

**Year 10-11 Combined Science Curriculum Map  
and  
Skills Descriptors  
Science**

Practical Skills

Mathematical application

Literacy

Apparatus

Scientific Techniques

Science Capital

| Year/Term              | Unit of Work                      | CORE KNOWLEDGE   | Link to KS3 | KEY SKILLS  |
|------------------------|-----------------------------------|--|-------------|---|
| 10 Autumn<br>Biology   | Biology recap - Cell Organisation | · Lungs and gas exchange · Heart · Cardiovascular disease · Cancer · Plant organs  |             | Practical Skills<br>Mathematical application<br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |
| 10 Autumn<br>Biology   | Infection and response            | ● Communicable diseases ● Viral/bacteria/fungi/protist disease ● Preventing disease and non-specific defence (skin, nose, trachea, stomach) ● White blood cells and immune response ● Vaccinations ● Antibiotics and painkillers ● Drug developmen |             | Practical Skills<br>Mathematical application<br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |
| 10 Autumn<br>Biology   | Bioenergetics                     | ● Photosynthesis ● Rate of photosynthesis and limiting factors (HT inverse square law of light) RP 5 ● Uses of glucose   |             | Practical Skills<br>Mathematical application<br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |
| 10 Autumn<br>Chemistry | Chemistry recap                   | · Atomic structure · Periodic table · Bonding  |             | Practical Skills<br>Mathematical application<br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |
| 10 Autumn<br>Chemistry | 4.3 Quantitative chemistry        | · Conservation of mass and balanced equations · Relative formula mass · Changes in mass and uncertainty · HT Moles, reacting masses, using moles to balance equations, limiting reactants · Concentrations of solutions                            |             | Practical Skills<br>Mathematical application<br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |
| 10 Autumn<br>Physics   | 6.2 Electricity                   | · Current and circuit symbols. · Charge and current ( $Q=It$ ) · Current, resistance and potential difference ( $V=IR$ ) (RP 15) ·   |             | Practical Skills<br>Mathematical application  |

|                      |                              |   |  |   |
|----------------------|------------------------------|---|--|---|
|                      |                              | Resistors (RP16) · Series circuits · Parallel circuits · Domestic electricity   |  | Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital   |
| <b>ASSESSMENT 1:</b> |                              |   |  |   |
| 10 Autumn Physics    | 6.2 Electricity              | · Power ( $P=VI$ , $P=I^2R$ ) · Energy transfers ( $E=Pt$ , $E=QV$ ) · National grid  |  | Practical Skills<br>Mathematical application<br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |
| 10 Autumn Biology    | 4.4 Bioenergetics            | ● Respiration- Aerobic and anaerobic ● Response to exercise ● Metabolism  |  | Practical Skills<br>Mathematical application<br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |
| 10 Autumn Chemistry  | 5.4 Chemical changes         | · Metal oxides · Reactivity series · Extraction of metals/reduction (HT REDOX and ionic equations) · Acids and bases and the pH scale · Strong and weak acids · Reactions of acids · Neutralisation · Making soluble salts (RP 8) |  | Practical Skills<br>Mathematical application<br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |
| 10 Autumn Physics    | 6.3 Particle model of matter | · Density ( $\rho=m/V$ ) (RP 17) · States of matter and changes of state · Internal energy · Specific heat capacity · Specific latent heat · Particle motion in gases   |  | Practical Skills<br>Mathematical application<br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |
| 10 Autumn Physics    | 6.4 Atomic structure         | ● Atomic structure, mass number and atomic number. ● Isotopes ● Development of the atom (plum pudding etc)  |  | Practical Skills<br>Mathematical application<br>Literacy<br>Apparatus   |

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|                           |                              |  |  | Scientific Techniques<br>Science Capital  |
| <b>ASSESSMENT 2:</b>      |                              |  |  |   |
| 10 Spring Chemistry       | 5.4 Chemical changes         | · Electrolysis · Electrolysis and extracting metals · Electrolysis and aqueous solutions (RP 9) (HT half equations)  |  | Practical Skills<br>Mathematical application<br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |
| 10 Spring Physics         | 6.3 Particle model of matter | ● Radiation and types of decay ● Nuclear equations ● Half-life and random decay ● Radioactive contamination  |  | Practical Skills<br>Mathematical application<br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |
| 10 Spring Chemistry       | 5.5 Energy changes           | · Energy changes and examples (RP10) · Reaction profiles (HT Energy change of reactions)   |  | Practical Skills<br>Mathematical application<br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |
| 10 Spring Exam techniques | Exam techniques              | Exam question practice Skills focus: 6 marker questions<br>Data questions Calculation/equation questions<br>Walking/talking mocks Required practical time (any missed in paper 1 from previous year)   |  | Practical Skills<br>Mathematical application<br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |
| <b>ASSESSMET 3:</b>       |                              |  |  |   |
| 10 Spring Physics         | 6.5 Forces                   | · Scalar and vectors · Contact and non-contact forces · Weight/mass/gravity Resultant forces and work done · Calculating forces · Elasticity · Investigating springs (RP 18) · Distance and displacement · Acceleration · Investigating acceleration (RP19) · Distance/time and vel/time |  | Practical Skills<br>Mathematical application<br>Literacy<br>Apparatus<br>Scientific Techniques                    |

