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| **Year 10 Curriculum Map : Chemistry** |
| **Assessment Objectives** | **AO1** - Demonstrate knowledge and understanding of: scientific ideas; scientific techniques and procedures (40%)**AO2** - Apply knowledge and understanding of: scientific ideas; scientific enquiry, techniques and procedures. (40%)**AO3** - Analyse information and ideas to: interpret and evaluate; make judgements and draw conclusions; develop and improve experimental procedures. (20%) |
| **Unit Length** | **Topic:** C1 – Atomic structure and periodic table – 16/17 lessons(Autumn term) |
| **Key Learning Outcomes** | 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. *Progress assessment*
8. *Reteach and DIRT*
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. *Revision*
16. *End of unit assessment*
17. *Reteach and DIRT*
 |
| **Prior knowledge** | **Year 7:*** Simple techniques for separating mixtures
* The identification of pure substances
* Atoms, elements and compounds
* Word and symbol equations

**Year 8:*** 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
* Displacement reactions

 **Year 9:*** Pure substances and formulations
* Metallic bonding and alloys
* Chromatography
 |
| **CEIAG** **Specific careers links** | Research scientistChemical engineeringForensic scientistFormulations chemistToxicologistPharmaceutical chemistMaterials scientist |
| **RRSA** | Article 14: Freedom of thought, belief and religionArticle 24: Health and the Health servicesArticle 28: Right to educationArticle 29: Goals of educationArticle 27: Adequate standard of living |
| **Cross curricular links** | DT – Properties of materialsMaths – Calculating Rf values, comparing boiling points and melting points, calculation isotopic abundance, balancing equationsPhysics – Particle model of matter, development of the atomic model, isotopes  |
| **Useful websites/videos** | Most expensive metals:<https://www.youtube.com/watch?v=VBGYQ51my5c&t=18s>2400 year search for the atom:<https://www.youtube.com/watch?v=xazQRcSCRaY&t=3s>Carbon dating (isotopes):<https://www.youtube.com/watch?v=phZeE7Att_s>Titanium implants (transition metals):<https://www.youtube.com/watch?v=lJiznlz5buc>Colours of the noble gases:<https://www.youtube.com/watch?v=lJiznlz5buc> |
| **Wider Reading** | Uses of alloysGenius of Mendeleev and predicting elementsDanger of chlorine gasDiscovery of neutrons |
| **Literacy Programme** | * Decode it NOW
* Guided practice/model answers
* Sentence Starters
* Writing strategies
 |
| **Independent Learning Tasks** | Mind-map revision homeworkRetrieval practice homework Knowledge Organiser practice questionsSelective reading activitySeneca quiz ILT |

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| **Unit Length** | **Topic:** C2 – Structure and bonding – 12/13 lessons(Autumn/Spring term) |
| **Key Learning Outcomes** | 1. Ionic bonding and compounds
2. Covalent bonding and compounds
3. Comparing ionic and covalent compounds
4. Giant covalent compounds
5. Polymers
6. *Progress assessment*
7. *Reteach and DIRT*
8. Metals and alloys
9. Properties of substances
10. Nanoparticles (TRIPLE ONLY)
11. *Revision*
12. *End of unit assessment*
13. *Reteach and DIRT*
 |
| **Prior knowledge** | **Year 7:*** Atoms, elements and compounds
* Word and symbol equations
* Particle model of matter and changes of state

**Year 8:*** The varying physical and chemical properties of different elements
* The properties of metals and non-metals
* Atomic structure and electronic structure

 **Year 9:*** Properties of substances and states of matter
* Ionic, covalent and metallic bonding
* Properties of ionic, covalent and metallic compounds
 |
| **CEIAG** **Specific careers links** | Research scientistChemical engineeringPolymer chemistFormulations chemistPharmaceutical chemistMaterials scientistNanoscience and nanotechnology |
| **RRSA** | Article 14: Freedom of thought, belief and religionArticle 24: Health and the Health servicesArticle 28: Right to educationArticle 29: Goals of educationArticle 27: Adequate standard of living |
| **Cross curricular links** | DT – Properties of materials, polymersMaths – Comparing boiling points and melting pointsPhysics – Particle model of matter  |
| **Useful websites/videos** | Blood diamonds:<https://www.youtube.com/watch?v=KH0QC94MTos>Lab grown diamonds:<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 diamondsLab grown diamonds vs mined diamondsPolymers in our daily lifeHow plastic changed the worldTungsten – the strongest metal on EarthLead poisoning  |
| **Literacy Programme** | * Decode it NOW
* Guided practice/model answers
* Sentence Starters
* Writing strategies
 |
| **Independent Learning Tasks** | Mind-map revision homeworkRetrieval practice homework Knowledge Organiser practice questionsSelective reading activitySeneca quiz ILT |

