**Subject: Science-** *"Science can purify religion from error and superstition," said Pope St. John Paul II*

| | Student Development (Personal Development) and Curriculum Mapping | | | |
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| **Year Group** | **Be Respectful** (Character) | **Have an Understanding** (Community, Equality, Diversity, and Inclusion) | **Have Affection and Humour** (Mental Health and Well-Being) | **Be Independent and Resilient** (Careers, Aspirations and Preparation for Adulthood) |
| **Year 7** | Shared values of respect and collaboration are vital in developing character through investigative activities, such as using a microscope to examine particles, cells, and energy. Although students may find these complex topics challenging at first, consistent study, inquiry, and revisiting tough concepts can enhance resilience and promote a growth mindset. By engaging with the intricate relationships between particles, cellular structures, and energy transformations, learners can deepen their understanding | The KS3 science syllabus fosters understanding of community, equality, diversity, and inclusion by integrating scientific concepts with real-world applications. It encourages students to explore the impact of science on various communities, emphasizing the importance of diverse perspectives in scientific inquiry. Through collaborative projects and discussions, students learn to value different viewpoints and experiences, promoting inclusivity. The curriculum also addresses global challenges, such as climate change and health disparities, highlighting the need for equitable solutions. By engaging with these topics, students develop critical thinking skills and a sense of | The KS3 syllabus fosters affection and humour through collaborative activities, such as group projects and drama, which encourage empathy and social bonding. Additionally, incorporating humour in lessons can reduce stress and promote a positive classroom atmosphere, enhancing students' overall mental well-being<br><br>In summary, the KS3 syllabus aids in developing affection and humour by promoting social interactions and creating a supportive learning environment<br><br>Psychology concepts and terms: Affection, humour, mental health, well-being, social interactions, empathy | **Use of Seneca and linking key concepts to careers.**<br>**Science trip- Live scientist.**<br>**Linking key concepts to cultural capital**<br><br>Understanding the KS3 topics of particles, cells, and energy is crucial for various careers in science, healthcare, and environmental sectors. Mastery of these concepts prepares students for advanced studies in biology, chemistry, and physics, fostering critical thinking and problem-solving skills. Careers such as medicine, research, and engineering require a solid foundation in these areas. Moreover, knowledge of how energy transfers and cellular processes impact everyday life encourages responsible decision- |

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| | and appreciation of the natural world, ultimately fostering a supportive learning environment that encourages exploration and discovery | responsibility towards their community and the environment, reinforcing the principles of equality and diversity | | making and innovation, aligning with aspirations for sustainable living and health. This educational background equips students with the skills necessary for adulthood and future career success |
| **Year 8** | In the KS3 Year 8 science curriculum, respect can be demonstrated across various topics through collaborative work, adherence to safety rules, and ethical considerations. For example, in practical experiments related to sound, electricity, and magnetism, students must handle equipment carefully and follow safety guidelines, ensuring that everyone has the opportunity to participate. Sharing resources, respecting peers' contributions, and following the scientific process are central to fostering a respectful learning environment in these areas. | When studying light and space, atoms and the periodic table, and matter, respect is shown by appreciating diverse viewpoints on scientific models, space exploration, and the ethical implications of using Earth's resources. Students learn to value different scientific theories and the contributions of historical figures in science. Similarly, topics like earth's materials, photosynthesis, and digestion encourage students to respect the natural world, handle living organisms and specimens with care, and engage respectfully in discussions about environmental conservation and human health. | The curriculum emphasizes the importance of following safety rules and ethical guidelines, which helps students feel secure and supported during practical experiments. Lessons on digestion, photosynthesis, and earth's materials also contribute to mental well-being by encouraging students to reflect on the importance of environmental conservation and healthy living, linking scientific knowledge to everyday life and promoting a holistic sense of well-being. Through these aspects, the curriculum not only enhances scientific understanding but also contributes to students' mental health by creating a respectful, safe, and supportive learning environment. | Key concepts are linked to careers.<br>Science trip- Live scientist.<br>Linking key concepts to cultural capital<br><br>In subjects like light and space, atoms and the periodic table, and earth's materials, students are exposed to careers in fields such as physics, chemistry, environmental science, and engineering. By exploring these topics, they gain an understanding of the practical applications of science in the workplace, sparking aspirations for future career paths. Resilience is also nurtured as they learn to manage setbacks, such as when results don't align with expectations, teaching them how to overcome obstacles.<br><br>The curriculum's emphasis on digestion and photosynthesis links scientific knowledge to real-life issues, such as health, nutrition, and environmental conservation, preparing students for |

