

## KS4 Science Curriculum Plan 2014-15

### AQA A GCSE Specification - 9 lessons per fortnight

[www.aqa.org.uk](http://www.aqa.org.uk)

#### Full details of the units:

| Topic                        | Content summary   |
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| <b>Year 9</b>                |   |
| Energy transfer by heating   | <ul style="list-style-type: none"><li>• Infrared radiation</li><li>• Surfaces and radiation</li><li>• Heat transfer</li><li>• Evaporation and condensation</li><li>• Specific heat capacity</li><li>• Heating and insulating buildings</li></ul>    |
| Using Energy                 | <ul style="list-style-type: none"><li>• Forms of energy</li><li>• Conservation of mass</li><li>• Useful energy</li><li>• Energy and efficiency</li></ul>  |
| Electrical energy            | <ul style="list-style-type: none"><li>• Electrical appliances</li><li>• Electrical power</li><li>• Using electrical energy</li><li>• Cost effectiveness matters</li></ul>   |
| Generating electricity       | <ul style="list-style-type: none"><li>• Fuel for electricity</li><li>• Energy from wind and water</li><li>• Power from the sun and the earth</li><li>• Energy and the environment</li><li>• The national grid</li><li>• Big energy issues</li></ul> |
| Waves                        | <ul style="list-style-type: none"><li>• The nature of waves</li><li>• Measuring waves</li><li>• Waves properties including reflection, refraction and diffraction</li><li>• Sound and musical sounds</li></ul>                                      |
| Electromagnetic Waves        | <ul style="list-style-type: none"><li>• The electromagnetic spectrum</li><li>• Light, infrared, microwaves and radio waves</li><li>• Communication using electromagnetic waves</li><li>• The expanding universe and the Big Bang theory</li></ul>   |
| <b>Year 10</b>               |   |
| <b>Chemistry C1</b>          |   |
| Fundamental ideas            | <ul style="list-style-type: none"><li>• Atoms, elements and compounds</li><li>• Atomic structure</li><li>• The arrangement of electrons in atoms</li><li>• Forming bonds</li><li>• Chemical equations</li></ul>                                     |
| Rocks and building materials | <ul style="list-style-type: none"><li>• Limestone and its uses</li><li>• Reactions in carbonates</li><li>• The limestone reaction cycle</li><li>• Cement and concrete</li><li>• Limestone issues</li></ul>  |
| Metals and their uses        | <ul style="list-style-type: none"><li>• Extracting metals</li></ul>   |

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|   | <ul style="list-style-type: none"> <li>• Iron and steel</li> <li>• Aluminium and titanium</li> <li>• Extracting copper</li> <li>• Useful metals and issues</li> </ul>   |
| Crude oil and fuels                     | <ul style="list-style-type: none"> <li>• Fuels and crude oil</li> <li>• Fractional distillation</li> <li>• Burning fuels</li> <li>• Cleaner fuels and alternative fuels</li> </ul>  |
| Products from oil                       | <ul style="list-style-type: none"> <li>• Cracking hydrocarbons</li> <li>• Making polymers from alkenes</li> <li>• New and useful polymers</li> <li>• Plastic waste and uses of ethanol</li> </ul>   |
| Plant oils                              | <ul style="list-style-type: none"> <li>• Extracting vegetable oils</li> <li>• Cooking with vegetable oils</li> <li>• Everyday emulsions and food issues</li> </ul>  |
| <b>Our changing planet</b>              | <ul style="list-style-type: none"> <li>• Structure of the earth</li> <li>• The earth's atmosphere in the past</li> <li>• Life on earth</li> <li>• Gases in the atmosphere</li> <li>• Carbon dioxide in the atmosphere</li> </ul>              |
| <b>Biology B1</b>                       |   |
| Keeping Healthy                         | <ul style="list-style-type: none"> <li>• Diet and exercise</li> <li>• How our bodies defend themselves against infectious diseases</li> </ul>   |
| Nerves and hormones                     | <ul style="list-style-type: none"> <li>• The nervous system</li> <li>• Control in the human body</li> <li>• Control in plants</li> </ul>  |
| The use and abuse of drugs              | <ul style="list-style-type: none"> <li>• Types of drugs</li> <li>• Testing of new drugs and clinical trials</li> <li>• Steroids and performance enhancing drugs</li> </ul>  |
| Interdependence and adaptation          | <ul style="list-style-type: none"> <li>• Adaptations</li> <li>• Environmental change</li> </ul>   |
| Energy and biomass in food chains       | <ul style="list-style-type: none"> <li>• Energy in biomass</li> <li>• Pyramids of biomass</li> </ul>  |
| Waste materials from plants and animals | <ul style="list-style-type: none"> <li>• Decay processes</li> <li>• The carbon cycle</li> </ul>   |
| Genetic variation and control           | <ul style="list-style-type: none"> <li>• Why organisms are different</li> <li>• Reproduction</li> <li>• Evolution</li> </ul>  |
| <b>Year 11</b>                          |   |
| <b>Chemistry C2</b>                     |   |
| Structure and Bonding                   | <ul style="list-style-type: none"> <li>• Chemical bonding</li> <li>• Ionic bonding</li> <li>• Formulae of ionic compounds</li> <li>• Covalent bonding</li> <li>• Metals</li> </ul>  |
| Structure and properties                | <ul style="list-style-type: none"> <li>• Giant ionic structures</li> <li>• Simple molecules</li> <li>• Giant covalent structures</li> <li>• Giant metallic structures</li> <li>• The properties of polymers</li> <li>• Nanoscience</li> </ul> |

