Subject

Year 7: Atoms, elements and compounds

Assessment Opportunities	Literacy/Reading opportunities	CEIAG Links
• Regular low stakes quizzing of AO1- self marked. • Extended writing is teacher marked with personalised feedback provided. • End of unit assessment self & teacher marked with collective feedback provided.	**Reciprocal reading: The discovery of radioactivity by Marie Curie** **Key vocab is highlighted in the SOL**	**Spotlight on careers:** Chemical Engineer Other careers: • Pharmacist • Materials scientist • Analytical chemist • Environmental scientist

Curriculum vision:

"Our aim is to deliver a curriculum that is inclusive, relevant and progressive for all learners."

KS3 Atoms, elements and compounds

Big Picture:
Understanding the relationships and interactions between atoms, elements, and compounds provides a foundational framework for comprehending the behaviour of matter in various physical, chemical, and biological contexts. This knowledge is essential not only in basic science education but also in fields ranging from materials science to environmental studies and beyond.

Lesson sequence	**Learning outcomes / Key knowledge (including NC KS3)** Scaffold	**Skills development:** Reading / writing / data / numeracy / graph work	**Spec / book reference**
1. **TBAT:** Describe what an atom is	Students will be able to accurately define an atom as the basic unit of a chemical element. Different atoms are called elements and are found on the periodic table ○ Use visual aids like diagrams and videos. ○ Provide knowledge organisers / key vocab with definitions	• **Describe what an atom is** • **Explain why an individual atom cannot be a solid, liquid or gas**	**Spec** **NC pos here** **Boost book 3**
2. **TBAT:** Describe the structure of an atom	• Students will be able to identify and describe the three main subatomic particles of an atom: protons, neutrons, and electrons. • Students will be able to explain the arrangement of protons and neutrons in the nucleus and the distribution of electrons in the electron shells around the nucleus. • Students will be able to define and distinguish between atomic number (number of protons) and mass number (sum of protons and neutrons) in an atom. ○ Larger text chunked as needed. ○ Video and visual aids used ○ Plasticine used to make models of atoms	• **Reciprocal reading** Discovering the structure of DNA	**Spec** **NC pos here** **pg7** **Boost book 3 pg 50**
3. **TBAT:** Identify elements and their symbols	• Students will be able to recognize and correctly write the chemical symbols for common elements on the periodic table. • Students will be able to match chemical symbols to their corresponding elements accurately. • Students will be able to explain the notation of element symbols, including why some symbols do not match the English names (e.g., Na for sodium).	• **Identify:** Symbols to chemical names • **Explain:** Why we need symbols •	**Spec** **NC pos here** **Boost book 3**

	○ Images / dual coding		
4. **TBAT:** Identify properties of metals and non-metals	• Students will be able to differentiate between the physical properties of metals (such as luster, malleability, and conductivity) and non-metals (such as brittleness, dullness, and poor conductivity). • Students will be able to classify given examples of elements as metals or non-metals based on their properties. ○ Have materials ready to demonstrate properties for visual aid	• **Identify:** Metals and non-metals from their properties • **Describe:** the meaning of different properties e.g – malleable, brittle • **Match:** The property to it's definition	**Spec NC pos here** **Boost book 3**
5. **TBAT:** Identify elements and compounds from particle diagrams	○ Students will be able to identify particle diagrams that represent elements by recognizing single types of atoms grouped together. ○ Students will be able to distinguish particle diagrams that represent compounds by recognizing groups of different types of atoms bonded together. ○ Students will be able to interpret the arrangement of particles in diagrams to determine whether a substance is an element or a compound. ○ Burning magnesium to show magnesium oxide ○ Particle diagrams for visual aids	• **Describe:** What a compound is • **Identify:** Elements and compounds from particle diagrams	**Spec NC pos here** **Boost book 3**
6. **TBAT:** Describe how Iron sulfide is formed	• Students will be able to explain that iron sulfide is formed from the chemical reaction between iron (Fe) and sulfur (S). • Students will be able to describe the process of forming iron sulfide, including the reaction equation: Fe + S → FeS. • Students will be able to outline the steps involved in the reaction, such as mixing iron and sulfur and heating the mixture to initiate the formation of iron sulfide. ○ Use images & dual coding ○ Demo making iron sulfide as visual aid	• **Name:** The elements in iron sulfide • **Identify:** elements and compounds from particle diagrams • **Explain:** Why you can separate iron from a mixture of iron and sulfur but not in iron sulfide	**Spec NC pos here pg7** **Boost book 3**

