

Year 10 Curriculum Map : Chemistry

Assessment Objectives	<p>AO1 - Demonstrate knowledge and understanding of: scientific ideas; scientific techniques and procedures (40%)</p> <p>AO2 - Apply knowledge and understanding of: scientific ideas; scientific enquiry, techniques and procedures. (40%)</p> <p>AO3 - Analyse information and ideas to: interpret and evaluate; make judgements and draw conclusions; develop and improve experimental procedures. (20%)</p>
Unit Length	<p>Topic: C1 – Atomic structure and periodic table – 16/17 lessons (Autumn term)</p>
Key Learning Outcomes	<ol style="list-style-type: none"> 1. Chemical formulae and equations 2. Balancing equations 3. Separating techniques 4. Development of the atomic model 5. Structure of the atom 6. Isotopes 7. <i>Progress assessment</i> 8. <i>Reteach and DIRT</i> 9. Development of the periodic table 10. Metals and non-metals 11. Group 1 12. Group 7 and group 0 13. Group 7 displacement reactions 14. Transition metals (TRIPLE ONLY) 15. <i>Revision</i> 16. <i>End of unit assessment</i> 17. <i>Reteach and DIRT</i>
Prior knowledge	<p>Year 7:</p> <ul style="list-style-type: none"> - Simple techniques for separating mixtures - The identification of pure substances - Atoms, elements and compounds - Word and symbol equations <p>Year 8:</p> <ul style="list-style-type: none"> - The varying physical and chemical properties of different elements - The properties of metals and non-metals - Structure of the atom and electronic structure - Development of the periodic table - Groups 1, 7 and 0

	<ul style="list-style-type: none"> - Displacement reactions <p>Year 9:</p> <ul style="list-style-type: none"> - Pure substances and formulations - Metallic bonding and alloys - Chromatography
CEIAG Specific careers links	<p>Research scientist Chemical engineering Forensic scientist Formulations chemist Toxicologist Pharmaceutical chemist Materials scientist</p>
RRSA	<p>Article 14: Freedom of thought, belief and religion Article 24: Health and the Health services Article 28: Right to education Article 29: Goals of education Article 27: Adequate standard of living</p>
Cross curricular links	<p>DT – Properties of materials Maths – Calculating Rf values, comparing boiling points and melting points, calculation isotopic abundance, balancing equations Physics – Particle model of matter, development of the atomic model, isotopes</p>
Useful websites/ videos	<p>Most expensive metals: https://www.youtube.com/watch?v=VBGYQ51my5c&t=18s</p> <p>2400 year search for the atom: https://www.youtube.com/watch?v=xazQRcSCRaY&t=3s</p> <p>Carbon dating (isotopes): https://www.youtube.com/watch?v=phZeE7Att_s</p> <p>Titanium implants (transition metals): https://www.youtube.com/watch?v=lJiznlz5buc</p>

	Colours of the noble gases: https://www.youtube.com/watch?v=IjznIz5buc
Wider Reading	Uses of alloys Genius of Mendeleev and predicting elements Danger of chlorine gas Discovery of neutrons
Literacy Programme	<ul style="list-style-type: none"> • Decode it NOW • Guided practice/model answers • Sentence Starters • Writing strategies
Independent Learning Tasks	Mind-map revision homework Retrieval practice homework Knowledge Organiser practice questions Selective reading activity Seneca quiz ILT

Unit Length	Topic: C2 – Structure and bonding – 12/13 lessons (Autumn/Spring term)
Key Learning Outcomes	<ol style="list-style-type: none"> 1. Ionic bonding and compounds 2. Covalent bonding and compounds 3. Comparing ionic and covalent compounds 4. Giant covalent compounds 5. Polymers 6. <i>Progress assessment</i> 7. <i>Reteach and DIRT</i> 8. Metals and alloys 9. Properties of substances 10. Nanoparticles (TRIPLE ONLY) 11. <i>Revision</i> 12. <i>End of unit assessment</i> 13. <i>Reteach and DIRT</i>

