Year 9
Subject: Chemistry
Topic/Unit: Atomic Structure and the Periodic Table
When: Half Term 1 and Half Term 3

Huntington School
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Overview: Why this? Why now?
This unit provides the **fundamental building blocks** of chemistry by exploring the nature of matter. Understanding how atoms are structured and how elements are organised in the Periodic Table is essential before students can progress to complex chemical bonding and reactions.

Building on...building to:
This unit builds on earlier concepts of particles and basic chemical reactions. It serves as a foundation for studying **chemical bonding, quantitative chemistry, and the properties of materials** in subsequent terms.

Sequence summary:
- **Fundamental Principles:** Students define **atoms, elements, and compounds**. They learn to represent chemical changes using **balanced symbol equations**, adhering to the **law of conservation of mass**.
- **The Evolving Atom:** The unit tracks the history of atomic theory, moving from Dalton's solid spheres to the discovery of subatomic particles by Thomson, Rutherford, Bohr, and Chadwick.
- **Subatomic Structure:** Lessons focus on the properties of **protons, neutrons, and electrons**, including mass, charge, and the calculation of atomic and mass numbers. Students practice drawing **electronic structures** in energy levels/shells.
- **The Periodic Table:** Analysis of the table's history, specifically **Mendeleev's decision to leave gaps** for undiscovered elements. Students explore modern trends in **Group 1 (Alkali metals)**, **Group 7 (Halogens)**, and **Group 0 (Noble gases)**.
- **Matter and Mixtures:** The unit concludes with **particle theory** to explain states of matter and changes of state. Students learn to separate mixtures through **physical methods** such as filtration, distillation, and chromatography.

Key Vocabulary:
Atom, Element, Compound, Isotope, Relative Atomic Mass, Nucleus, Electron Shell, Halogen, Alkali Metal, Noble Gas, Conservation of Mass, Distillation, Chromatography.

Assessments:
- **Formative:** Regular "Do Now" retrieval tasks and whiteboard exercises on balancing equations.
- **Summative:** A mid-unit quiz on atomic history and a formal end-of-unit assessment covering periodic trends and separation techniques.

Able and interested:
Students will explore **quantum mechanical models** (Schrödinger) and analyse complex displacement reactions using ionic equations.

Inclusion, Personal Development and Wider Skills:
Visual models and particle diagrams support diverse learners. The history of the Periodic Table highlights the **collaborative and evolving nature of scientific discovery**.

Homework and Independent Learning:
Students will complete a task set on the SPARX online platform. The task is based on the current topic but also includes consolidation on previous topics. It will automatically adjust the level of challenge as the student complete the activities.