7. **TBAT:** Distinguish between a compound and mixture	○ Students will be able to identify that a compound consists of two or more elements chemically bonded in fixed proportions, while a mixture consists of two or more substances physically combined in variable proportions. ○ Students will be able to compare the properties of compounds and mixtures, noting that compounds have unique properties different from their constituent elements, whereas mixtures retain the properties of their individual components. ○ Use visual aids and clear, concrete examples ○ Simplify the explanation of mechanisms with diagrams ○	• **Describe:** separation methods • **Compare:** Properties of compounds and mixtures	**Spec NC pos here pg7** **Boost book 3**
8. **TBAT:** Write chemical formula	○ Students will be able to identify and write the correct chemical formulas for simple ionic and molecular compounds ○ Use historical and contemporary examples to illustrate concepts	• **Identify:** Elements symbols • **Determine:** Compound formula • **Identify:** metals and non-metal elements	**Spec NC pos here pg7** **Boost book 3**
9. **TBAT:** Name compounds	• Students will be able to name common ionic and covalent compounds by recognising the elements involved and applying basic naming conventions. • Metal and non-metals end in 'ide' • Metal, oxygen and non-metal ends in 'ate' • ○ Use images with dual coding ○ Use well known examples	• **Identify :** Common compound formula • **Write:** Names from formula • **Apply:** Suffixes such as 'ide' and 'ate'	**Spec NC pos here pg7** **Boost book 3**
10. **TBAT: engage with a scientific article**	○ Students will be able to identify and summarize the main objectives and conclusions of a scientific article, demonstrating an understanding of the structure and content typical of scientific papers. ○ Identify any words not understood and write a glossary ○ Use images with dual coding ○ Read with reading rulers with class	• **Identify:** Unusual words • **Summarise:** The article in two sentences •	**Spec NC pos here pg7** **Boost book 3 pg 70-71**

11. Extend writing skills	• Explain the differences between an element, compound and mixture ○ Key words to use provided ○ Pictures for dual coding	• **Identify:** Key words in your writing	

Vocab	**Links to previous learning / interleaving**	**Assessment & homework**
L3 Vocab Electron Proton Neutron Nucleus Atomic number Periodic table Metal Non-Metal Compound Chemical bond Molecule **L2 Vocab** Compound Mixture Formula Atom Element Symbol Property Heat Reaction **Command words focus** Label Plot Measure Predict Identify Estimate Observe Justify Evaluate Compare construct	**KS3 Particle model** ○ Solid, liquids and gases ○ Density ○ Metals and non-metals ○ Properties **KS2** ○ Solid, liquid and gases ○ Metals and non-metals ○ Common elements	• Regular low stakes quizzing of AO1 • In class assessment of AO1, AO2, AO3 using past paper questions where appropriate • Written word is assessed with personalised feedback provided. • End of unit assessment marked with collective feedback provided. Homework is set weekly and is outlined in the half-termly homework booklet. Homework includes • online quizzes on Carousel • Learning of content for in-class quizzes • Completion of written questions.

Independent learning	**Misconceptions / common errors**
BBC Bitesize KS3 – atoms, elements and compounds Atoms, elements and compounds - KS3 Chemistry - BBC Bitesize YouTube revision monkey KS3 Structure of an atom: Structure of the atom - YouTube Atoms, elements and compounds: Atoms, Elements, Compounds and Mixtures (youtube.com) Metals and non-metals: Metals and Non-metals (youtube.com)	○ Atoms are the smallest particles of matter. ○ All atoms of the same element are identical. ○ Electrons are located in a fixed orbit around the nucleus like planets around the sun. ○ All metals are solid at room temperature.

	○ All substances that are mixed together are compounds. ○ Compounds always have properties similar to the elements they are made from.