Prior knowledge	<p>Year 7:</p> <ul style="list-style-type: none"> - Atoms, elements and compounds - Word and symbol equations - Particle model of matter and changes of state <p>Year 8:</p> <ul style="list-style-type: none"> - The varying physical and chemical properties of different elements - The properties of metals and non-metals - Atomic structure and electronic structure <p>Year 9:</p> <ul style="list-style-type: none"> - Properties of substances and states of matter - Ionic, covalent and metallic bonding - Properties of ionic, covalent and metallic compounds
CEIAG Specific careers links	<p>Research scientist Chemical engineering Polymer chemist Formulations chemist Pharmaceutical chemist Materials scientist Nanoscience and nanotechnology</p>
RRSA	<p>Article 14: Freedom of thought, belief and religion Article 24: Health and the Health services Article 28: Right to education Article 29: Goals of education Article 27: Adequate standard of living</p>
Cross curricular links	<p>DT – Properties of materials, polymers Maths – Comparing boiling points and melting points Physics – Particle model of matter</p>
Useful websites/ videos	<p>Blood diamonds: https://www.youtube.com/watch?v=KH0QC94MTos</p> <p>Lab grown diamonds:</p>

	https://www.youtube.com/watch?v=aHWzXWpHzf8 Graphene – the next big thing: https://www.youtube.com/watch?v=Mcg9 ML2mXY Diverse world of polymers: https://www.youtube.com/watch?v=UwRVj9rz2QQ
Wider Reading	History of blood diamonds Lab grown diamonds vs mined diamonds Polymers in our daily life How plastic changed the world Tungsten – the strongest metal on Earth Lead poisoning
Literacy Programme	<ul style="list-style-type: none"> • Decode it NOW • Guided practice/model answers • Sentence Starters • Writing strategies
Independent Learning Tasks	Mind-map revision homework Retrieval practice homework Knowledge Organiser practice questions Selective reading activity Seneca quiz ILT

Unit Length	Topic: C4 – Chemical changes – 16-19 lessons (Spring/summer term)
Key Learning Outcomes	<ol style="list-style-type: none"> 1. Metal oxides 2. Reactivity series and displacement reactions 3. Extraction of metals 4. Oxidation and reduction (HT/TRIPLE ONLY) 5. Reactions of acids and metals 6. pH scale and neutralisation 7. Soluble salts 8. Making copper sulphate (required practical) 9. Titration (TRIPLE ONLY) 10. Strong and weak acids (HT/TRIPLE ONLY)

Key Learning Outcomes	<p>11. <i>Progress assessment</i></p> <p>12. <i>Reteach and DIRT</i></p> <p>13. Electrolysis of molten compounds</p> <p>14. Electrolysis of aluminium oxide</p> <p>15. Electrolysis of aqueous solutions</p> <p>16. Electrolysis (required practical)</p> <p>17. <i>Revision</i></p> <p>18. <i>End of unit assessment</i></p> <p>19. <i>Reteach and DIRT</i></p>
Prior knowledge	<p>Year 7:</p> <ul style="list-style-type: none"> - Atoms, elements and compounds - Word and symbol equations <p>Year 8:</p> <ul style="list-style-type: none"> - The properties of metals and non-metals - pH and neutralisation - Making salts - Reactions of metals with water, acids and oxygen - Metal displacement reactions - Extracting metals - Electrical circuits (physics content) <p>Year 9:</p> <ul style="list-style-type: none"> - Properties of substances
CEIAG Specific careers links	<p>Research scientist</p> <p>Chemical engineering</p> <p>Materials scientist</p> <p>Mining industry</p> <p>Metallurgist</p> <p>Welder</p>
RRSA	<p>Article 14: Freedom of thought, belief and religion</p> <p>Article 24: Health and the Health services</p> <p>Article 28: Right to education</p>

	<p>Article 29: Goals of education</p> <p>Article 27: Adequate standard of living</p>
Cross curricular links	<p>DT – Properties of materials, extracting metal from the ground</p> <p>Maths – Concentration calculations</p> <p>Physics – Particle model of matter</p> <p>Geography – Impact of mining</p>
Useful websites/ videos	<p>Extraction of iron ore: https://www.youtube.com/watch?v=fxBlgbRT8fw</p> <p>Aluminium oxide electrolysis: https://www.youtube.com/watch?v=mvdHeYI-a00</p> <p>Soluble salts required practical: https://www.youtube.com/watch?v=mvdHeYI-a00</p> <p>Electrolysis required practical: https://www.youtube.com/watch?v=tCHE_7QeRUc</p> <p>Titration required practical: https://www.youtube.com/watch?v=tCHE_7QeRUc</p> <p>Railroad thermite welding: https://www.youtube.com/watch?v=tCHE_7QeRUc</p>
Wider Reading	<p>Environmental and economic impacts of mining</p> <p>Mining iron ore in Australia</p> <p>Use of copper sulphate as fertiliser</p> <p>Alternative ways of extracting metals from the ground</p>
Literacy Programme	<ul style="list-style-type: none"> • Decode it NOW • Guided practice/model answers • Sentence Starters • Writing strategies

