# Science Curriculum 2020/21

| | Autumn 2020 | Spring 2021 | Summer 2021 |
|---|---|---|---|
| **Y7** | **Passport to Science**<br><br>**Skills**<br>*Reading scales*<br>*Identifying hazards and minimising risks*<br>*Identifying independent and dependent variables*<br>*Presenting data in tables and graphs* | **Ecosystems**<br><br>**Skills**<br>*Bar graphs, histograms, scatter graphs, Normal distribution*<br>*Paragraph structures, topic sentences* | **Reproduction**<br><br>**Skills**<br>*Size of cells and embryo*<br>*Gestation periods – recognising relationships*<br>*Extended writing opportunities* |
| | **Cells & Reproduction**<br><br>**Skills**<br>*Using a microscope*<br>*Biological drawing*<br>*Conventions in writing (organised headings/lists)*<br>*Magnification and scales* | **Energy**<br><br>**Skills**<br>*Interpreting graphs*<br>*Spotting trends in data*<br>*Problem solving of force diagrams*<br>*Researching a topic* | **Current Electricity**<br>**Skills**<br>*Using table to display data*<br>*Relationships from graphs*<br>*Building circuits*<br>*Investigating circuits*<br>*Recording data* |
| | **Particle Model**<br><br>**Skills**<br>*Making a hypothesis*<br>*Converting units*<br>*Calculating volumes* | **Mixtures and Separations**<br><br>**Skills**<br>*Flow charts*<br>*Conventions and symbols*<br>*presenting and interpreting data (tables and graphs)* | **Atoms. Elements and Compounds**<br><br>**Skills**<br>*Tables, graphs, pie charts*<br>*Observations from practical*<br>*Using apparatus (delivery tube)* |
| | **Forces**<br><br>**Skills**<br>*Conventions for communication*<br>*Taking notes*<br>*SI system* | | |
| **Online Provision** | A portion of homework is set on teams in the form of low stakes quizzing. All our lessons are uploaded onto Teams for students to access should they need to. In the event of class isolation, science also uses Educake, ActiveLearn and Quizlet as a remote learning tool. | | |

