**Beamont Collegiate Academy Curriculum Map**

**Year: 7**

**Subject: Science**

| Intent | Implementation | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
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| **Clarity around knowledge** | **Theme / topic** | Working Scientifically<br>The Particle Model (Continued into HT2) | The Particle Model<br>Solubility and Separation | Cells and Organisation<br>Fundamental Forces (Continued into HT4) | Fundamental Forces<br>Core Chemistry (Continues into HT5) | Core Chemistry<br>Reproduction | Space Science<br>Ecology |
| | **Key substantive knowledge** | **Biology:**<br><br>**N/A** | **Biology:**<br><br>**N/A** | **Biology:**<br><br>**Structure and Function of Living Things**<br><br>**Cells and Organisation**<br><br>Cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope.<br><br>The functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts.<br><br>The similarities and differences between | **Biology:**<br><br>**N/A** | **Biology:**<br><br>**Reproduction**<br><br>Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta.<br><br>**Health**<br>The effects of recreational drugs (including substance misuse) on behaviour, health and life processes. | **Biology:**<br><br>**Material Cycles and Energy**<br><br>**Photosynthesis**<br><br>The dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere.<br><br>**Interactions and interdependencies**<br><br>The interdependence of organisms in an |

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| | | | | plant and animal cells.<br><br>The structural adaptations of some unicellular organisms.<br><br>The hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms. | | **Genetics and Evolution**<br><br>Inheritance, chromosomes, DNA and genes. | ecosystem, including food webs and insect pollinated crops.<br><br>How organisms affect, and are affected by, their environment, including the accumulation of toxic materials.<br><br>**Genetics and Evolution**<br><br>Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction.<br><br>The importance of maintaining biodiversity and the use of gene banks to preserve hereditary material. |

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| | | **Chemistry:**<br><br>**The Particulate Nature of Matter**<br><br>The properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure.<br><br>Changes of state in terms of the particle model.<br><br>**Pure and Impure Substances**<br><br>The concept of a pure substance.<br><br>Diffusion in terms of the particle model.<br><br>Mixtures, including dissolving.<br><br>Simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography. | **Chemistry:**<br><br>**See HT1** | **Chemistry:**<br><br>**N/A** | **Chemistry:**<br><br>**Atoms, elements and compounds**<br><br>A simple (Dalton) atomic model.<br><br>Differences between atoms, elements and compounds.<br><br>Chemical symbols and formulae for elements and compounds.<br><br>Conservation of mass changes of state and chemical reactions.<br><br>Chemical Reactions Chemical reactions as the rearrangement of atoms.<br><br>Representing chemical reactions using formulae and using equations.<br><br>The pH scale for measuring acidity/alkalinity; and indicators.<br><br>Reactions of acids with metals to | **Chemistry:**<br><br>**See HT4** | **Chemistry:**<br><br>**N/A** |

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| | | | | | produce a salt plus hydrogen.<br><br>**The Periodic Table**<br><br>The varying physical and chemical properties of different elements.<br><br>The principles underpinning the Mendeleev Periodic Table.<br><br>The Periodic Table: periods and groups; metals and non-metals.<br><br>How patterns in reactions can be predicted with reference to the Periodic Table.<br><br>The properties of metals and non-metals. | | |
| | | **Physics:**<br><br>**Matter – Physical Changes**<br><br>Conservation of material and of mass, and reversibility, in | **Physics:**<br><br>**See HT1** | **Physics:**<br><br>**Describing Motion**<br><br>Speed and the quantitative relationship between average speed, | **Physics:**<br><br>**See HT3** | **Physics:**<br><br>**N/A** | **Physics:**<br><br>**Space Physics**<br><br>Gravity force, weight = mass x gravitational field strength (g), on Earth g=10 N/kg, |

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| | | melting, freezing, evaporation, sublimation, condensation.<br><br>Similarities and differences, between solids, liquids and gases<br><br>Brownian motion in gases<br>Diffusion in liquids and gases driven by differences in concentration.<br><br>**Matter – The Particle Model**<br><br>The differences in arrangements, in motion and in closeness of particles explaining changes of state and shape.<br><br>**Matter – Energy in Matter**<br><br>Changes with temperature in motion and spacing of particles. | | distance and time (speed = distance ÷ time).<br><br>**Forces**<br><br>Forces as pushes or pulls, arising from the interaction between two objects.<br><br>Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces.<br><br>Forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water.<br><br>Forces measured in newtons, measurements of stretch or compression as force is changed. | | | different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only).<br><br>Our Sun as a star, other stars in our galaxy, other galaxies.<br><br>The seasons and the Earth's tilt, day length at different times of year, in different hemispheres.<br><br>The light year as a unit of astronomical distance. |