Independent Learning Tasks	Mind-map revision homework Retrieval practice homework Knowledge Organiser practice questions Selective reading activity Seneca quiz ILT
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Unit Length	Topic: C5 – Energy changes – 6-7 lessons (Spring/summer term)
Key Learning Outcomes	<ol style="list-style-type: none"> 1. Endothermic and exothermic reactions 2. Reaction profiles 3. Investigating energy changes (required practical) 4. Investigating energy changes (analysis) 5. Bond energies (HT/TRIPLE ONLY) 6. <i>Progress assessment (no formal EOU as unit is so small – C5 content will be assessed in mock exam at the end of the year)</i> 7. <i>Reteach and DIRT</i>
Prior knowledge	<p>Year 8:</p> <ul style="list-style-type: none"> - pH and neutralisation <p>Year 9:</p> <ul style="list-style-type: none"> - Chemical and physical reactions - Endothermic and exothermic reactions
CEIAG Specific careers links	Research scientist Chemical engineering Materials scientist
RRSA	Article 14: Freedom of thought, belief and religion Article 24: Health and the Health services Article 28: Right to education Article 29: Goals of education Article 27: Adequate standard of living

Cross curricular links	Maths – Drawing reaction profiles Physics – Energy
Useful websites/ videos	Temperature change required practical: https://www.youtube.com/watch?v=tKxcQYZ2YH8 Bond energy calculations: https://www.youtube.com/watch?v=eExCBkp4jB4 https://www.youtube.com/watch?v=PdValXAVUOc
Wider Reading	Uses of endothermic and exothermic reactions
Literacy Programme	<ul style="list-style-type: none"> • Decode it NOW • Guided practice/model answers • Sentence Starters • Writing strategies
Independent Learning Tasks	Mind-map revision homework Retrieval practice homework Knowledge Organiser practice questions Selective reading activity Seneca quiz ILT

Unit Length	Topic: C3 – Quantitative chemistry – 7-13 lessons (Summer term)
Key Learning Outcomes	<ol style="list-style-type: none"> 1. Conservation of mass 2. Relative formula mass 3. Mass changes when gases are in reactions 4. Moles (HT/TRIPLE ONLY) 5. Amounts of substances in equations (HT/TRIPLE ONLY) 6. Limiting reactants (HT/TRIPLE ONLY) 7. Concentration of solutions 8. Titration calculations (TRIPLE ONLY) 9. Chemical measurements and uncertainty 10. Percentage yield and atom economy (TRIPLE ONLY)

	<p>11. Amounts of substances in volumes of gases (TRIPLE ONLY)</p> <p>12. Progress assessment (no formal EOU as unit is so small – C5 content will be assessed in mock exam at the end of the year)</p> <p>13. Reteach and DIRT</p>
Prior knowledge	<p>Year 7:</p> <ul style="list-style-type: none"> - Conservation of mass <p>Year 8:</p> <ul style="list-style-type: none"> - Word and symbol equations - Atomic structure and mass number <p>Year 9:</p> <ul style="list-style-type: none"> - Chemical and physical reactions
CEIAG Specific careers links	<p>Research scientist</p> <p>Chemical engineering</p> <p>Materials scientist</p> <p>Medicinal chemistry and pharmaceuticals</p> <p>Lean manufacturing</p>
RRSA	<p>Article 14: Freedom of thought, belief and religion</p> <p>Article 24: Health and the Health services</p> <p>Article 28: Right to education</p> <p>Article 29: Goals of education</p> <p>Article 27: Adequate standard of living</p>
Cross curricular links	<p>Maths – Concentration calculations, moles calculations, use of units, percentage atom economy</p> <p>Physics – link to conservation of energy, particle model of matter, changes of state</p>
Useful websites/videos	<p>Burning iron wool – change in mass: https://www.youtube.com/watch?v=TsnLmgWXw-E</p> <p>Moles calculations: https://www.youtube.com/watch?v=sV6_3Wc5VrE https://www.youtube.com/playlist?list=PLDgS-dbJHqqdZol9KJdi8G0m0cC4D2iB</p>

Wider Reading	Importance of atom economy in industry
Literacy Programme	<ul style="list-style-type: none">• Decode it NOW• Guided practice/model answers• Sentence Starters• Writing strategies
Independent Learning Tasks	Mind-map revision homework Retrieval practice homework Knowledge Organiser practice questions Selective reading activity Seneca quiz ILT