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| | | | | responsible adulthood. By understanding the impact of science on everyday life, students are better equipped to make informed decisions about their health, lifestyle, and future careers, fostering independence, resilience, and a strong sense of responsibility as they prepare for the challenges of adulthood. |
| **Year 9** | In Year 9, fostering respect as part of character development can be integrated into science lessons to create a positive and collaborative learning environment. For instance, during group experiments or investigations, such as exploring chemical reactions or biomechanics, students can be encouraged to listen to and respect each other's ideas, promoting an atmosphere of mutual respect and collaboration. When discussing sensitive topics like human reproduction or the effects of recreational drugs, students learn to approach these issues with respect for different perspectives and life experiences, understanding the importance of sensitivity and empathy in these | In Year 9, developing an understanding of community, equality, diversity, and inclusion can be woven into various science topics to encourage broader thinking. When studying heredity and DNA, for example, students can explore genetic diversity and how different traits are passed down across generations, highlighting the beauty of human diversity and dispelling myths surrounding race and identity. In lessons on the impact of recreational drugs, discussions can include how different communities are affected by substance misuse, encouraging empathy and understanding of the social factors at play. Photosynthesis and plant reproduction can be used as a way to talk about the interconnectedness of | In Year 9, humour can be an effective tool to make challenging science topics more engaging and relatable. For example, when exploring the structure and functions of the skeleton and muscles, students could compare antagonistic muscles to a comedic duo in a "push-pull" routine, making it easier to grasp the concept. Similarly, during lessons on breathing and gas exchange, light-hearted examples like holding your breath while explaining something complex can reduce anxiety around these topics. Humour can also help with sensitive subjects like reproduction, where comparing the placenta to an Amazon delivery service could make students feel more comfortable. When discussing heredity and DNA, likening genes to a family recipe for | Use of My GCSE and linking key concepts to careers. Science trip- Live scientist.<br>Linking key concepts to cultural capital Scientific investigation does not always provide the desired results and takes longer than anticipated which build resilience as patience is required during observations. |

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| | discussions. In lessons on ecosystems or environmental sustainability, respect for nature and the planet can be emphasized, encouraging students to value the environment and understand their role in protecting it. Through the study of scientific ethics—such as the impact of human activity on global warming or genetic modification—students can also learn the importance of respecting scientific processes and ethical considerations. By instilling respect for others, for the material they study, and for the world around them, students develop a stronger sense of character and responsibility. | all life on Earth, emphasizing how diverse ecosystems contribute to global food security, and underscoring the importance of community and shared responsibility in addressing environmental challenges. Lessons on respiration and exercise can also highlight inclusivity, discussing how conditions like asthma affect people differently and how scientific advancements help make society more accessible. By embedding these themes into the curriculum, students gain a deeper appreciation for diversity and inclusion, fostering an understanding of how science impacts and is influenced by diverse communities. | passing down traits such as a love for pizza can add a playful touch. In the study of photosynthesis, comparing plants to "solar-powered organisms" brings a smile while simplifying the science behind energy conversion. Even abstract topics like chemical reactions can become more engaging by portraying atoms as "party animals" that love bonding, or acids and metals as having "spicy arguments." Sound waves could be humorously linked to a teenager's dream of a soundproof room, while forces and energy might be explained using analogies of "pushy" and "lazy" friends. By incorporating humour into these topics, students can develop a positive attitude towards learning, fostering both engagement and resilience in tackling complex scientific ideas. | |
| **Year 10** | Shared values of respects for each other and collaborative working to build character through investigative activities and interacting with difficult and complex processes like the human nervous system, atomic structure | Photosynthesis Experiment Students conduct an experiment to measure the rate of photosynthesis in pondweed under different light intensities. They'll need to formulate a hypothesis, set up a controlled experiment, and draw conclusions | During key concepts learning like energy changes and the periodic table, huge emphasizes is placed on the notion that mistakes are part of the learning process and encourages a supportive environment where students can ask questions and share | Independent revision tools set by example and Utilise as a team via My GCSE science. Careers linked to key concepts are shared with students during lessons. |

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| | and mole concepts, students may initially struggle. Persistent study, asking questions, and revisiting challenging concepts help build resilience and a growth mindset. | from their results. This instils a methodical and evidence-based approach to learning, building community cohesion and equality as all human beings require the product of photosynthesis for survival. The same principles are applied to all scientific investigations. | their challenges. Over time, students learn to see errors as opportunities for growth, which builds resilience. Students participate in mini white board and turn and talk activities to enhance mental well-being. | |
| **Year 11** | The curriculum promotes the character trait of "Be Respectful" through collaborative learning, where students engage in group activities to explore complex topics like the nervous system, chemical reactions, and forces in motion. By working together, respecting each other's ideas, and persistently engaging with difficult concepts, students build both academic knowledge and respect for their peers, teachers, and the learning process. | Study of ethical implications of genetic engineering. They research topics like GMOs and cloning, then discuss the benefits and potential risks. This fosters ethical thinking and a sense of responsibility for scientific advancements. | The Year 11 curriculum supports mental health by having positive learning environment, especially during challenging topics like the nervous system, etc. A focus is placed on viewing mistakes as part of the learning process, creating a supportive space where students feel comfortable asking questions and sharing struggles. Activities like group discussions and interactive tasks, such as mini whiteboards and "turn and talk" sessions, help students engage with the material in a relaxed and open way, building resilience and supporting their mental well-being. | Independent revision tools set by example and Utilise as a team via My GCSE science. Careers linked to key concepts are shared with students during lessons. Teaching students to effectively manage time to use well in accordance to My GCSE content and revision. Exposure of techniques for taking notes and how to answer exam questions. Expanding literacy skills to grasp complex ideas and content. Showcasing and modelling on how the content they are learning are applied in the real world |
| **Year 12** | Respect for all living things is essential. Recognising that everything, from the tiniest microbe to the largest whale, is made up of fundamental chemical building blocks fosters an | Our biological unity is reflected in the common chemistry that underlies all life. Despite the incredible diversity we see in nature, every organism relies on the same basic compounds - carbohydrates for energy and | Understanding our biochemical nature brings insight into our emotional and mental wellbeing. The proteins and lipids that act as chemical messengers and hormones influence our moods, thoughts, and | Cells demonstrate remarkable independence in maintaining their internal environment while simultaneously participating in larger systems. This balance of autonomy and interconnection provides a model for |

