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| **Year 7:** [Science is everything][From atoms to machines] |
| **Topics** | **Why we teach this** | **Links to last topic** | **Links to future topics** | **Key skills developed** | **Cultural capital opportunities** | **Links to whole school curriculum** |
| **Autumn 1** [What is everything made of?] |
| Scientific EnquiryParticles | So we understand how scientific investigations are carried out and used in the real world To learn what particles are and how everything is made of them | Draws on KS2 Sciences and real-world observation | Feeds into Atoms, elements, compounds and purity, cells and reproduction | Application of knowledge, making links, practicals, ethical debate, critical evaluation, collecting data, making predictions using scientific knowledge | Lab work: practical science. Careers in lab work, forensics, genetics, counselling.Pharmacy, developing new drugs, agriculture, industry | Maths in scientific enquiry. Art particle diagrams.English, debate where particles came from.History: how did it all begin? |
| **Autumn 2** [The importance of atoms for us to exist] |
| Atoms, Elements and compounds | To understand the impact of Chemistry on our everyday lives. To know what matter is made ofTo know how to separate mixtures | Draws on particles and scientific enquiry | Feeds into cells, forces, energy, motion and pressure, earth and atmosphere and space | Application of knowledge, making links, practical science, critical evaluation, making predictions using scientific knowledge and understanding | Lab work. Careers. Real world applications. Chemists-in the drug industry | History- of the discovery of elements.D&T-food tech Maths-making calculations  |
| **Spring 1** [What are we made of and how were we made?] |
| Cells Reproduction | So we understand the building blocks of life To learn the role of reproduction in animals and plants. | Draws on Particles and Scientific enquiry, atoms and KS2 | Feeds into all biology | Application of knowledge, making links, practical science, critical evaluation, making predictions using scientific knowledge and understanding | Biologists, genetics, doctors, medical scientists, careers, history, equality and diversity, health | History: microscopyMaths: magnificationPSHE: reproduction Art-making 3D cell models  |
| **Spring 2** [How forces affect sports and space travel] |
| Forces | To understand the impact of physics on our lives and how it works. What are forces and what they do? | Draws on Particles and Scientific enquiry,  | Feeds into magnets, motion and pressure, energy and space  | Application of knowledge, making links, practical science, critical evaluation | Lab work. Careers. Astronauts, how force affect space travel and in sports.  | Maths in physics, drawing tables, and making force calculations. |
| **Summer 1** [How physics shapes the way we live] |
| Energy | To understand what energy is and how it works | Draws on KS2 Sciences, particles and KS2 | Feeds into all physics, biology and chemistry | Recall, apply, critically evaluate, maths, writing, Present observations and data using appropriate methods  | Careers, history, ethics of using resources, social/ economic/ environmental impact, car safety, machines and engineering | Maths in physics, drawing tables, and making force calculations.DT: design |
| **Summer 2** [How things move] |
| Motion and pressureSkeleton and gas exchangeDigestion and Health | To understand how speed works and how air affects us To understand movement, how organisms’ function, how systems work together, how and why it is important to stay healthy | Draws on forces, particles, energy, cells,  | Feeds into magnetism, Cells B1, Organisation B2, Infection B3, Forces P5, Bioenergetics B4, Homeostasis B5 | Recall, apply, critically evaluate, biological drawing, maths, writing, present observations and data using appropriate methods and examining risk factors | Careers, history, equality, diversity, ethics of using resources, social/ economic/ environmental impact. car safety, machines + engineering, drugs, nutrition, environment | Maths: tables, and energy calculations.DT: designPE – physical health, movement and fitnessFood Tech – healthy diet |

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| **Year 8:** In the WorldEverything from how organisms’ function, stay healthy and pass on their genes, to how chemicals react and how waves travel.  |
| **Topics** | **Why we teach this** | **Links to last topic** | **Links to future topics** | **Key skills developed** | **Cultural capital opportunities** | **Links to whole school curriculum** |
| **Autumn 1** – In the lab- Chemicals |
