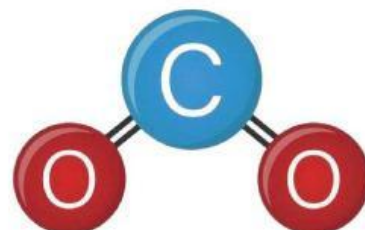


Helium is an element made of only helium atoms.

Compounds

A compound is a substance formed when two or more elements are joined together chemically.

- The elements in compounds are always present in fixed ratios.
- Compounds can be broken down into the elements that make them, but only using chemical reactions.



CO₂ is always
1 carbon:2 oxygen

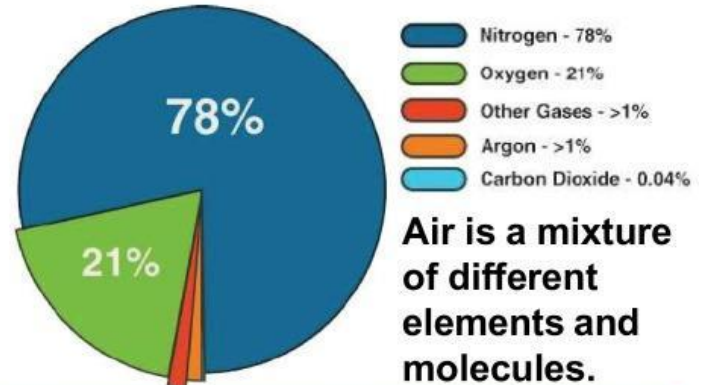
Examples: H₂O (water), CH₄ (methane),
NaCl (salt), C₆H₁₂O₆ (glucose/sugar).


EMG Education

Mixtures

A _____ is made when _____ are combined, but _____.

- In a mixture, the substances can be easily separated.
- Each substance in a mixture keeps its original properties.
- The proportion of the substances can vary (change).



Examples of mixtures are salt water, salad, salt and pepper, or air and water.

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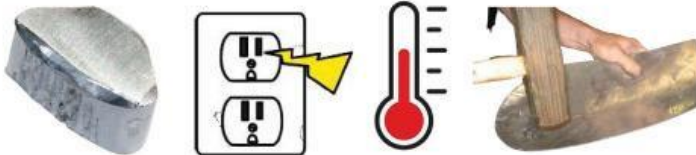
are on the left. Most of the elements are metals.

are
between the metals
and non-metals.

Metals and Non-Metals

Physical properties of metals

Physical properties of non-metals



Metals and Non-Metals

Physical properties of
metals

Physical properties of
non-metals

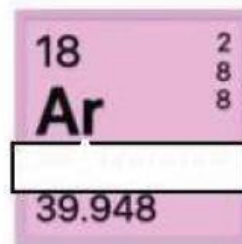
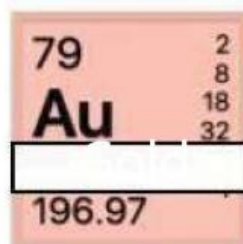
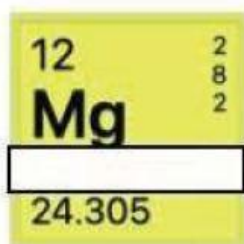
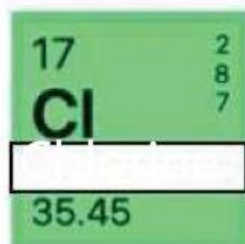
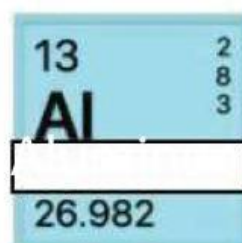
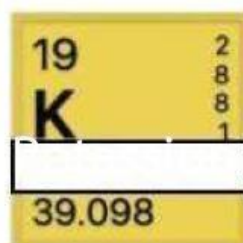
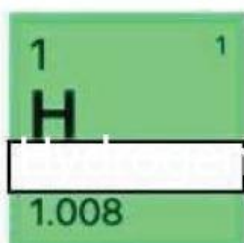
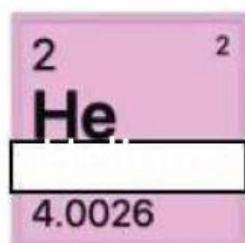


7) What is an element?

8) What is a compound?

9) What is a mixture?

10) Identify the name of the elements below:



11) Helium, Hydrogen, Argon, Chlorine are examples of what?

12) Aluminum, Potassium, Magnesium, Gold are examples of what?

13) List the physical properties of metal.

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Week 4: Atoms and Elements 2

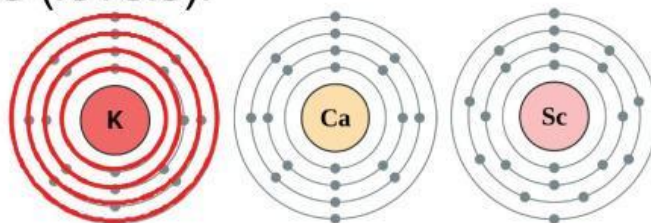


LIVEWORKSHEETS

Periods

The horizontal rows are called **periods**.

- There are in the periodic table.
- All the elements in a period share the of electron shells (energy levels).
- For example, all of the elements in period 4 have 4 electron shells (levels).



1	H	2	
3	Li	4	Be
11	Na	12	Mg
19	K	20	Ca
37	Rb	38	Sr
55	Cs	56	Ba
87	Fr	88	Ra

Groups

The vertical columns are called "groups" (sometimes called families).

- There are **7** in the periodic table.
- All elements in a group have **the same number** of valence electrons (outer electrons).
- For example, all of the elements in group 2 have 2 valence electrons (outer electrons).
- This means the elements in each group share similar chemical and physical properties.

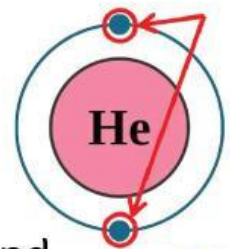
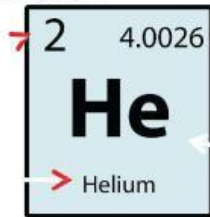
The diagram shows the atomic structures of Beryllium (Be) and Magnesium (Mg). Beryllium has two electron shells with two electrons in the outer shell. Magnesium has three electron shells with two electrons in the outer shell. To the right, a portion of the periodic table is shown, with elements in Group 2 (Be, Mg, Ca, Sr, Ba, Ra) highlighted in orange.

1	H	2	
3	Li	4 Be	
11	Na	12 Mg	13 Al
19	K	20 Ca	21 Sc
37	Rb	38 Sr	39 Y
55	Cs	56 Ba	57 La
87	Fr	88 Ra	89 Ac

Atomic Structure

Atoms consist of three basic particles: protons, electrons, and neutrons.

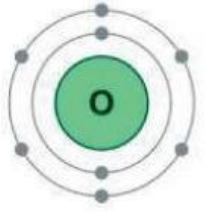
- The **atomic number** tells us how many **protons** are in the nucleus of the atoms. The number of **electrons** is equal to the number of protons.



- The **mass number** is how many protons and neutrons are in the nucleus.

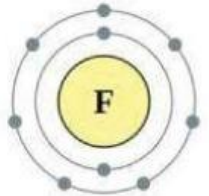
14) How many valence electrons and electron shells does Oxygen have?

What group and period does it belong to?



15) How many valence electrons and electron shells does Fluorine have?

What group and period does it belong to?



16) How many protons are in argon?

