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Glue on this side

# Elements

1	I can recognise an atomic model. I can label the subatomic particles and identify their relative masses and charges
2	I can describe the differences between atoms, elements and compounds
3	I can represent elements using chemical symbols
4	I can explain what a polymer is

1	atom	The smallest part of an element that can exist.
2	chemical symbol	A one- or two-letter code for an element that is used by scientists in all countries.
3	compound	Pure substances made up of atoms of two or more elements, strongly joined together.
4	element(s)	Substances that all other materials are made up of, and which contain only one type of atom. An element cannot be broken down into other substances.
5	natural polymer	A polymer made by plants or animals. Examples include starch, wool, cotton, and rubber.
6	polymer	A molecule made by joining up thousands of smaller molecules in a repeating pattern. Plastics are synthetic polymers, and starch is a natural polymer.

Prior knowledge from KS2: This is a new topic and has not been covered in KS2. You may have done some investigations on sorting and grouping substances that may be useful in this topic

Future learning:

At GCSE you will learn the periodic table provides chemists with a structured organisation of the known chemical elements from which they can make sense of their physical and chemical properties. The arrangement of elements in the modern periodic table can be explained in terms of atomic structure which provides evidence for the model of a nuclear atom with electrons in energy levels.

Careers:  
Scientist  
Chemist  
Drug development  
Teacher  
Pharmacist

Why?

The historical development of the periodic table and models of atomic structure provide good examples of how scientific ideas and Explanations develop over time as new evidence emerges.

## Elements and atoms

- An **element** is a substance that only contains one type of atom, it is found on the **Periodic Table**
- Each element has its own unique chemical symbol which is the same in every language, these are also found on the Periodic Table
- An **atom** is the smallest part of which an element can be broken down into
- As there are around 100 types of elements that can occur naturally, there are around 100 different atoms

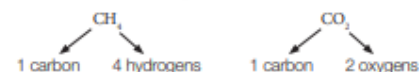
## Polymers

- **Polymers** are long chains of groups of atoms which are repeated many times
- Natural polymers are not man-made and include wool, cotton, starch and rubber
- Synthetic polymers are man-made and include polythene, polystyrene and nylon

## Compounds





- **Compounds** are formed when two or more different elements chemically bond together
- The compound will have different **physical properties** to the elements which make up the compound, for example water is a liquid, but it made from oxygen and hydrogen which are both gases
- Compounds are hard to separate and need a chemical reaction to do this

- When naming a compound, we always mention the metal first and the non metal second
- The name of the metal will not change but the name of the non metal will, for example oxygen can change to oxide
- Chemical formulae tells us how many atoms of each element are in the compound in relation to each other



- The small number tells us the number of each element which is in front of the number

Complete some of the tasks below to reach a total of \_\_\_\_\_ points over this unit of work – Highlight the box once completed.

Topic	1 Point	2 Points	4 Points	6 Points	10 Points
Elements 	Make a list of 10 different elements	Create two truths and one lie about elements	Write down some of the dangers from the practicals in today's lesson, and how we can prevent those dangers	'Glass is an element'. Is this correct? Justify your answer	Research the history of the elements. Who had the first ideas? How have the ideas of what an element is changed over time?
Atoms 	Draw a diagram to show the difference between a single atom and a molecule	Create a glossary with pictures of keywords from today's lesson.	Explain how atoms and elements are related	Research what the current model of an atom looks like, then draw and label it.	Research what electrolysis is. Draw a diagram and write a small paragraph explaining what it is and how it works.
Compounds 	Draw a diagram to show the difference between a single atom, a molecule and a compound.	Write a paragraph to compare the differences between elements, atoms and compounds	Draw a diagram of a molecule and a compound, and explain how they are different	'Write an information leaflet about what a compound is. You must write as though you are explaining it to someone who knows nothing about chemistry. Make sure to talk about elements, atoms and bonds.	Research some different types of compounds that are common in everyday life and write down what elements make them up.
Chemical formulae 	Write down the chemical symbol (use the periodic table) for: Iron, Gold, Neon, Carbon	Create a flowchart for how to find the chemical formula of a compound.	Create a poem to help you remember how to decide the chemical formula of a compound	Plan a three course meal, where everything is a mixture of elements, and compounds. Try and write the chemical formula for each element and compound	Research the common errors made when people decide on the chemical formula of a compound. Give some examples.

