# NHSG Key Stage 3 Unit Overview for Y7 Science: Particles and Solutions

| Scheme of Learning | Y7 Science: Particles and Solutions |
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| **Learning Objectives** | 1. Describe the states of matter in terms of particles & their movement<br>2. Describe state changes in relation to kinetic energy of particles<br>3. Types of variable (independent, dependent, control) and rules for constructing tables of data<br>4. Graph drawing – continuous and categoric data - lines of best fit<br>5. Density – explained using particle theory<br>6. Solutions – understanding keywords, explaining dissolving using particle model<br>7. Purifying rock salt – simple use of dissolving, filtration and evaporation<br>8. Distillation<br>9. Chromatography<br>10. Consolidation and review |
| **Key Question** | How do particles of substances behave and how can different substances be separated |
| **Knowledge** | Appreciation and application of the Scientific Model.<br>Understand the kinetic theory of matter.<br>Understand how science presents and displays data.<br>Understand how mixtures can be separated. |
| **Ongoing Assessment** | Retrieval questions at the start of every lesson.<br>Worksheets for all major concepts to be used for self and peer assessment.<br>Revision checklist at beginning of handout pack and retrieval questions at the end.<br>Homework to consolidate skills. |
| **Key Assessment** | Assessment of different types of graphs to identify behaviour of different substances.<br>End of topic test, 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 second chemistry topic in KS3 deals with the pure substances made from the atoms and elements looked at earlier. The concepts from this topic will be built upon in future topics.<br>These key concepts are also revisited at GCSE and therefore learning the concepts now gives them prior exposure to aid the transition to KS4.<br>The vocabulary used here is examined at GCSE without too much additional material. |

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| **Link to careers** | Chemical Analysts employ the use of gas chromatography and mass spectroscopy GC-MS to identify compounds in a wide range of mixtures – blood, urine, food, as key contexts. |
| **Diversity and Inclusion** | Include references to alchemical routes of separation and purification that led to modern scientific techniques |
| **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 to incorporate deeper application and explanation given the skills and language of particles.<br>Stretch and challenge question sheet. Thought – how are electrons, protons and neutrons built themselves? Where do they originate? (Links GCSE Astronomy, Physics.) What is plasma and Bose-Einstein condensate? |