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| **Y8** | **Mixtures and Separations**<br><br>**Skills**<br>*Reading scales*<br>*Identifying hazards and minimising risks*<br>*Identifying independent and dependent variables*<br>*Presenting data in tables and graphs* | **Acids & Bases**<br><br>**Skills**<br>*Writing equations*<br>*Making and recording observation*<br>*Creating your own indicator*<br>*Improving awareness of health and safety* | **Combustion**<br><br>**Skills**<br>*Planning a fair test (control variables)*<br>*Writing equations*<br>*Interpreting and explaining data* |
| | **Reproduction**<br><br>**Skills**<br>*Size of cells and embryo*<br>*Gestation periods – recognising relationships*<br>*Extended writing opportunities* | **Muscle & Bones**<br>**Skills**<br>*Calculate breathing and heart rate*<br>*Plan an investigation for a scientific question*<br>*Writing up an investigation* | **Fluids**<br>**Skills**<br>*Calculating and measuring volume, calculating density, rearranging equations*<br>*Drawing and interpreting cooling curve graphs* |
| | **Current Electricity**<br>**Skills**<br>*Using table to display data*<br>*Relationships from graphs*<br>*Building circuits*<br>*Investigating circuits*<br>*Recording data* | **Sound**<br>**Skills**<br>*Investigating pitch*<br>*Drawing sound waves*<br>*Drawing bar graphs*<br>*Identifying different graphs of sound* | **Energy Transfers**<br>**Skills**<br>*Accuracy and precision* |
| | **Atoms. Elements and Compounds**<br><br>**Skills**<br>*Tables, graphs, pie charts*<br>*Observations from practical*<br>*Using apparatus (delivery tube)* | **Food & Nutrition**<br>**Skills**<br>*Calculating SA:V*<br>*Qualitative analysis (food tests)*<br>*Facts/opinion/bias*<br>*Models (Visking tubing)* | **Plants and Reproduction**<br><br>**Skills**<br>*Testing leaves for starch*<br>*Classifying plants*<br>*Sampling and accuracy* |
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| **Y9** | **Energy Transfers**<br>**Skills**<br>*Accuracy and precision* | **Plants and Reproduction**<br>**Skills**<br>*Testing leaves for starch*<br>*Classifying plants*<br>*Sampling and accuracy* | **Unicellular Organisms**<br>**Skills**<br>*Organising organism based on their characteristics*<br>*Analysing and explaining graphs*<br>*Recalling word equations* |
| | **Earth and Space**<br>**Skills**<br>*Interpreting data*<br>*Rearranging and solving equations*<br>*Producing information in a timeline*<br>*Investigating magnetic fields using a compass* | **Light**<br>**Skills**<br>*Drawing light rays & measuring angles*<br>*Investigating reflection*<br>*Investigating refraction*<br>*Labelling diagrams* | **Rocks**<br>**Skills**<br>*Relating structure to properties of a substance*<br>*Analysing and annotating diagrams*<br><br>**Reactivity**<br>**Skills**<br>*Identifying physical and chemical changes*<br>*Relating observations to reactant*<br>*Calculating percentage changes* |
| | **Periodic Table**<br>**Skills**<br>*Identifying trends*<br>*Explaining trends*<br>*Testing chemical properties*<br>*Testing physical properties* | **Metals & Uses**<br>**Skills**<br>*Relating materials to their properties*<br>*Testing substances*<br>*Identifying reaction trends*<br>*Problem solving*<br>*Analysing data* | **More on Electricity**<br>**Skills**<br>*Using table to display data*<br>*Relationships from graphs*<br>*Building circuits*<br>*Investigating circuits*<br>*Recording data* |
| | **Breathing and Respiration**<br>**Skills**<br>*Identifying gas exchange systems*<br>*Writing word equations*<br>*Relating models to life processes*<br>*Using means and ranges*<br>*Relating knowledge to unknown examples*<br>*Analysing and explaining graph* | **Forces & Motion**<br>**Skills**<br>*Resolving forces*<br>*Calculating speed*<br>*Analysis and drawing graphs*<br>*Evaluating forces in equilibrium* | **Making Materials**<br>**Skills**<br>*Synthesis composite materials*<br>*Investigating the properties of a material*<br>*Spotting trends in data and graphs* |
| **Online Provision** | A portion of homework is set on teams in the form of low stakes quizzing. All our lessons are uploaded onto Teams for students to access should they need to. In the event of class isolation, science also uses Educake, ActiveLearn and Quizlet as a remote learning tool | | |

**Edexcel Y10 Combined Science**

| Combined Science Y10 | Autumn 2020 | Spring 2021 | Summer 2021 |
|---|---|---|---|
| **Biology** | **B1**<br>1. Microscopes and biological drawing<br>2. Size and units<br>3. Plant and animal cells (CP)<br>4. Specialised cells<br>5. Bacterial cells<br>6. Enzymes<br>7. Enzyme action<br>8. Factors affecting enzymes (CP)<br>9. Transporting substances<br>10. Osmosis in potatoes (CP) | **B2 – B3**<br>1. Mitosis<br>2. Growth in plants & animals<br>3. Stem Cells<br>4. The nervous system<br>5. Neurotransmission speeds<br>6. Meiosis<br>7. DNA<br>8. Alleles<br>9. Inheritance<br>10. Gene mutation<br>11. Variation | **B4 – B5**<br>1. Human evolution<br>2. Darwin's theory<br>3. Classification<br>4. Breeds and varieties<br>5. Genes in agriculture and medicine<br>6. Health and disease<br>7. Non-communicable disease<br>8. Cardiovascular disease<br>9. Pathogens<br>10. Physical and chemical barriers<br>11. The immune system |
| **Chemistry** | **C1 – C4**<br>1. States of matter<br>2. Mixtures<br>3. Filtration and crystallisation<br>4. Paper chromatography<br>5. Distillation<br>6. Investigating inks (CP)<br>7. Structure of an atom<br>8. Atomic and mass number<br>9. Isotopes<br>10. Atomic number and the PT<br>11. Electronic configuration and PT | **C5 – C8**<br>1. Ionic bonds, lattice and properties<br>2. Covalent bonds<br>3. Molecular compounds<br>4. Allotropes of carbon<br>5. Properties of metals<br>6. Bonding models<br>7. Acids and alkalis<br>8. Indicators<br>9. Neutralisation<br>10. Solubility | **C9 - C12**<br>1. Empirical Formula<br>2. Conservation of mass<br>3. Moles<br>4. Electrolysis<br>5. Electrolysis of copper sulphate (CP)<br>6. Reactivity<br>7. Ores<br>8. Oxidation & Reduction<br>9. Life cycle assessment and recycling<br>10. Dynamic Equilibrium |
| **Physics** | **P1 – P2**<br>1. Vectors and scalars<br>2. Distance and velocity time graphs<br>3. Acceleration<br>4. Resultant forces<br>5. Newton's first law<br>6. Mass and weight<br>7. Newton's second law<br>8. Investigating acceleration (CP)<br>9. Newton's third law<br>10. Stopping distance | **P3 – P5**<br>1. Energy stores<br>2. Energy transfers<br>3. Efficiency<br>4. Renewable and non-renewable resources<br>5. Describing waves<br>6. Investigating waves<br>7. Refraction<br>8. Electromagnetic waves<br>9. Using long & short wavelengths<br>10. Dangers of EM waves | **P6 – P8**<br>1. Atomic Model<br>2. Inside Atoms<br>3. Electrons and orbits<br>4. Background radiation<br>5. Types of radiation<br>6. Decay<br>7. Half-life<br>8. Dangers of radioactivity<br>9. Work & Power<br>10. Vector Diagrams |

