



Scheme of Learning Title: Cell Structures			Year 9: Purity and Separating Mixtures		
Learning Outcomes			Subject content:		Skill set:
			Knowledge and understanding of <ul style="list-style-type: none"> The concept of a pure substance How to separate simple mixtures How to identify pure substances, in terms of melting point, boiling point and chromatography 		<ul style="list-style-type: none"> use models to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts use scientific theories and explanations to develop hypotheses plan experiments or devise procedures to make observations, produce or characterise substance, test hypotheses, check data or explore phenomena apply a knowledge of a range of techniques, instruments, apparatus and materials to select those appropriate to the experiment carrying out and representing mathematical and statistical analysis use scientific vocabulary, terminology and definitions use SI units and IUPAC chemical nomenclature unless inappropriate
Key Question			How are particles arranged in different states of matter? What is an element? How is the atom structured?		
Knowledge			Key concepts and skills		Key terminology
			<ul style="list-style-type: none"> Defining the terms <i>relative atomic mass</i>, <i>relative formula mass</i>, and <i>relative molecular mass</i> Calculating the relative formula masses from formulae and balanced equations Calculate the empirical formula of a compound Explain what purity means, and that many useful things are mixtures Explain how to use melting point to distinguish pure from impure substances 		<ul style="list-style-type: none"> ➤ relative atomic mass ➤ relative formula mass ➤ relative molecular mass ➤ empirical formula ➤ compound ➤ pure ➤ impure ➤ filtration ➤ crystallisation

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	<ul style="list-style-type: none"> Describe and explain how different purification methods work, including filtration, crystallisation, simple distillation, and fractional distillation Suggest suitable purification methods Explain how different chromatography methods work Calculate Rf values from chromatograms Suggest suitable chromatography methods to distinguish pure from impure substances 	<ul style="list-style-type: none"> distillation fractional distillation chromatography thin-layer chromatography gas chromatography
Ongoing Assessment	<p>Retrieval questions at the start of every lesson. These questions refer to previous knowledge of atoms, elements and compounds from Y7 and 8 which will help them develop further knowledge in Y9.</p> <p>Assessment in the form of questions and tasks in the topic book, including</p> <ul style="list-style-type: none"> Relative formula mass Empirical and molecular formula 6 mark question – Methods of separating mixtures Successful separations <p>Key misconceptions:</p> <ul style="list-style-type: none"> Learners commonly misuse the word pure and confuse it with natural substances or a substance that has not been tampered with. They think that when a substance dissolves that the solution is pure and not a mixture. <p>Homeworks:</p> <ul style="list-style-type: none"> Purification Techniques worksheet Rf values worksheet Complete the key terms The Atom worksheet Exam style questions <p>Revision checklist: Specification used as revision checklist in front of topic booklet. Knowledge organisers review topic on one/two pages.</p>	

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Final Assessment	<p>Practical assessment: Class practicals to purify and separate mixtures, personalised feedback, including safe practice and accurate use of equipment.</p> <p>End of topic test. Closed book 30 marks in 30 minutes.</p> <p>Test will assess key skills and content from specification of this unit, using past GCSE style questions.</p> <p>The test includes multiple choice questions, practical knowledge question and mathematical application.</p>
Clear sequencing of content	<p>This is the second Chemistry topic in Y9. It recaps and builds upon some of the concepts covered at Y7 and Y8 such as particles, Particle Model, Elements, compounds and mixtures.</p> <p>The concepts from this topic will be built upon in future Y9 topics such as Chemical reactions and Predicting and Identifying Reactions.</p> <p>The concepts from this topic also underpin many topics and skills used throughout the GCSE and A-level Chemistry.</p>
Links to Careers	<p>Opportunities to discuss the importance of H&S and safe working practices, including the need for a risk assessment, that are essential in many careers.</p>
Diversity and Inclusion	<p>Science in the medieval Islamic world was the science developed and practised during the Islamic Golden Age.</p> <p>Alchemy was a philosophical and protoscientific tradition practiced throughout Europe, Egypt and Asia. It aimed to purify, mature, and perfect certain objects. The start of Western alchemy may generally be traced to ancient Egypt, where the city of Alexandria was a centre of alchemical knowledge, and retained its pre-eminence through most of the Greek and Roman periods.</p> <p>Discussion facilitated by test cover sheet.</p>
Support	<p>Every student receives topic booklets including specification.</p> <p>Knowledge Organiser shared.</p> <p>Retrieval questions available for the start of each lesson.</p> <p>Remote Learning Guide for each lesson is available on SharePoint with links to Bitesize videos.</p> <p>OUP GCSE Chemistry textbook on Kerboodle for all.</p> <p>Chemistry Drop-in club for support – voluntary and guided intervention</p>

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	Some students are provided with CGP revision guides and workbooks.
Challenge	Stretch and Challenge Articles with questions to go alongside are provided at the back of the topic booklet: The Hip New Joint in Town