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| | | | | Non-contact forces: gravity forces acting at a distance on Earth and in space, forces between magnets and forces due to static electricity.<br><br>**Pressure**<br><br>Pressure measured by ratio of force over area – acting normal to any surface.<br><br>**Balanced Forces**<br><br>Opposing forces and equilibrium: weight held by stretched spring or supported on a compressed surface.<br><br>**Forces and Motion**<br><br>Forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only).<br><br>Change depending on direction of force and its size. | | | |

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| | **Disciplinary knowledge** | Scientific attitudes<br>Experimental skills and investigations<br>Analysis and evaluation<br>Measurement | Scientific attitudes<br>Experimental skills and investigations<br>Analysis and evaluation<br>Measurement | Scientific attitudes<br>Experimental skills and investigations<br>Analysis and evaluation<br>Measurement | Scientific attitudes<br>Experimental skills and investigations<br>Analysis and evaluation<br>Measurement | Scientific attitudes<br>Experimental skills and investigations<br>Analysis and evaluation<br>Measurement | Scientific attitudes<br>Experimental skills and investigations<br>Analysis and evaluation<br>Measurement |
| **Clarity around sequencing** | **Main links across the curriculum** | Working Scientifically develops on the KS2 Science Curriculum and underpins all of the units that follow in KS3.<br>The Particle Model unit underpins the Separating Techniques unit (Y7). | Separating Techniques develops on The Particle Model unit (Y7). | Cells and Organisation will be developed further in Years 7 and 9.<br>Fundamental Forces will be developed further in the Space Science unit (Y7) and Forces and Motion (Y9). | Core Chemistry will be developed further in Years 8 and 9. | Reproduction and Growth develops on the Cells and Organisation unit (Y7).<br>Reproduction will be developed further in the Plant Biology unit (Y8). | Space Science develops on the Fundamental Forces unit (Y7).<br>Ecology will be developed further in Years 8 and 9. |
| | **Authentic cross curricular links** | Maths: Graphs, mean | Maths: Graphs, mean, range | Maths: equations | Maths: equations<br>PE: speed | Maths: equations<br>PSHE: Sex and relationships | Geography: habitats and populations, agriculture |
| **Vocabulary** | **Key words** | **Selected key words:**<br>Hazard, variable, qualitative, quantitative, diffusion, pressure, evaporating, condensing | **Selected key words:**<br>Diffusion, pressure, evaporating, condensing, soluble, insoluble, solute, solvent, saturated | **Selected key words:**<br>Organelle, mitochondria, chloroplast, force, Newton, Pascal, density | **Selected key words:**<br>Atom, element, compound, pH, | **Selected key words:**<br>asexual, sexual, gamete, fertilisation | **Selected key words:**<br>Satellites, gravity, orbit, hemisphere, ecosystem, biodiversity, adaptation, bioaccumulation, biomagnification |
| **Assessment** | **Summative assessment** | End of Unit Summative Test<br>Formative Assessment Throughout | End of Unit Summative Test<br>Formative Assessment Throughout | End of Unit Summative Test<br>Formative Assessment Throughout | End of Unit Summative Test<br>Formative Assessment Throughout | End of Unit Summative Test<br>Formative Assessment Throughout | End of Unit Summative Test<br>Formative Assessment Throughout |

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| **Links to the real world / careers / PD** | | Real world:<br>Covid vaccine development<br>Careers:<br>Academic researcher, industrial chemist, pharmaceutical scientist | Real world:<br>Forensic and analytical science<br>Careers:<br>Academic researcher, industrial chemist, pharmaceutical scientist | Real world:<br>IVF, cancer, medical imaging, disease, coronavirus pandemic<br>Careers:<br>Chemist, microbiologist, zoologist, botanist, NHS careers | Real world:<br>Air, sea and land travel<br>Careers:<br>Industrial chemist, engineer, pilot | Real world:<br>Air, sea and land travel, IVF, sex and pregnancy<br>Careers:<br>Engineer, pilot, nurse, gynaecologist, fertility specialist, other NHS careers | Real world:<br>Weather, environment<br>Careers:<br>Astronomer, atmospheric scientist, ecologist, environmental biologist, zoologist |