|                           |   |   |  |   |
|---------------------------|---|---|--|---|
|                           |   |   |  | Science Capital   |
| 10 Spring Chemistry       | 5.6 Rate and extent of change (rate of reactions) | 5.6 Rate and extent of change (rate of reactions) · Rate of reactions · Factors affecting rate of reactions · Concentration and rate of reaction (RP11) · Measuring rate of reactions · Activation energy and catalysts · Reversible reactions · Le Chatelier's Principle · Factors affecting equilibrium |  | Practical Skills<br>Mathematical application<br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |
| <b>ASSESSMENT 4:</b>      |   |   |  |   |
| 10 Summer Physics         | 6.5 Forces  | · Terminal Velocity · Newton's first and second laws · Inertia · Newton's third law and breaking distance · Momentum (HT)   |  | Practical Skills<br>Mathematical application<br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |
| 10 Summer Physics         | 5.7 Organic Chemistry                             | · Hydrocarbons · Fractional distillation · Crude oil · Uses and cracking of crude oil   |  | Practical Skills<br>Mathematical application<br>Apparatus<br>Scientific Techniques<br>Science Capital             |
| 10 Summer Chemistry       | 5.8 Chemical analysis                             | · Purity and formulations · Paper chromatography · Chromatography experiment (RP12) · Test for gases  |  | Practical Skills<br>Mathematical application<br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |
| 10 Assessment preparation | Assessment preparation                            | Revision Exam practice Skills focus   |  | Practical Skills<br>Mathematical application<br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |

**ASSESSMENT 5:**

|                        |                                    |  |  |   |
|------------------------|------------------------------------|--|--|---|
| 10 Summer<br>Biology   | 4.5 Homeostasis<br>and response    | · Homeostasis · Nervous system · Reaction time (RP6) ·<br>Endocrine system · Blood glucose · Hormones in human<br>reproduction · Contraception · HT Fertility · HT Adrenaline<br>and Thyroxine                                 |  | <b>Practical Skills</b><br><b>Mathematical application</b><br><b>Literacy</b><br><b>Apparatus</b><br><b>Scientific Techniques</b><br><b>Science Capital</b> |
| 10 Summer<br>Physics   | 6.6 Waves                          | · Wave and wave properties · RP20 Ripple tank ·<br>Electromagnetic waves · Ray diagrams and wave front<br>diagrams on refraction (HT) · RP 21 Infrared absorption<br>· Properties and uses of EM waves                         |  | <b>Practical Skills</b><br><b>Mathematical application</b><br><b>Literacy</b><br><b>Apparatus</b><br><b>Scientific Techniques</b><br><b>Science Capital</b> |
| 10 Summer<br>Chemistry | 5.9 Chemistry of<br>the atmosphere | · Composition of current atmosphere · Earth's early<br>atmosphere · How O <sub>2</sub> and CO <sub>2</sub> increased · Greenhouse<br>gases and human activity · Climate change and carbon<br>footprint · Atmospheric pollutant |  | <b>Practical Skills</b><br><b>Mathematical application</b><br><b>Literacy</b><br><b>Apparatus</b><br><b>Scientific Techniques</b><br><b>Science Capital</b> |

