High Point Academy Curriculum Overview – Science Connectors

Year Group	Intent/Rationale	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 7	In Year 7, it will be assumed that prior science learning is minimal. Students will start by learning the foundational concept in science. They will learn what experiments are and how they are carried out and documented. They will learn about the building blocks of life – cells followed by the building blocks of all matter – particles. They will then build on these concepts learning about how cells make organs and their roles followed by how the particles make up elements and the ways in which elements can interact. Once more accustomed to science learning we will finally move onto the foundational physics topic of waves and illustrated the movement of energy using waves through sound	**Working scientifically** Students will learn about the scientific method and how to carry out scientific investigations. They will learn to handle basic scientific equipment safely and how to write up, record and evaluate practical investigations. Students may carry out investigations into thermal insulation and flame test.	**Cells** Students will explore the microscopic world of cells, starting with observation techniques and magnification calculations. They'll engage in practical activities like observing onion cells and comparing plant and animal cells. Specialized cell types and the movement of substances within cells will be investigated, alongside the exploration of unicellular organisms.	**Particles and their behavior** This topic introduces students to the fundamental nature of matter through the particle model. They'll explore different states of matter, observe changes of state like melting and boiling, and investigate diffusion phenomena. Gas pressure and other behaviors of particles will also be explored to deepen understanding.	**Structure and function** Students will delve into the hierarchical organization of living organisms, from cells to organ systems. They'll explore gas exchange in organisms and the mechanics of breathing, as well as the structure and function of the skeletal and muscular systems.	**Elements and reactions** This dual-topic covers the basic building blocks of matter, including elements, atoms, and compounds. Students will learn to represent chemical substances using formulas and symbols and explore various types of chemical reactions, including synthesis, decomposition, and combustion.	**Sound and waves** Students will investigate the nature and properties of sound waves, including loudness and pitch. They'll explore how sound energy is transferred and detected, as well as phenomena like echoes and ultrasound. The topic will also cover the relationship between sound and energy transfer.
Year 8	In Year 8, students will build upon their scientific foundation established in Year 7, exploring topics that deepen their understanding of the natural world. Building upon their understanding of cells in tear 7, students will learn about reproduction, investigating how specialized cells and biological systems contribute to the	**Reproduction** This topic explores the processes of reproduction in living organisms, including adolescence, reproductive systems, and fertilization.	**Acids and alkali** Students will explore the properties of acids and alkalis, including pH and indicators. They'll investigate neutralization reactions and learn	**Light** Students will study the properties of light, including reflection and refraction. They'll explore how light is detected by the eye and cameras, as well as the nature	**Periodic table** This topic introduces students to the organization of elements in the periodic table. They'll explore the properties and trends of metals, non-metals, and	**Health and lifestyle** Students will explore the relationship between diet, nutrition, and health, including food testing and nutrient disorders.	**Forces** This topic introduces students to the fundamental principles of forces and motion. They'll explore different types of forces,

	development and growth of living organisms. They will build on their understanding of particles and their properties through the study of acids and alkali. Additionally, students will build on their learning of waves by exploring the properties of light, connecting concepts of wave mechanics to the behavior of electromagnetic radiation. By learning about the organization of elements in the periodic table, students will deepen their understanding from year 7 of the fundamental building blocks of matter and their behavior. Students will explore the impact of health and lifestyle choices on well-being, drawing connections between biological processes from earlier in the year and personal health. This will foster a holistic understanding of science and its applications in everyday life.	Students will learn about the development of a fetus, the menstrual cycle, and mechanisms of pollination and seed dispersal.	to make salts. Practical activities will involve testing and identifying acids and alkalis.	of color. Practical activities may involve experiments with optics and light-based technologies.	metalloids, as well as the behavior of elements in different groups and periods. Students may also participate in the internationally recognized CREST awards. Designing, carrying out and evaluating an experiment to answer a scientific question.	They'll investigate the effects of unhealthy lifestyles and learn about drugs, alcohol, and smoking.	including squashing, stretching, drag forces, and gravity. Practical activities may involve experiments with force measurement and analysis.
Year 9	In Year 9, students advance their scientific understanding, building upon foundational concepts. They explore various forms and transfers of energy, building on Year 7 knowledge of waves. Building on reproduction learning in year 8 students will Deepen their understanding into ecosystems investigating intricate relationships within biological communities. They will apply their understanding of particles to explore separation techniques. We will investigate electricity and magnetism building on our	**Energy** Students will explore the diverse forms and transfer of energy. They'll investigate the relationship between food, fuels and energy. We will also look at energy transfer through temperature changes and radiation. The topic	**Ecosystems** This topic delves into the intricate relationships within ecosystems. Students will learn about photosynthesis, mineral cycling, and food chains/webs. Practical activities may involve investigations into photosynthesis and ecological surveys.	**Separation techniques** Students will explore methods used to separate mixtures and purify substances. They'll learn about filtration, evaporation, distillation, and chromatography techniques. Practical activities will involve hands-	**Adaption and inheritance** This topic investigates how organisms adapt to their environment and inherit traits from their parents. Students will explore concepts such as natural selection, genetic variation, and evolutionary processes.	**Electricity and magnetism** Students will delve into the principles of electricity and magnetism. They'll explore electrical circuits, conductors, and insulators, as well as magnetic fields and electromagnetism. Practical activities may involve constructing circuits	**The earth** This topic explores the geological processes and features of the Earth. Students will learn about the Earth's structure, rock types, and geological cycles. They'll also investigate environmental

