

Science Overview - Chemistry

Year 9

| | Term 1 | Term 2 | Term 3 |
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| Topic | <ul style="list-style-type: none"> · Atomic structure · Water · Separations · Bonding · The periodic table | <ul style="list-style-type: none"> · The pH scale · Further reactions of acids | <ul style="list-style-type: none"> · Solving problems with chemistry |
| Key concept | Materials and their properties | Chemical changes | Our Earth and it's atmosphere |
| Learning Objectives | <ul style="list-style-type: none"> · Describe the structure of an atom. · Explain what makes up the relative mass of a nucleus. · Calculate the number of sub-atomic particles in an atom. · Show the electronic configuration for the first twenty elements. · State the meaning of the term isotope. · Use melting point data to test purity. · State why water used in analysis must be pure. · Describe how sedimentation, filtration and chlorination are used to make potable water. · Describe how crystals can be produced from a solution. · Explain how distillation can be used to separate mixtures. · Describe how chromatography separates mixtures. · Interpret a chromatogram, including using R_f values. | <ul style="list-style-type: none"> · State the ions released when acids and alkalis are dissolved. · Describe the colour of litmus, methyl orange and phenolphthalein in acidic and alkaline solutions. · State the pH values of acids and alkalis. · State that a base is a substance that reacts with an acid to make a salt and water. · State that neutralisation is when H⁺ ions react with OH⁻ ions to make water. · Describe that reactants turn into products. · State the format of a word equation: reactants → products. | <ul style="list-style-type: none"> · Describe the composition of dry air. · State the tests for oxygen and carbon dioxide. · Describe how to find the percentage of oxygen in the air. · State the meaning of 'greenhouse gas' and that carbon dioxide, water and methane are greenhouse gases. · Describe how human activity increases the concentration of greenhouses gases. · Describe the possible effects on the climate of increased levels of carbon dioxide and methane. · Describe how the potential harmful effects of climate change can be addressed and limited. |

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| | · Explain the difference between covalent and ionic bonding. | | |
| Scaffolding SEND | glossaries, targeted questions, knowledge organisers, recall quizzes | glossaries, targeted questions, knowledge organisers, recall quizzes | glossaries, targeted questions, knowledge organisers, recall quizzes |
| Key Vocabulary | orbit, electron, atomic number, electronic configuration, isotopes, mass number, neutron, proton, relative atomic mass, shell, chlorination, filtrate, filtration, ground water, particle model, sedimentation, solute, solvent, condense, crystallisation, distillation, evaporate, evaporation, physical change, chromatography, fractional distillation, mobile phase, solute, solvent, solvent front, stationary phase, anion, ball and stick, Buckminsterfullerene, cation, delocalised electrons, dot and cross, fullerene, giant lattice, graphene, ion, sea of electrons | acid, alkali, neutral, strength, concentration, indicator, base, ion, ionic equation, methyl orange, neutralisation, pH, phenolphthalein | climate change, Earth's atmosphere, fossil fuels, glass, global warming, greenhouse effect, ceramic, finite, ore, raw material, composite, polymer. |
| Formative Assessment | Rewind grids | Rewind grids | Rewind grids |
| Summative Assessment | End of unit test | End of unit test | End of unit test |
| Careers | forensic scientist, lab technician, quantum physicist | botanist, conservationist, dietician, equine dentist, forensic scientist, geoscientist, hydrotherapist, immunologist, lab technician, marine biologist, neuroscientist, paramedic, optician, urologist, volcanologist | botanist, conservationist, lab technician, marine biologist, weather forecaster |
| Links | To build on atoms having symbols. In addition, solutions and mixture. | To build on household acids and alkalis. In addition, the use of simple indicators. To prepare for salt preparation methods. | To build on household acids and alkalis. In addition, the use of simple indicators. To prepare for salt preparation methods. |

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| | Preparing for bonding and the reactivity series. In addition, separation techniques. | | |
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