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| **Unit Length** | **Topic:** C4 – Chemical changes – 16-19 lessons(Spring/summer term) |
| **Key Learning Outcomes** | 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** | 1. *Progress assessment*
2. *Reteach and DIRT*
3. Electrolysis of molten compounds
4. Electrolysis of aluminium oxide
5. Electrolysis of aqueous solutions
6. Electrolysis (required practical)
7. *Revision*
8. *End of unit assessment*
9. *Reteach and DIRT*
 |
| **Prior knowledge** | **Year 7:*** Atoms, elements and compounds
* Word and symbol equations

**Year 8:*** 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)

**Year 9:*** Properties of substances
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| **CEIAG** **Specific careers links** | Research scientistChemical engineeringMaterials scientistMining industryMetallurgistWelder |
| **RRSA** | Article 14: Freedom of thought, belief and religionArticle 24: Health and the Health servicesArticle 28: Right to educationArticle 29: Goals of educationArticle 27: Adequate standard of living |
| **Cross curricular links** | DT – Properties of materials, extracting metal from the groundMaths – Concentration calculationsPhysics – Particle model of matterGeography – Impact of mining  |
| **Useful websites/videos** | Extraction of iron ore:<https://www.youtube.com/watch?v=fxBIgbRT8fw>Aluminium oxide electrolysis:<https://www.youtube.com/watch?v=mvDHeYI-a00>Soluble salts required practical:<https://www.youtube.com/watch?v=mvDHeYI-a00>Electrolysis required practical:<https://www.youtube.com/watch?v=tCHE_7QeRUc>Titration required practical:<https://www.youtube.com/watch?v=tCHE_7QeRUc>Railroad thermite welding:<https://www.youtube.com/watch?v=tCHE_7QeRUc> |
| **Wider Reading** | Environmental and economic impacts of miningMining iron ore in AustraliaUse of copper sulphate as fertiliserAlternative ways of extracting metals from the ground |
| **Literacy Programme** | * Decode it NOW
* Guided practice/model answers
* Sentence Starters
* Writing strategies
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| **Independent Learning Tasks** | Mind-map revision homeworkRetrieval practice homework Knowledge Organiser practice questionsSelective reading activitySeneca quiz ILT |

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| **Unit Length** | **Topic:** C5 – Energy changes – 6-7 lessons(Spring/summer term) |
| **Key Learning Outcomes** | 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. *Progress assessment (no formal EOU as unit is so small – C5 content will be assessed in mock exam at the end of the year)*
7. *Reteach and DIRT*
 |
| **Prior knowledge** | **Year 8:*** pH and neutralisation

**Year 9:*** Chemical and physical reactions
* Endothermic and exothermic reactions
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| **CEIAG** **Specific careers links** | Research scientistChemical engineeringMaterials scientist |
| **RRSA** | Article 14: Freedom of thought, belief and religionArticle 24: Health and the Health servicesArticle 28: Right to educationArticle 29: Goals of educationArticle 27: Adequate standard of living |
| **Cross curricular links** | Maths – Drawing reaction profilesPhysics – 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** | * Decode it NOW
* Guided practice/model answers
* Sentence Starters
* Writing strategies
 |
| **Independent Learning Tasks** | Mind-map revision homeworkRetrieval practice homework Knowledge Organiser practice questionsSelective reading activitySeneca quiz ILT |

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| **Unit Length** | **Topic:** C3 – Quantitative chemistry – 7-13 lessons(Summer term) |
| **Key Learning Outcomes** | 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)
11. Amounts of substances in volumes of gases (TRIPLE ONLY)
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)*
13. *Reteach and DIRT*
 |
| **Prior knowledge** | **Year 7:*** Conservation of mass

**Year 8:*** Word and symbol equations
* Atomic structure and mass number

**Year 9:*** Chemical and physical reactions
 |
| **CEIAG** **Specific careers links** | Research scientistChemical engineeringMaterials scientistMedicinal chemistry and pharmaceuticals Lean manufacturing |
| **RRSA** | Article 14: Freedom of thought, belief and religionArticle 24: Health and the Health servicesArticle 28: Right to educationArticle 29: Goals of educationArticle 27: Adequate standard of living |
| **Cross curricular links** | Maths – Concentration calculations, moles calculations, use of units, percentage atom economyPhysics – link to conservation of energy, particle model of matter, changes of state |
| **Useful websites/videos** | Burning iron wool – change in mass:<https://www.youtube.com/watch?v=TsnLmgWXw-E>Moles calculations:<https://www.youtube.com/watch?v=sV6_3Wc5VrE><https://www.youtube.com/playlist?list=PLDgS-dbJHqqdZol9KJdi8GOmocC4D2iB_> |
| **Wider Reading** | Importance of atom economy in industry |
| **Literacy Programme** | * Decode it NOW
* Guided practice/model answers
* Sentence Starters
* Writing strategies
 |
| **Independent Learning Tasks** | Mind-map revision homeworkRetrieval practice homework Knowledge Organiser practice questionsSelective reading activitySeneca quiz ILT |