Learning Journey – 9A Building Blocks - Atoms

What have I done previously in my learning journey?	
Previously….	You have learnt previously about particles. This has involved: • Describing the properties of different states of matter. You have also learnt about atoms. This has involved: • Describing a simple model of the atom • Describing differences between atoms, elements and compounds.
In this topic…	You will learn more about atoms as the building blocks of all states of matter. This will include: • Describing how the model of the atoms has changed over time as new evidence has become available. • Calculating the numbers of the different sub-atomic particles in an atom. • Linking the position of an element on the periodic table to its atomic structure.

We will develop our learning by studying the following each lesson:	RAG	Skills in Science checklist
9A.10 Introduction to Atoms • Name examples of atoms and elements • Represent elements using chemical symbols • Explain how elements are arranged in the periodic table		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
9A.11 Inside the Atom • Calculate the numbers of protons, electrons and neutrons in an atom • State the charge and relative masses of protons, electrons and neutrons • State the distribution of mass in an atom • Describe the overall charge of an atom		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
9A.12 Isotopes • I can describe isotopes as atoms of the same element with different numbers of neutrons • I can define relative atomic mass • I can calculate relative atomic mass		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
9A.13 Electron Shells • Describe how electrons fill energy levels in atoms. • Represent the electronic structure of elements using diagrams and numbers. • Apply knowledge to questions.		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
9A.14 The Atomic Model • Describe how the atomic model has changed over time due to new experimental evidence including the discovery of the atom and scattering experiments (including the work of James Chadwick) • Describe the difference between the plum pudding model of the atom and the nuclear model of the atom		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
9A.15 States of Matter • Name the three states of matter • Explain changes of state using particle theory • Describe factors affecting the melting point and boiling point of a substance		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
9A.16 Mixtures • Define a mixture • Identify soluble and insoluble substances • Identify solvents and solutes		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
9A.17 Chemical Equations ● Recall what (s), (l), (g) and (aq) mean when used in a chemical equation and be able to use them ● Write word equations and balanced symbol equations for chemical reactions, including using appropriate state symbols.		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication

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9A.18 Molecules • Describe that atoms can be chemically joined together to form big molecules. • State examples of big molecules which are important in biological systems		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication

Key Vocabulary

Atom	**Element**	**Symbol**	**Proton**	**Neutron**	**Electron**	**Mass**	**Charge**	**Isotope**
Relative atomic mass	**Energy level**	**Atomic model**	**Plum pudding model**	**Alpha scattering**	**Nuclear model**	**Particle theory**	**State of matter**	**Melting point**
Boilng point	**Mixture**	**Soluble**	**Insoluble**	**Solvent**	**Solute**	**Solid**	**Liquid**	**Gas**
Aqueous	**State symbol**	**Molecule**						

Future Learning	You will learn that 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. 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.
In careers	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. This provides opportunities for the development of new substances with particular properties and supports development of new technologies