**Edexcel Y11 Combined Science**

| Combined Science Y11 | Autumn 2020 | Spring 2021 | Summer 2021 |
|---|---|---|---|
| **Biology** | **B6 – B7**<br>1. Photosynthesis<br>2. Factors affect photosynthesis<br>3. Light intensity & photosynthesis (CP)<br>4. Absorbing water and mineral ions<br>5. Transpiration and translocation<br>6. Hormones<br>7. Hormones and the menstrual cycle<br>8. The menstrual cycle<br>9. Control of blood glucose<br>10. Type 2 diabetes | **B8 – B9**<br>1. Efficient transport and exchange<br>2. The circulatory system<br>3. The heart<br>4. Cellular Respiration<br>5. Respiration rates (CP)<br>6. Ecosystems<br>7. Abiotic factors<br>8. Quadrats & transects<br>9. Parasitism and mutualism<br>10. Biodiversity<br>11. Water, carbon and nitrogen cycle | **Combined Science Revision and Exams** |
| **Chemistry** | **C13 – C15**<br>1. Group 1<br>2. Group 7<br>3. Halogens<br>4. Group 0<br>5. Rates of reaction<br>6. Factors affecting rates of reaction<br>7. Investigating reaction rates (CP)<br>8. Catalysts<br>9. Endo and exothermic reactions<br>10. Energy changes in reactions | **C16 – C17**<br>1. Hydrocarbons in crude oil<br>2. Fractional distillation<br>3. The alkane homologous series<br>4. Complete & incomplete combustion<br>5. Combustible fuels & pollution<br>6. Breaking down hydrocarbons<br>7. The early atmosphere<br>8. The changing atmosphere<br>9. The atmosphere today<br>10. Climate change | **Combined Science Revision and Exams** |
| **Physics** | **P9 – P11**<br>1. Electric Circuits<br>2. Current, potential difference<br>3. Current, energy and charge<br>4. Resistance<br>5. Investigating resistance (CP)<br>6. Power<br>7. Electrical Safety<br>8. Magnets and magnetic fields<br>9. Electromagnetism<br>10. Transformers | **P12 – P13**<br>1. Particles & Density<br>2. Investigating Density (CP)<br>3. Energy & changes of state<br>4. Energy calculations<br>5. Investigating water (CP)<br>6. Gas temperature and pressure<br>7. Bending and stretching<br>8. Investigating springs (CP)<br>9. Extension and energy transfers | **Combined Science Revision and Exams** |

