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| **Year 11 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:** C6 – Rate and extent of chemical change – 9/10 lessons  (Autumn term) |
| **Key Learning Outcomes** | 1. Calculating rates of reaction 2. Factors affecting rates of reaction 3. Catalysts 4. Measuring rates of reaction – PRACTICAL 5. Reversible reactions and equilibrium 6. Le Chatelier’s principle (HT/TRIPLE ONLY) 7. *Revision* 8. *End of unit assessment* 9. *Reteach and DIRT* |
| **Prior knowledge** | **Year 7:**   * Chemical and physical reactions * Atoms, elements and compounds * Word and symbol equations * Endothermic and exothermic reactions     **Year 8:**   * Acids, alkalis and the pH scale * Neutralisation * Collision theory * Rates of reaction   **Year 9:**   * Endothermic and exothermic reactions * Factors affecting rates of reaction * Collision theory * Investigating energy changes * Catalysts * Calculating rates of reaction |
| **CEIAG**  **Specific careers links** | Laboratory technician  Kinetics scientist  Analytical chemist  Research scientist  Engineer  Biochemist  Catalysis 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 – Calculating rates, gradients of graphs, rate equations  Physics – Particle model of matter  Biology – enzymes as biological catalysts |
| **Useful websites/videos** | The process that feeds the world:  <https://www.youtube.com/watch?v=o1_D4FscMnU>  Rates of reaction required practical:  <https://www.youtube.com/watch?v=Gl6LVl7oAlU>  How to increase rates of reaction (and get a date):  <https://www.youtube.com/watch?v=OttRV5ykP7A> |
| **Wider Reading** | Rocket launch reactions  Galvanising metals  Use of fertiliser to meet world food demand and rising populations |
| **Literacy Programme** | * 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:** C7 – Organic chemistry – 4/11 lessons  (Autumn term) |
| **Key Learning Outcomes** | 1. Crude oil, hydrocarbons and alkanes 2. Fractional distillation 3. Cracking and alkenes 4. Alkenes (TRIPLE ONLY) 5. Reactions of alkenes (TRIPLE ONLY) 6. Alcohols (TRIPLE ONLY) 7. Carboxylic acids (TRIPLE ONLY) 8. Addition polymerisation (TRIPLE ONLY) 9. Condensation polymerisation (TRIPLE ONLY) 10. Amino acids and DNA (TRIPLE ONLY) 11. *Revision* 12. *End of unit assessment* 13. *Reteach and DIRT* |
| **Prior knowledge** | **Year 7:**   * Separation techniques – distillation * 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 * Combustion and fuels     **Year 9:**   * Properties of substances and states of matter * Polymers and plastics |
| **CEIAG**  **Specific careers links** | Chemical engineer  Polymer chemist  Petrochemicals  Sustainability  Polymer chemist |
| **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** | DT – Properties of materials, polymers, fractional distillation  Maths – Comparing boiling points and melting points  Physics – Particle model of matter, fuels |
| **Useful websites/videos** | Use of nylon in WW2:  <https://www.youtube.com/watch?v=lnUUNjYKm6w&t=16s>  Cracking and alkenes:  <https://www.youtube.com/watch?v=bOiYLKX9ZRY&t=2s>  Fractional distillation:  <https://www.youtube.com/watch?v=5Z26aIG6emk> |
| **Wider Reading** | Importance of plastics in recent technology  Dependency on crude oil vs renewable energy  Effect of burning crude oil on environment |
| **Literacy Programme** | * 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:** C8 – Chemical analysis – 4-7 lessons  (Autumn term) |
| **Key Learning Outcomes** | 1. Pure substances and formulations 2. Chromatography 3. Testing for gases 4. Flame tests (TRIPLE ONLY) 5. Testing for ions (TRIPLE ONLY) 6. Instrumental methods and FES (TRIPLE ONLY)   *Assessed by paper 2 mock* |
| **Prior knowledge** | **Year 8:**   * Atoms, elements and compounds, mixtures   **Year 9:**   * Chromatography * Testing for gases * Metal and non-metals ions |
| **CEIAG**  **Specific careers links** | Materials engineer  Forensic scientist  Food additive analyst  Water sample analyst  Gas engineer |
