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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 technicianKinetics scientist Analytical chemistResearch scientistEngineerBiochemistCatalysis 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 – Calculating rates, gradients of graphs, rate equationsPhysics – Particle model of matterBiology – 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 reactionsGalvanising metalsUse 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 homeworkRetrieval practice homework Knowledge Organiser practice questionsSelective reading activitySeneca 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 engineerPolymer chemistPetrochemicalsSustainabilityPolymer chemist |
| **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, polymers, fractional distillationMaths – Comparing boiling points and melting pointsPhysics – 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 technologyDependency on crude oil vs renewable energyEffect of burning crude oil on environment  |
| **Literacy Programme** | * Decode it NOW
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* 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:** 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 engineerForensic scientistFood additive analystWater sample analystGas engineer |
| **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 – Alloys as useful materialsMaths – 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 killerUse of different metal ions in fireworksTitanium alloys in aerospace |
| **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:** 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** | EnvironmentalistConservationistSustainabilityAir pollution analystWater pollution analystRenewable energyEnvironmental lawyer |
| **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** | Geography – sustainability, climate change, changes in the Earth’s atmospherePhysics – renewable energyBiology – biodiversityTechnology – 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 agreementCOP26Deforestation of Brazilian rainforestsLoss 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 homeworkRetrieval practice homework Knowledge Organiser practice questionsSelective reading activitySeneca 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** | EnvironmentalistConservationistSustainabilityWater engineerWater pollution analyst |
| **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** | Geography – sustainability, use of resourcesPhysics – renewable energyBiology – biodiversity, feeding a growing populationTechnology – 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 areaHow to reduce your carbon footprint at home and at schoolAccess to clean water in third world countriesImpact 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 homeworkRetrieval practice homework Knowledge Organiser practice questionsSelective reading activitySeneca quiz ILT |