**Edexcel KS4 Separate Biology**

| Combined Science Y11 | Autumn 2020 | Spring 2021 | Summer 2021 |
|---|---|---|---|
| **Y10** | **B1**<br>1. Microscopes<br>2. Plant and animal cells<br>3. Using microscopes (CP)<br>4. Specialised cells<br>5. Bacterial cells<br>6. Enzyme action<br>7. Enzyme activity<br>8. Factors affecting enzymes (CP)<br>9. Food tests (CP)<br>10. Transporting substances<br>11. Osmosis in potatoes (CP) | **B2 – B3**<br>1. Mitosis<br>2. Growth in plants & animals<br>3. Stem Cells<br>4. The brain<br>5. Brain & spinal cord problems<br>6. The nervous system<br>7. The eye<br>8. Neurotransmission speeds<br>9. Sexual and asexual reproduction<br>10. Meiosis<br>11. DNA & DNA extraction<br>12. Protein synthesis<br>13. Genetic variance and phenotypes<br>14. Mendel<br>15. Alleles<br>16. Inheritance<br>17. Gene mutation<br>18. Variation | **B4 – B5**<br>1. Human evolution<br>2. Darwin's theory<br>3. Classification<br>4. Breeds and varieties<br>5. Tissue culture<br>6. Genes in agriculture and medicine<br>7. GM and agriculture<br>8. Fertilisers and biological control<br>9. Health and disease<br>10. Non-communicable disease<br>11. Cardiovascular disease<br>12. Pathogens<br>13. Spreading pathogens<br>14. Virus life cycles<br>15. Plant defences and diseases<br>16. Physical and chemical barriers<br>17. The immune system<br>18. Antibiotics (CP)<br>19. Monoclonal antibodies |
| **Y11** | **B6 – B7**<br>1. Photosynthesis<br>2. Factors affect photosynthesis<br>3. Light intensity & photosynthesis (CP)<br>4. Absorbing water and mineral ions<br>5. Transpiration and translocation<br>6. Plant adaptations<br>7. Plant hormones<br>8. Use of plant hormones<br>9. Hormones<br>10. Hormones and the menstrual cycle<br>11. Control of blood glucose<br>12. Type 2 diabetes<br>13. Thermoregulation<br>14. Osmoregulation<br>15. The kidneys | **B8 – B9**<br>1. Efficient transport and exchange<br>2. Factors affecting diffusion<br>3. The circulatory system<br>4. The heart<br>5. Cellular Respiration<br>6. Respiration rates (CP)<br>7. Ecosystems<br>8. Energy transfer<br>9. Abiotic factors<br>10. Quadrats & transects (CP)<br>11. Parasitism and mutualism<br>12. Biodiversity<br>13. Preserving biodiversity<br>14. Water, carbon and nitrogen cycle<br>15. Rates of decomposition | **Separate Biology Revision and Exams** |

**Edexcel KS4 Separate Chemistry**

| Combined Science Y11 | Autumn 2020 | Spring 2021 | Summer 2021 |
|---|---|---|---|
| **Y10** | **C1 – C7**<br>1. States of matter<br>2. Mixtures<br>3. Filtration and crystallisation<br>4. Paper chromatography<br>5. Distillation<br>6. Investigating inks (CP)<br>7. Drinking water<br>8. Structure of an atom<br>9. Atomic and mass number<br>10. Isotopes<br>11. Elements and the periodic table<br>12. Atomic number and the PT<br>13. Electronic configuration and PT<br>14. Ionic bonds, lattice and properties<br>15. Covalent bonds<br>16. Molecular compounds<br>17. Allotropes of carbon<br>18. Properties of metals<br>19. Bonding models | **C8 – C10**<br>1. Acids and alkalis & indicators<br>2. Looking at acids<br>3. Bases & Salts<br>4. Preparing copper sulfate (CP)<br>5. Alkalis and balancing equations<br>6. Neutralisation (CP)<br>7. Reactions of acids with carbonates<br>8. Solubility<br>9. Empirical Formula<br>10. Conservation of mass<br>11. Moles<br>12. Electrolysis<br>13. Electrolysis of copper sulphate (CP)<br>14. Products from electrolysis | **C11 – C14**<br>1. Reactivity<br>2. Ores<br>3. Oxidation & Reduction<br>4. Life cycle assessment and recycling<br>5. Dynamic Equilibrium<br>6. Transition metals<br>7. Corrosion<br>8. Electroplating<br>9. Alloying<br>10. Uses of metals and their alloys<br>11. Yields<br>12. Atom economy<br>13. Concentrations<br>14. Titrations & Calculations<br>15. Acid Alkali titration<br>16. Molar volume of gases |
| **Y11** | **C14 – C20**<br>1. Fertilisers and the Haber processes<br>2. Factors affecting equilibrium<br>3. Chemical cells and fuel cells<br>4. Group 1<br>5. Group 7<br>6. Halogens<br>7. Group 0<br>8. Rates of reaction<br>9. Factors affecting rates of reaction<br>10. Investigating reaction rates (CP)<br>11. Catalysts and activation energy<br>12. Endo and exothermic reactions<br>13. Energy changes in reactions<br>14. Hydrocarbons in crude oil and natural gas<br>15. Fractional distillation of crude oil<br>16. The alkane homologous series<br>17. Combustible fuels and pollution | **C21 – C26**<br>11. Breaking down hydrocarbons<br>12. The early atmosphere<br>13. The changing atmosphere<br>14. The atmosphere today<br>15. Climate change<br>16. Alkenes & Alkanes<br>17. Ethanol production<br>18. Alcohols<br>19. Combustion of alcohols (CP)<br>20. Carboxylic acid<br>21. Polymer properties and uses<br>22. Condensation & Addition polymerisation<br>23. Flame tests and photometry<br>24. Test for negative and positive ions<br>25. Identifying ions (CP)<br>26. Composite materials<br>27. Nanoparticles | **Separate Chemistry Revision and Exams** |