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| | appreciation for our deep connection to nature. The universal genetic code and the shared need for water remind us that, at our core, all life is unified by the same basic elements and processes.<br>Students work collaboratively to carry out practical investigations. They help each other and share outcomes to learn from each other. | structure, lipids for cell membranes, proteins for cellular machinery, and nucleic acids for genetic information. This remarkable consistency across all living things demonstrates that beneath surface differences, we share fundamental similarities that unite us as part of Earth's living community. | feelings. This knowledge helps us appreciate how our mental health is connected to our biological processes, reminding us that taking care of our physical health supports our emotional wellbeing.<br><br>The way cells maintain harmony through signalling and communication reflects our own need for positive relationships. Just as cells work together to maintain health and recover from disease, our mental wellbeing depends on supportive connections. The remarkable stability of our cellular systems, maintained through complex interactions, reminds us of our innate resilience. Understanding this biological foundation of life can help us appreciate our capacity for recovery and growth | personal development. The evolutionary adaptability of cells shows us how resilience emerges from challenge and change. Understanding these cellular processes not only opens doors to scientific and medical careers but teaches us valuable lessons about achieving stability through adaptation. Just as cells selectively manage their boundaries through membrane transport, we too must learn to maintain healthy boundaries while engaging with our community.<br><br>A learner-centred approach to the curriculum, with a flexible, unit-based structure and knowledge applied in project-based assessments and CPAC focus on the holistic development of the practical, interpersonal and thinking skills required to be able to succeed in employment and higher education. Students use Seneca to review materials taught in lesson Students complete coursework based on work-based scenarios<br>Students develop transferable skills such as communication, presentation and time management through their practical investigations. |

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| **Year 13** | Understanding that chlorophyll absorbs light during photosynthesis and converts carbon dioxide and water into glucose and oxygen underscores the importance of respecting the delicate balance of our ecosystem. By learning about these natural processes, our students develop a deeper appreciation for the intricate interactions that sustain life on Earth.<br><br>Understanding that all new species arise from existing ones, sharing common ancestry, highlights the importance of respecting the interconnectedness of life on Earth. This knowledge fosters a greater appreciation for the diversity of organisms and the evolutionary processes that shape them. | The shared biochemical pathways and genetic material among all living organisms underscore the unity of life. Recognizing that we all share common chemistry, such as the use of the same 20 amino acids in proteins and a universal genetic code, promotes a sense of equality and interconnectedness among diverse species including *Homo sapiens.*<br><br>The fact that both photosynthesis and respiration are shared processes among all living organisms highlights the unity and interconnectedness of life. This knowledge promotes the idea that all species, despite their diversity, are part of a larger community that relies on similar fundamental biological processes for survival.<br><br>Students consider the implication of disease on wider society.<br>Students develop an understanding of how culture and background may impact access to healthcare and acceptance of treatment. | Students consider holistically the impact of disease on a person and how this impacts their well-being and mental health, especially as new treatment methods are developed and tested to improve quality of life.<br><br>The complexity and elegance of evolutionary processes can inspire a sense of wonder and joy. For example, marvelling at how genetic drift and natural selection drive the evolution of species can remind us of the beauty and ingenuity of life, contributing to mental well-being and a positive outlook on the natural world. Admiring at how plants convert sunlight into energy can remind us of the beauty and cleverness of life, providing a mental boost and a sense of connection to the environment. | Understanding the mechanisms of evolution, genetic regulation, and cellular control equips individuals with essential knowledge for careers in fields such as genetics, biotechnology, and medicine. For instance, medical researchers can use this knowledge to develop advanced treatments for diseases, fostering resilience and adaptability in the face of scientific challenges.<br>A thorough understanding of photosynthesis and respiration equips individuals with essential knowledge for careers in fields such as biology, environmental science, and agriculture. For example, agricultural scientists can use this knowledge to develop more efficient ways to grow crops, which is crucial for addressing global food security. This preparation fosters resilience and adaptability in personal life challenges. |


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Health
Careers
Citizenship
Character
PERSONAL DEVELOPMENT
WHAT-HOW-WAY