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| Quantitative Chemistry            | <ul style="list-style-type: none"> <li>• The masses of atoms and calculating moles</li> <li>• Percentage and formulae</li> <li>• Equations and calculations</li> <li>• Yield of a chemical reaction</li> <li>• Reversible reactions</li> <li>• Analysing substances</li> </ul> |
| Rates of reaction                 | <ul style="list-style-type: none"> <li>• Collision theory and surface area</li> <li>• The effect of temperature and concentration</li> <li>• Catalysts in action</li> <li>• Measuring the rate of a reaction</li> <li>• Energy changes in reaction</li> </ul>                  |
| Salts and electrolysis            | <ul style="list-style-type: none"> <li>• Acids and bases</li> <li>• Making salts</li> <li>• Electrolysis</li> <li>• The extraction of aluminium and brine</li> <li>• Electroplating</li> </ul>   |
| <b>Physics P2</b>                 |  |
| Motion                            | <ul style="list-style-type: none"> <li>• Distance- time graphs</li> <li>• Velocity and acceleration</li> <li>• Velocity-time graphs</li> <li>• Using graphs to interpret data</li> </ul>   |
| Forces                            | <ul style="list-style-type: none"> <li>• Forces between objects</li> <li>• Force and acceleration</li> <li>• Falling objects</li> </ul>  |
| Work, energy and momentum         | <ul style="list-style-type: none"> <li>• Energy and work</li> <li>• Gravitational potential energy</li> <li>• Kinetic energy</li> <li>• Momentum</li> <li>• Car safety</li> </ul>  |
| Current electricity               | <ul style="list-style-type: none"> <li>• Electric circuits</li> <li>• Resistance</li> <li>• Series and parallel circuits</li> </ul>  |
| Mains electricity                 | <ul style="list-style-type: none"> <li>• Alternating current</li> <li>• Cables and plugs</li> <li>• Electrical power and potential difference</li> <li>• Electrical charge</li> </ul>  |
| Radioactivity                     | <ul style="list-style-type: none"> <li>• Discovery of the nucleus</li> <li>• Nuclear reactions</li> <li>• Alpha/Beta and gamma radiation</li> <li>• Half life</li> </ul>   |
| Energy from the nucleus           | <ul style="list-style-type: none"> <li>• Nuclear Fission and fusion</li> <li>• The early universe</li> <li>• Life history of a star</li> <li>• How the chemical elements formed</li> </ul>   |
| <b>Biology B2</b>                 |  |
| Cells and cell transport          | <ul style="list-style-type: none"> <li>• Cells and cell structure</li> <li>• Dissolved substances - diffusion</li> </ul>   |
| Tissues, organs and organ systems | <ul style="list-style-type: none"> <li>• Animal organs</li> <li>• Plant organs</li> </ul>  |
| Photosynthesis                    | <ul style="list-style-type: none"> <li>• What happens during photosynthesis</li> <li>• Factors affecting photosynthesis</li> </ul>   |

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| <b>Organisms and their environment</b> | <ul style="list-style-type: none"><li>• <b>Distribution of organisms</b></li><li>• <b>Using different sampling techniques such as quadrats</b></li></ul>              |
| <b>Proteins and their functions</b>    | <ul style="list-style-type: none"><li>• <b>Examples of protein molecules such as hormones</b></li><li>• <b>Enzyme function in industry and in the home</b></li></ul>  |
| <b>Respiration</b>                     | <ul style="list-style-type: none"><li>• <b>Aerobic respiration</b></li><li>• <b>Anaerobic respiration</b></li></ul>   |
| <b>Cell division</b>                   | <ul style="list-style-type: none"><li>• <b>Types of cell division</b></li><li>• <b>Genetic variation and chromosomes</b></li><li>• <b>Genetic disorders</b></li></ul> |