| **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** | DT – Alloys as useful materials  Maths – calculating Rf values |
| **Useful websites/videos** | Chromatography required practical:  <https://www.youtube.com/watch?v=pnTGNAfu6GE&t=456s>  Forensic science use of chromatography:  <https://www.youtube.com/watch?v=kCKM_ICjDtc>  Hindenburg disaster:  <https://www.youtube.com/watch?v=CgWHbpMVQ1U&t=29s>  Carbon-fibre as a formulation:  <https://www.youtube.com/watch?v=4z6VaQ0BSB0>  Testing for ions required practical:  <https://www.youtube.com/watch?v=fCZztwJmAl0&t=474s> |
| **Wider Reading** | Case of Holly Wells and Jessica Chapman and the use of chromatography in catching their killer  Use of different metal ions in fireworks  Titanium alloys in aerospace |
| **Literacy Programme** | * 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:** C9 – Chemistry of the atmosphere – 10 lessons  (Autumn/spring term) |
| **Key Learning Outcomes** | 1. Proportions of gases in the atmosphere 2. The Earth’s early atmosphere 3. Evolution of the atmosphere 4. Greenhouse gases 5. Combustion 6. Human activities 7. Global climate change 8. Carbon footprint 9. Atmospheric pollutants from fuels   *Assessed by paper 2 mock* |
| **Prior knowledge** | **Year 8:**   * Writing word equations for chemical reactions * Combustion * Carbon cycle * Earth’s atmosphere * Climate change   **Year 9:**   * Sustainable development * Resources and waste |
| **CEIAG**  **Specific careers links** | Environmentalist  Conservationist  Sustainability  Air pollution analyst  Water pollution analyst  Renewable energy  Environmental lawyer |
| **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** | Geography – sustainability, climate change, changes in the Earth’s atmosphere  Physics – renewable energy  Biology – biodiversity  Technology – sustainable materials |
| **Useful websites/videos** | Interesting explanation of the carbon cycle:  <https://www.youtube.com/watch?v=A4cPmHGegKI>  History of the atmosphere:  <https://www.youtube.com/watch?v=gwGeH9O8Rx4>  What would happen if earth’s atmosphere disappeared?  <https://www.youtube.com/watch?v=Ehzzm4rjJj8>  Powerful message about impact of humans on the environment:  <https://www.youtube.com/watch?v=B-nEYsyRlYo>  Carbon footprint:  <https://www.youtube.com/watch?v=a9yO-K8mwL0&t=11s>  Dynasties crew rescue group of penguins:  <https://www.youtube.com/watch?v=2Co_hmLenD8>  Paris agreement:  <https://www.youtube.com/watch?v=I-4F5MJEeqs> |
| **Wider Reading** | Paris agreement  COP26  Deforestation of Brazilian rainforests  Loss of species  ‘Greenwashing’ by large companies |
| **Literacy Programme** | * 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:** C10 – Using resources – 7 lessons  (Spring term) |
| **Key Learning Outcomes** | 1. Earth’s resources and sustainable development 2. Potable water 3. Waste water treatment 4. Extracting metals (HT ONLY) 5. Life cycle assessments 6. Reducing the use of resources   *Assessed by paper 2 mock* |
| **Prior knowledge** | **Year 9:**   * Sustainable development * Resources and waste * Recycling   **Year 10:**   * Separation techniques – distillation, filtration * Extraction of metals |
| **CEIAG**  **Specific careers links** | Environmentalist  Conservationist  Sustainability  Water engineer  Water pollution analyst |
| **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** | Geography – sustainability, use of resources  Physics – renewable energy  Biology – biodiversity, feeding a growing population  Technology – life cycle assessments |
| **Useful websites/videos** | Water purification required practical:  <https://www.youtube.com/watch?v=_UGHsbTEBvA>  Access to clean water in Rwanda:  <https://www.youtube.com/watch?v=isJNqosfX6w>  Impact of looming copper shortage:  <https://www.youtube.com/watch?v=6LBC8ntzgIA> |
| **Wider Reading** | Recycling in your area  How to reduce your carbon footprint at home and at school  Access to clean water in third world countries  Impact of copper shortage on prices of metals |
| **Literacy Programme** | * 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 |