

Home learning activities

Subject
Science
Year Group
Year 7
Unit of work / Knowledge organiser
Atoms and the Periodic Table - Revision
Activities
<ul style="list-style-type: none"> • Complete the 'Knowledge Check' by clicking on the link below (Mr Tobi has also emailed this link out to you): <p>https://forms.office.com/Pages/ResponsePage.aspx?id=tWaUKrjGMEuM3bZvypd0-1JR5WsjulFPvbjl4VXu0Y1UOTcwWldYR1pJQ1RSWTQ2QzBJNjM0VUxUTy4u</p> <ul style="list-style-type: none"> • Read through both pages of the 'Knowledge Organiser' on 'Atoms and the Periodic Table'. • Make careful and detailed notes on Sections 1-7, including writing out the properties of the 'subatomic particles' in Section 1 and of 'metals and non-metals' in Section 4. • Write down the properties of 'Group 1' elements without looking at your earlier notes from Section 5. • Complete the 'Test Yourself' activity; the answers are provided at the end, but do not look at these until you have tried to complete the work yourself (be strict with yourself here). • Complete the 'Periodic Table' exam-style question. Use the mark scheme (once you have tried the question) to mark your answers carefully.
Where do you complete the work?
In Study Books.
What to do if you finish the work? (Extension activity)
<ul style="list-style-type: none"> • Make sure you have completed the previous set work on 'The Human Body - Revision' and then work on the 'Mini Project' on 'Atoms and Elements'.

These websites might help:

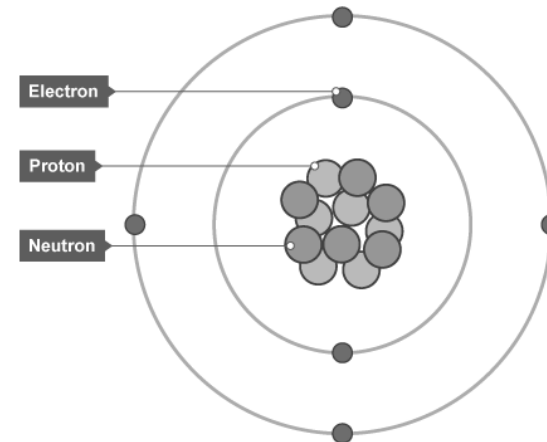
- BBC Bitesize -> Secondary -> KS3 -> Science -> Chemistry -> Atoms, Elements and the Periodic Table

If you are struggling with your work or if you have finished.

Please email your classroom teacher directly using the email list found in the Home Learning section of the website.

1. What is an atom and the structure of an atom.

Everything is made from **atoms**, including you. Atoms are tiny particles that are far too small to see, even with a microscope. If people were the same size as atoms, the entire population of the world would fit into a box about a thousandth of a millimetre across. An atom has a central nucleus. This is surrounded by electrons arranged in shells. The nuclei of all atoms contain subatomic particles called protons. The nuclei of most atoms also contain neutrons.



Subatomic particle	Relative mass	Relative charge
Proton	1	+1
Neutron	1	0
Electron	Very small	-1

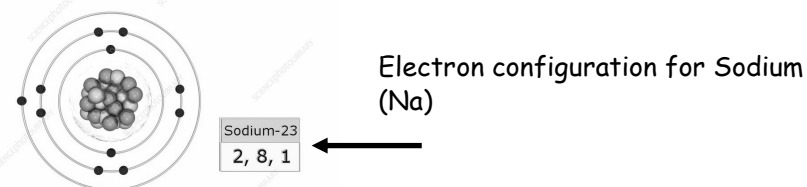
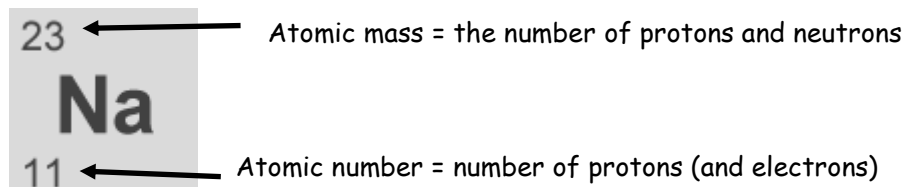
2. Elements

An element is a substance that cannot be broken down into any other substance. Every element is made up of its own type of atom. This is why the chemical elements are all very different from each other.

- Everything in the universe contains the atoms of at least one or more elements.
- The periodic table lists all the known elements and groups together those with similar properties.

The number of protons in an atom of an element is its atomic number. Remember that: all atoms of a given element have the same number of protons, atoms of different elements have different numbers of protons

An atom contains equal numbers of protons and electrons. Since protons and electrons have equal and opposite charges, this means that atoms are have no overall electrical charge.



3. Elements

Element	Symbol	Element	Symbol	Element	Symbol	Element	Symbol	Element	Symbol
Hydrogen	H	Boron	B	Fluorine	F	Aluminium	Al	Chlorine	Cl
Helium	He	Carbon	C	Neon	Ne	Silicon	Si	Argon	Ar
Lithium	Li	Nitrogen	N	Sodium	Na	Phosphorus	P	Potassium	K
Beryllium	Be	Oxygen	O	Magnesium	Mg	Sulfur	S	Calcium	Ca

4. Metals vs Non-metals

▶ Metals
 ▶ Non-metals

Metals	Non-metals
Shiny	Dull
High melting point	Low melting point
Good conductor of electricity	Poor conductor of electricity
Good conductor of heat	Poor conductor of heat
High density	Low density
Malleable and ductile	brittle

5. Group 1

Li Lithium
Na Sodium
K Potassium
Rb Rubidium
Cs Caesium
Fr Francium

↑
 Increasing reactivity as you go down the group
 ↓

Group 1 elements are very reactive. They are stored under oil to keep them away from air and water. Group 1 elements form alkaline solutions when they react with water. This is why they are called alkaline metals.

