NHSG Key Stage 3 Unit Overview for Y7 Science: Atoms and Elements

Scheme of Learning	Y7 Science: Atoms and Elements
Learning Objectives	1. Explain what is meant by the following key terms: • Atom • Element • Compound • Mixture • Molecule 2. Identify the location of electrons, protons and neutrons in an atom. 3. Navigate the Periodic Table and identify some of the elements. 4. Recognise that the number of protons indicates the element. 5. Describe the properties of metals and non-metals. 6. Identify the region of the periodic table where metals and non-metals are. 7. Interpret particle diagrams of elements, compounds and mixtures. 8. Analyse simple chemical formulae to identify the type and numbers of atoms present 9. Use scientific language to describe physical properties of materials. 10. Apply the scientific method to solve problems 11. Understand the correct way to draw graphs
Key Question	What are the fundamental building blocks of all matter in the Universe? How does these building blocks come together?
Knowledge	Identifying the difference between atoms, elements, compounds, mixtures and molecules. Applying scientific method to problem solving, carrying out a scientific experiment. Understanding the periodic table, how to navigate and interpret it. Graph skills are reviewed and developed.
Ongoing Assessment	Retrieval questions at the start of every lesson. Worksheets for all major concepts to be used for self and peer assessment. Key misconceptions – use of upper and lowercase symbols for elements and compounds. Use of brackets for complex ions. Limitations of the models are discussed. Homework to consolidate learning and develop technical skills.

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	Revision checklist at beginning of handout pack and retrieval questions at the end.
Key Assessment	Assessment of drawing different graphs to demonstrate properties of materials and identify trends and patterns. End of topic test, 30 marks in 35 minutes. Including a mixture of MCQ, short answer and long answer questions. With mark schemes moderated by the team, with notes on standardised language.
Clear sequencing of content	The first Chemistry topic in KS3 of atoms and elements a key topic to introduce chemistry which uses principles needed to build on future topics. These key concepts are also revisited at the start of GCSE in greater depth and therefore learning the concepts now gives them prior exposure to aid the transition to KS4. The understanding of this topic aids the understanding of many other topics in both KS3 and KS4.
Link to careers	All science related employment requires a deep understanding of the basics of chemistry.
Diversity and Inclusion	Acharya Kanada, also known as Kashyapa, an ancient Indian natural scientist and philosopher, formulated the theory of atoms 2500 years before John Dalton's discovery. The school founded by Kanada explains the creation and existence of the universe by proposing an atomistic theory, applying logic and realism. Ida Tacke made huge advances in both chemistry and atomic physics. In 1925, it was she who managed to find two new elements, rhenium and masurium, that Dmitri Mendeleev had predicted would form part of the periodic table. Marie Maynard Daly was the first African-American Woman to earn a chemistry PhD from Colombia University in 1947.
Support	Learning checklist and key terminology are highlighted throughout. Online textbook via Kerboodle includes working scientifically, glossary and literacy support. Adaptive teaching in the classroom supports all learners.
Challenge	Stretch challenge question on end of topic test inviting students to apply their knowledge in a complex situation. Stretch and challenge question sheet.

	A challenging thought for discussion – Baryonic matter (Periodic Table) v Dark Matter (links to GCSE astronomy and A-level physics).