**Edexcel KS4 Separate Physics**

| Combined Science Y11 | Autumn 2020 | Spring 2021 | Summer 2021 |
|---|---|---|---|
| **Y10** | **P1 – P3**<br>1. Vectors and scalars<br>2. Distance and velocity time graphs<br>3. Acceleration<br>4. Resultant forces<br>5. Newton's first law<br>6. Mass and weight<br>7. Newton's second law<br>8. Investigating acceleration (CP)<br>9. Newton's third law<br>10. Momentum<br>11. Stopping distances<br>12. Braking distance and energy<br>13. Crash Hazards<br>14. Energy stores & transfers<br>15. Energy efficiency<br>16. Keeping warm<br>17. Stored energies<br>18. Renewable and non-renewable resources | **P4 – P5**<br>1. Describing waves<br>2. Investigating waves<br>3. Refraction<br>4. Waves crossing boundaries<br>5. Ears and hearing<br>6. Ultrasound<br>7. Infrasound<br>8. Ray diagrams (CP)<br>9. Colour<br>10. Lenses<br>11. Electromagnetic waves<br>12. Using long & short wavelengths<br>13. Radiation & temperature<br>14. Investigating radiation (CP)<br>15. Dangers of EM waves | **P6 – P8**<br>1. Atomic Model<br>2. Inside Atoms<br>3. Electrons and orbits<br>4. Background radiation<br>5. Types of radiation<br>6. Decay<br>7. Half-life<br>8. Radioactive decay<br>9. Using radioactivity<br>10. Dangers of radioactivity<br>11. Nuclear energy<br>12. Nuclear fission & fusion<br>13. The solar system<br>14. Gravity & orbits<br>15. Life cycles of stars<br>16. Red shift<br>17. Origin of the Universe<br>18. Work & Power |
| **Y11** | **P9 – P12**<br>1. Objects affecting each other<br>2. Vector diagrams<br>3. Rotational forces<br>4. Electric Circuits<br>5. Current, potential difference<br>6. Current, energy and charge<br>7. Resistance<br>8. Investigating resistance (CP)<br>9. Power<br>10. Electrical Safety<br>11. Static electricity<br>12. Electrical fields<br>13. Magnets and magnetic fields<br>14. Electromagnetism<br>15. Magnetic forces<br>16. The national grid<br>17. Transformers | **P12 – P15**<br>1. Particles & Density<br>2. Investigating Density (CP)<br>3. Energy & changes of state<br>4. Energy calculations<br>5. Investigating water (CP)<br>6. Gas temperature and pressure<br>7. Gas pressure & volume<br>8. Bending and stretching<br>9. Investigating springs (CP)<br>10. Extension and energy transfers<br>11. Pressure in fluids<br>12. Pressure & upthrust | **Combined Science Revision and Exams** |

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