6. Group 7

F Fluorine
Cl Chlorine
Br Bromine
I Iodine
At Astatine
Ts Tennessine

↓
 Increasing reactivity as you go up the group
 ↑

Chlorine is a green gas and is used to sterilise water.

Bromine is an orange gas and is used to make pesticides and plastics.

Iodine is a grey solid and is used to sterilise wounds.

7. Group 0

He Helium
Ne Neon
Ar Argon
Kr Krypton
Xe Xenon
Rn Radon
Og Oganesson

↓
 Boiling point increases as you go down the group
 ↓

Group 0 elements are called the noble gases. They exist as single atoms. They all have low boiling points.

The Periodic Table Test Yourself

Anagrams

Rearrange the letters to show the properties of metals:

ronsoosu →

tideluc →

mabelleal →

hiyns →

cudtrosnoc →

Group 7

Element	Melting point °C	Boiling point °C	State at room temperature
Fluorine	-220	-188	Gas
Chlorine	-101	-35	Gas
Bromine	-7	59	
Iodine	114	185	Solid

What happens to the melting point as you move down the elements in group 7?

If room temperature was 200 C, what would be the state of bromine?

Displacement Reactions

Complete the displacement reactions for group 7 elements.

chlorine + potassium bromide → _____ + bromine

bromine + _____ → potassium bromide + iodine

Dmitri Mendeleev

In 1869, Dmitri Mendeleev produced an early version of the periodic table.

How did he arrange the order of the elements?

When an element did not fit a pattern, what did he do?

The Periodic Table Test Yourself Answers

Anagrams

Rearrange the letters to show the properties of metals:

ronsoosu → **sonorous**

tideluc → **ductile**

mabelleal → **malleable**

hiyns → **shiny**

cudtrosnoc → **conductors**

Group 7

Element	Melting point °C	Boiling point °C	State at room temperature
Fluorine	-220	-188	Gas
Chlorine	-101	-35	Gas
Bromine	-7	59	Liquid
Iodine	114	185	Solid

What happens to the melting point as you move down the elements in group 7? **Increases**

If room temperature was 200 C, what would be the state of bromine? **Liquid**

Displacement Reactions

Complete the displacement reactions for group 7 elements.

chlorine + potassium bromide → **potassium chloride** + bromine

bromine + **potassium iodide** → potassium bromide + iodine

Dmitri Mendeleev

In 1869, Dmitri Mendeleev produced an early version of the periodic table.

How did he arrange the order of the elements? **By Atomic weight**

When an element did not fit a pattern, what did he do? **He left a gap**

The Periodic Table Exam Style Questions

1. The table below shows information about different elements.

Element	Melting point °C	Boiling point °C	State at room temperature 20°C	Does it conduct electricity?
A	1083	2567	Solid	Yes
B	-218	-183	Gas	No
C	3500	4827	Solid	Yes
D	650	1107	Solid	Yes
E	-272	-268	Gas	No

State the letters of the elements that are likely to be metals:

Which of the elements has the lowest melting point?

Which of the elements has the highest boiling point?

If the elements were heated to 1000°C, which element would be a liquid?

2. Copper is a metal that has many different uses. It is strong and shiny.
Give 2 other properties that would show copper is a metal.

- 1.
- 2.

3. What is the correct symbol for potassium?

Name the element that can be found in group 2, period 3:

4. State 1 use of neon, argon and helium.

- Neon:
- Argon:
- Helium:

The Periodic Table Answers

1. The table below shows information about different elements.

Element	Melting point °C	Boiling point °C	State at room temperature 20°C	Does it conduct electricity?
A	1083	2567	Solid	Yes
B	-218	-183	Gas	No
C	3500	4827	Solid	Yes
D	650	1107	Solid	Yes
E	-272	-268	Gas	No

State the letters of the elements that are likely to be metals: **A, C, D**

Which of the elements has the lowest melting point? **E**

Which of the elements has the highest boiling point? **C**

If the elements were heated to 1000°C, which element would be a liquid? **D**

2. Copper is a metal that has many different uses. it is strong and shiny.
Give 2 other properties that would show copper is a metal.

1. **Malleable or sonorous**
2. **Ductile or conductors of heat and electricity**

3. What is the correct symbol for potassium? **K**

Name the element that can be found in group 2, period 3: **magnesium**

4. State 1 use of neon, argon and helium.

- Neon: **bright lights**
- Argon: **in double glazing**
- Helium: **balloons**

Atoms and Elements

Watch this video: <https://www.youtube.com/watch?v=nxRGahK7B48>

Task	Description
1	Create a decorative cover sheet for your project using pictures and as many keywords from the topic as possible.
2	Draw or print a table to show the similarities and the differences between man-made and natural materials, also include three examples for each
3	Produce a leaflet to show a diagram of atoms of an element such as iron or zinc
4	Draw or print the periodic table and label the sections of metals and the non-metals .Label and name the groups of the periodic table
5	Draw or print a table for ten metal elements with their symbols and ten non-metal elements with their symbols
6	Find the definition of a compound and write down he names of three compounds and state the difference between a compound and a mixture
7	Draw a poster to show the difference between chemical and physical changes. Include an example for each. State how to identify a chemical change.
8	Name different compounds and molecules and list the rules for naming compounds with examples for each.