	learning of energy and forces in year 8. In the Earth students will learn about the geological processes underpinning the structure of the planet connecting to broader environmental issues. Practical investigations play a pivotal role, fostering critical thinking skills and preparing students for advanced scientific inquiry in Entry Level Practical Assessment.	also covers energy resources and power generation.		on experimentation and application of separation methods.	Practical activities may include experiments on variation and adaptation.	and investigating magnetic properties.	issues such as climate change and recycling.

By the end of KS3 ……..

By the end of KS3, students will have developed a strong foundation in scientific inquiry and understanding. They will have explored key concepts in biology, chemistry, and physics, including the structure and function of cells, the properties of matter and energy, and the principles of waves and electromagnetic radiation. Through practical investigations and inquiry-based learning, students will have honed their critical thinking skills and developed the ability to apply scientific principles to real-world phenomena.

Year Group	Intent/Rationale	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 10	In Year 10, students delve deeper into understanding the human body in AQA Entry Level Single and Double award Component 1, connecting with their prior understanding of cells and bodily functions. Component 2 extends their knowledge of ecology and genetics, building upon earlier studies of ecosystems and adaptation. Component 3 explores elements, mixtures, and compounds, linking back to their KS3 understanding of particles and states of matter. Component 4 introduces practical applications of chemistry, connecting with their foundational knowledge of	**Component 1: The human body** Component 1: Focuses on the human body, covering cell biology, digestion, disease, and bodily coordination. Lessons include cell structure, blood circulation, and hormonal control. This will include an in class written and practical assessment.	**Component 3: Elements, mixtures & compounds** Centers on elements, mixtures, and compounds, discussing atoms, chemical reactions, and the periodic table. Lessons include states of matter, metals, and recycling. This will include an in class written and practical assessment.	**Component 5: Energy, forces and the structure of matter** Investigates energy, forces, and matter structure, encompassing topics like work, motion, and energy transfer. Lessons include speed, acceleration, and nuclear radiation. This will include an in class written and practical assessment.	**Component 2: Environment, evolution & inheritance** Explores environment, evolution, and inheritance, encompassing topics like ecosystems, feeding relationships, and genetic principles. Lessons cover photosynthesis, adaptation, and human impact on the environment.	**Component 4: Chemistry in our world** Examines chemistry in everyday life, addressing reactions, energy, and environmental concerns. Lessons cover acids, fuels, and water purification. This will include an in class written and practical assessment.	**Component 6: Electricity, magnetism and waves** Explores electricity, magnetism, and waves, covering electrical circuits, electromagnetism, and wave properties. Lessons include circuits, resistance, and electromagnetic waves. This will include an in class written and

	chemical reactions. This progression ensures an easier transition from KS3 to KS4 science.				This will include an in class written and practical assessment.		practical assessment.
Year 11	In Year 11, students integrate and extend their scientific knowledge. In cell biology and organisation students explore specialized cells, digestion, and the cardiovascular system. Building on prior understanding such as cells in Year 7 and bodily functions from Year 10. In infection response students draw on and explore learning from Year 10 component 1 and year 8 health and lifestyle topics. Ecology explores feeding relationships and human impacts on biodiversity expanding on Year 9 ecosystems and adaptation topics and year 10 component 2.	**Cell Biology** Starting with high yield paper 1 topics we expand on Year 10's Component 1. Students explore specialized cells, active transport, and the principles of cell division. Practical activities include investigating diffusion, osmosis, and stem cells.	**Organisation** Year 11 delves into the human digestive system, catalytic action of enzymes, and the cardiovascular system. Students study factors influencing enzyme activity and the role of blood vessels in circulation. Building on learning in year 7 structure and function and year 10 component 1	**Infection response** Building on Year 10, students study bacterial, viral, and fungal diseases, as well as human defense mechanisms. Practical activities may include aseptic technique and growing bacteria. We will also explore medication and vaccination to prepare student for life after school.	**Homeostasis** Moving onto GCSE Paper 2 topics students investigate hormonal coordination, reproductive hormones, and feedback mechanisms. Topics include blood glucose regulation, menstrual cycles, and contraceptive methods.	**Ecology** Connecting to Year 10's study of ecosystems, students explore feeding relationships, materials cycling, and environmental pollution. They investigate adaptations, trophic levels, and human impacts on biodiversity	**Revision and exams**
By the end of KS4…….. Students will have achieved AQA Single or Double Award Entry Level Science and AQA GCSE Biology.							