| Periodic tableChemical reactions | Development, discovery and uses of the elements through time. How the scientific community works togetherHow and why chemical reactions occur. Reactivity of elements  | Atomic structure Atomic structure, particles and periodic table organisation | GCSE: Atoms C1, Bonding C2, Quantitative C3, Analysis C8, Atmosphere C9, Atoms P4GCSE: C1, C2, C3, Changes C4, Energy C5, Rate C6, Organic C7, C9, Resources C10 and P4 | Analysis, communication, enquiry, examining risks, scientific drawing, working scientifically (WS) – practical skills | Careers, history, industry, environmental, change and development of ideas over time | History – How medicine changed over timeFood Tech – Physical and chemical changes (cooking and dissolving)Maths – Balancing equations, means, adding negative/positive numbers  |
| **Autumn 2** – In the hospital – Waves |
| Waves: sound and light | How do we hear and see? Importance of waves in everyday life: cleaning, communication, medical  | Particles, motion and pressure, skeleton & gas exchange  | GCSE: Particles P3, Atoms P4 and Waves P6 | Analysis, Communication, Enquiry, Evaluating risk factors  | Careers, history, communication, health | IT – Communication Music – SoundMaths – speed  |
| **Spring 1** – In industry – Reactions |
| Metals and acids | Properties and uses of metals | Chemical reactions, Periodic table, energy, forces | GCSE– Atoms C1, Bonding C2, Quantitative C3, Changes C4, Energy C5, Particles P3 and Atoms P4 | Analysis, communication, maths, WS, practical skills, enquiry, data, risk, scientific drawing | Careers, history | DT – Material properties |
| **Spring 2** – Populations - Genetics |
| Inheritance | What makes you, you and where those traits come from. Understanding evolution and adaptations | Cells and reproduction | GCSE topics – Cell B1, Infection B3, Inheritance B6 and Ecology B7.  | Communication, ethical considerations, analysis, critique | Careers, history, equality, health diversity, ethics,  | RE – Evolution v. CreationEnglish – Ethical debateHistory – Evolution Geography – Fossils |
| **Summer 1**- What concepts and ideas make useful devices and machines work? |
| Magnetism  | To show how physics relates to the real world on both smaller and larger scales, how these concepts make life easier for humans and how they can be applied. | Links to Particles, Forces, Atoms | Space and GCSE topics P2, P5 P6, P7 – Electricity, Forces, Magnets, Waves | Application of knowledge, making links, practical work, experimental design debate, critical evaluation, life skills. | Practical work, Careers in industry and engineering, engineering design, vocational skills and apprenticeships.  | Maths – equations, DT – design skillsEnglish – debate.History – Development over timeLife skills – electricity bills. |
| **Summer 2** – Application in the world  |
| Science fair | What do you want to know? – How to be a scientist! | Can be linked to any and all topics.  | Can be linked to any and all future topics depending on chosen project | Planning, enquiry, analysis, review, WS, practical skills, data communication,  | Careers  | Anything and everything across the curriculum! |

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| **Year 9:** [Atomic to Cosmic and things in- between][What are we made of, how are we organised and how do we function in the universe to survive?] |
| **Topics** | **Why we teach this** | **Links to last topic** | **Links to future topics** | **Key skills developed** | **Cultural capital opportunities** | **Links to whole school curriculum** |
| **Autumn 1** [What concepts and ideas make useful devices and machines work?] |
| Magnetism and Electricity | To show how physics relates to the real world on both smaller and larger scales, how these concepts make life easier for humans and how they can be applied. | Links to Particles, Forces, Atoms | Space and GCSE topics P2, P5 P6, P7 – Electricity, Forces, Magnets, Waves | Application of knowledge, making links, practical work, experimental design debate, critical evaluation, life skills. | Practical work, Careers in industry and engineering, engineering design, vocational skills and apprenticeships.  | Maths – equations, DT – design skillsEnglish – debate.History – DevelLife skills – electricity bills. |
| **Autumn 2** [How does the earth and the cosmos interact and influence each other?] |
| Ecosystems, Earth’s Atmosphere  | To understand the interactions of organisms and the planet and how they affect each other. | Cells, digestion, health, skeleton, gas exchange, chem. reactions, repro, electricity, atoms, periodic table, forces | B1, B2, B4, B7C9, C10 P5, P8  | Application of knowledge, making links, practical work ethical and environmental debate, critical evaluation. | Practical work, Careers in industry, engineering, environment, politics. | English – ethical debate, Geography – Environment, Maths – Interpreting – graphs. |
| **Spring 1** [What are the building blocks of living and non-living things?] |
| SpaceAQA GCSE B1Cells  | To understand our place in the Universe.To understand the structure and function of the basic units that living and non- living entities are made up of. | Builds on cells, gas exchange, atoms, periodic table, forces, waves | Links to all biology, P4, P8. | Knowledge application, making links, practical work, critical evaluation, observational skills. | Practical work, Careers in industry, engineering, microbiology, medicine health care. | English – Ethical debate, Maths – Numerical skills History – development over time. PE – body, |
| **Spring 2** [What are the building blocks of living and non-living things?] |
| AQA GCSE P3 ParticlesC1 Atoms | To understand what all matter is made of | Builds on Particles, Energy / Heat, Forces, Electricity, Motion and Pressure. | All biology, chemistry and physics | Application of knowledge, making links, practical work, critical evaluation, design skills | Practical work, Careers in industry, engineering, environmental, politics. | Maths – Equations, English, DT -Design  |
| **Summer 1** [How do the building blocks of living things function together?] |
| B2 Organisation | How do cells work together to allow living things to operate effectively? | Builds on gas exchange, health, B1. | B4, B5 | Application of knowledge, making links, practical work, evaluation. | Practical work, Careers in industry, medicine, environmental awareness | Maths – Graphs, PE – body, English – Interpretation, DT – Food  |
| **Summer 2** [How are all things held together?] |
| C2 Bonding | In what different ways are atoms held together? | Builds on particles, Atoms, Chemical reactions, C1 –Atoms,  | C3, C4,  | Application of knowledge, making links, practical work, critical evaluation. | Practical work, Careers in industry, engineering, pharmacy, medicine. | Maths - Numerical skills, English – Explanations. |

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|  **jAutumn 1** [Deduce the atom, bonds and crack the moles] |
| * 1. Atomic structure
	2. Amount of Substance
 | To understand how properties depend on atom structure and arrangement of electrons.So we can make the relatively small entities workable using moles. | GCSEChem: C1,C3Physics: P4 | Bonding, Energetics, Periodicity, Acids, bases and pH, organic analysis | Understanding abstract ideas, Maths, lab work | Lab work, spectrometer, production of substances,  | Maths-calculations, Physics-atoms,History of atom  |
| **Autumn 2** [Cracking physical chemistry and studying bonding] |
| * 1. Bonding
	2. Energetics
 | So we can understand how atoms/ions are held together to give different structures.So we can determine the energy changes. | GCSE Chemistry: C2, C5+6 | Thermodynamics, organic/inorganic chemistry, polymer, isomerism,  | abstract ideas, Maths, application, lab work | Lab work, designing boilers, internal combustion engines | Maths: Calculations,Biology: DNA structure, aerobic & anaerobic reactions |
| **Spring 1** [Carry out quicker reactions or slow them down, understand the complexity of carbon compounds, discover isomerism] |
| * 1. Kinetics

3.1 Intro Organic Chemistry | So as chemists we can alter the conditions to affect the speed of the reaction. So we understand the vast synthetic materials created by Chemists.  | GCSE Chem: C5+6, C7 | Rate equations and equilibrium constants, A2 organic chemistry | Understanding abstract ideas, Maths, application | Synthetic material manufacture, drugs, medicine & plastic | Maths: Calculations,Biology: Enzymes, exchange surface, biological molecule |
| **Spring 2** [Let equilibria do it’s magic, explore in detail the environmental consequences human cause] |
| 1.6 Equilibria and Redox3.2 Alkanes and Halogenoalkanes  | So we can determine for far a reaction will go. So we understand the use of materials extracted from Earth. | GCSE Chem: C5+6, C7 | Rate equations and equilibrium constants, A2 organic chemistry | Understanding abstract ideas, Maths, application, lab work | Chemical industry, environmentalists, Pharmaceuticals | Biology: photosynthesis & respirationMaths-CalculationsGeography-Ozone  |
| **Summer 1** [The uniqueness of the element position in periodic table, electrophilic reactions, beneficial uses of alcohol & enhance you analytical skills] |
| 2.1 + 2.2 Periodicity 3.3 Alkenes and alcohols 3.4 Organic Analysis | So we understand how historians have laid out the elements and why.So we can understand how alkenes and alcohols are utilized in everyday lifeSo we can apply organic compounds knowledge into identification of substances. | GCSE Chem C1, C7, C8, C10 | A2 organic and inorganic chemistry.  | Constructing & deducing abstract concepts, analytical techniques | Lab work, forensics, water purification, product synthesis, sustainability, agriculture  | Biology: biological molecules  |
| **Summer 2** [The Science of Memory and pathway of progression] |