**ASSESSMENT 6**  
**END OF YEAR ASSESSMENT:**

| Year/Term              | Unit of Work                    | CORE KNOWLEDGE   | Link to KS2 | KEY SKILLS  |
|------------------------|---------------------------------|--|-------------|---|
| 11 Autumn<br>Biology   | 4.6 Inheritance                 | · Sexual and asexual reproduction · Meiosis · DNA and genome · Genetic inheritance and punnet squares incl. sex determination · Polydactyly and cystic fibrosis and embryonic screening · Variation · Selective breeding · Genetic engineering · Evolution and natural selection and evidence · Fossils and extinction · Resistant bacteria · Classification |             | <b>Practical Skills</b><br><b>Mathematical application</b><br><b>Literacy</b><br><b>Apparatus</b><br><b>Scientific Techniques</b><br><b>Science Capital</b> |
| 11 Autumn<br>Physics   | 6.5 Forces                      | (finishing off from last year if incomplete) · Distance and displacement · Acceleration Investigating acceleration (RP19) · Distance/time and vel/time · Terminal Velocity · Newton's first and second laws · Inertia · Newton's third law and breaking distance · Momentum (HT  |             | <b>Practical Skills</b><br><b>Mathematical application</b><br><b>Literacy</b><br><b>Apparatus</b><br><b>Scientific Techniques</b><br><b>Science Capital</b> |
| 11 Autumn<br>Chemistry | 5.9 Chemistry of the atmosphere | · Composition of current atmosphere · Earth's early atmosphere · How O <sub>2</sub> and CO <sub>2</sub> increased · Greenhouse gases and human activity · Climate change and carbon footprint · Atmospheric pollutants   |             | <b>Practical Skills</b><br><b>Mathematical application</b><br><b>Literacy</b><br><b>Apparatus</b><br><b>Scientific Techniques</b><br><b>Science Capital</b> |
| 11 Autumn<br>Physics   | 6.6 Waves                       | · Wave and wave properties · RP20 Ripple tank · Electromagnetic waves · Ray diagrams and wave front diagrams on refraction (HT) · RP 21 Infrared absorption · Properties and uses of EM waves  |             | <b>Practical Skills</b><br><b>Mathematical application</b><br><b>Literacy</b><br><b>Apparatus</b><br><b>Scientific Techniques</b><br><b>Science Capital</b> |

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|----------------------------|------------------------------------|--|--|---|
| 11 Autumn Chemistry        | 5.10 Using resources               | · Earth's resources · Potable water · RP13 Purification of water · Waste water treatment · Phytomining and bioleaching (HT) · Life cycle assessments |  | <b>Practical Skills</b><br><b>Mathematical application</b><br><b>Literacy</b><br><b>Apparatus</b><br><b>Scientific Techniques</b><br><b>Science Capital</b> |
| 11 Autumn Physics          | 6.7 Magnetism and electromagnetism | · Permanent magnets · Magnetic fields · The motor effect and electromagnetism (Fleming's left hand rule HT only) · Electric motors (HT)              |  | <b>Practical Skills</b><br><b>Mathematical application</b><br><b>Literacy</b><br><b>Apparatus</b><br><b>Scientific Techniques</b><br><b>Science Capital</b> |
| 11 Autumn Biology          | 4.7 Ecology                        | · Communities · Abiotic and biotic factors · Adaptations · Levels of organisation · RP 7 Sampling  |  | <b>Practical Skills</b><br><b>Mathematical application</b><br><b>Literacy</b><br><b>Apparatus</b><br><b>Scientific Techniques</b><br><b>Science Capital</b> |
| <b>ASSESSMENT 1:</b>       |                                    |  |  |   |
| 11 Autumn Biology          | 4.7 Ecology                        | · Carbon cycle · Water cycle · Biodiversity · Waste management and land use · Deforestation and global warming · Maintaining biodiversity            |  | <b>Practical Skills</b><br><b>Mathematical application</b><br><b>Literacy</b><br><b>Apparatus</b><br><b>Scientific Techniques</b><br><b>Science Capital</b> |
| 11 Autumn Mock preparation | Mock preparation                   | Mock revision Walking/talking mocks  |  | <b>Practical Skills</b><br><b>Mathematical application</b><br><b>Literacy</b><br><b>Apparatus</b><br><b>Scientific Techniques</b><br><b>Science Capital</b> |



|                      |                             |  |  |   |
|----------------------|-----------------------------|--|--|---|
|                      |                             | Finish off any paper 2 topics<br>Required practical activity catch up/revision     |  | <b>Practical Skills</b><br><b>Mathematical application</b><br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |
| <b>ASSESSMENT 2:</b> |                             |  |  |   |
| 11 Spring term       | Paper 1 revision            | Revision paper 1 Biology<br>Revision paper 1 Chemistry<br>Revision paper 1 Physics |  | <b>Practical Skills</b><br><b>Mathematical application</b><br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |
| <b>ASSESSMENT 3:</b> |                             |  |  |   |
| 11 Spring term       | Required practical revision | Required practical focused revision<br>Walking/talking mocks                       |  | <b>Practical Skills</b><br><b>Mathematical application</b><br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |
| <b>ASSESSMENT 4:</b> |                             |  |  |   |
| 11 Summer Biology    | Feedback                    | Feedback   |  | <b>Practical Skills</b><br><b>Mathematical application</b><br>Literacy<br>Apparatus<br>Scientific Techniques<br>Science Capital |

ASSESSMENT 5: