Science

Newent Community School and Sixth Form Centre

Whole school Curriculum INTENT

Our curriculum aims are underpinned by our values:

Our goal is for Newent Community School and Sixth Form Centre to be a thriving and supportive community underpinned by mutual respect. We strive for excellence by providing a challenging, stimulating, creative and diverse learning environment that enables us all to become the best we can be.

In **Science our INTENT** is to provide a broad and balanced education for all students that's coherently planned and sequenced towards cumulatively sufficient knowledge of skills for future learning and employment by:

- **fostering holistic learners -** We nurture inquisitive minds that reach far beyond the confines of textbooks. By intertwining science with various disciplines, our approach develops well-rounded students prepared to thrive in an interconnected world.
- **inspiring passion and enthusiasm -** We kindle curiosity and empower inquiry. Encouraging students to question, explore, and understand, this transforms science into an exciting journey of discovery, rather than a mere collection of facts.
- **cultivating active engagement -** Through dynamic learning experiences, we foster an environment where students actively connect with ideas, embrace challenges, and grow as innovative thinkers.
- **to deliver high quality science teaching –** ensuring that teachers have a deep knowledge of the topics being taught (and supporting those that are non-specialist), an excellent understanding in the varying abilities of the students that they teach and a variety of pedagogical and metacognitive strategies that are adapted to best support every student so that no student is left behind.

At Newent it is our intention to teach Science in alignment with our core HEART values

Whole School Curriculum IMPLEMENTATION

In Science we enable students to develop knowledge, understand concepts and acquire skills. This enables them to choose and apply these skills in relevant situations by:

- **ensuring a comprehensive spiral curriculum -** The spiral curriculum that builds key scientific knowledge and skills throughout their school life and beyond as determined by the national curriculum and AQA specifications at KS3 and KS4. This further leads into the Edexcel, and OCR B specification at KS5. Through Kerboodle, we provide a cohesive spiral curriculum enriched with video, worksheets, thought-provoking questions, and hands-on experiments for every lesson. This ensures a progressive learning journey where concepts are revisited and deepened over time.
- **empowering transferable skills and mastering experimental and practical expertise -** Every lesson is designed to develop essential transferable skills especially those that are useful across subjects, in their future, particularly literacy, numeracy, oracy. graphicacy, scientific thinking and modelling whether it is through data collection, research, analysis and problem solving. These pillars empower students to think critically, communicate effectively, and apply their knowledge creatively.

We support students' spiritual, moral, social and cultural development by

- **celebrating cultural diversity -** Our curriculum embraces cultural diversity, ensuring lessons resonate with students' unique cultural backgrounds. By making science relatable to their lived experiences, we create connections that deepen understanding and foster inclusion.
- **exploring ethical dimensions of science -** We encourage thoughtful discussions on ethical issues in scientific research, such as cloning, to help students develop critical thinking and moral reasoning.
- **advocating for representation -** Our curriculum highlights trailblazing women in science and celebrates diversity during events like Black History Month. By recognizing the contributions of ethnic minorities, we inspire students and promote equity in the scientific community.
- **addressing global challenges -** We engage students with big-world responsibilities, tackling urgent topics like climate change, fossil fuels, poverty, food security, social responsibility, and global warming. By emphasizing that there is "no planet B," we empower students to become informed and active participants in creating a sustainable future.

We support students' physical development and responsibility for their own health, and enable them to be active by

- **comprehensive sexual education -** We provide inclusive and age-appropriate scientific sex education that empowers students with knowledge about health, relationships, and personal well-being.
- **promoting health and wellness -** Our curriculum addresses vital topics such as health, disease prevention, nutrition, and the changes associated with puberty. Lessons incorporate relevant issues like the importance of hygiene and the benefits of regular exercise, promoting a holistic approach to physical and mental health.
- **understanding chemical and radiological safety -** We educate students on the potential dangers of chemicals found in household products and the risks associated with radioactivity. By fostering awareness, we help students make informed and safe choices in their daily lives.

- **active learning through experimentation -** Hands-on experimentation forms the backbone of our teaching approach, encouraging students to actively engage, hypothesize and explore. This method cultivates critical thinking and a passion for discovery.

We promote a positive attitude towards learning by

- **inspiring awe and wonder -** We cultivate a sense of wonder in students, keeping their minds open to the marvels of science. From the intricacies of ecosystems to the grandeur of cosmic phenomena and the hidden beauty of microscopic worlds, we fuel their passion for discovery and understanding.
- **fostering an open mindset -** Through engaging and inclusive teaching, we encourage students to approach learning with curiosity and openness. This mindset not only drives intellectual growth but also prepares them to embrace diverse perspectives and innovative ideas.
- **building resilience -** Our curriculum strengthens students' resilience by challenging them to overcome obstacles, persevere through complex problems, and adapt to new situations. These experiences empower them to face future challenges with confidence and determination.

We ensure equal access to learning for all students, with high expectations for every pupil and appropriate levels of challenge and support by

- **addressing student factors -** Our teaching strategies are thoughtfully adapted to cater to students' diverse cognitive and affective needs. By recognizing their prior knowledge, unique ideas, and individual experiences, we create an inclusive learning environment. This includes tailored support for SEND (Special Educational Needs and Disabilities) and PP (Pupil Premium) students, ensuring equitable opportunities for success.
- **promoting gender balance in science -** We strive to increase gender balance across all scientific disciplines by fostering enthusiasm and encouragement. With targeted efforts, we aim to inspire more females to pursue physics and more males to explore biology, breaking stereotypes and broadening perspectives.
- **creating limitless curricular opportunities -** Our curriculum is designed to open doors, not close them. The curriculum offers pathways for students to complete either combined or separate sciences, while ensuring A-Level options remain accessible to all students regardless of their pathway. This structure empowers students to pursue their aspirations without limitations.

We have a high academic/vocational/technical ambition for all students by

- **purposeful assessment -** We design assessment tools that effectively measure students' achievements, ensuring alignment with curriculum goals. Our assessments provide

meaningful feedback, guiding both students and educators toward continued growth and success.

- **separate science pathways -** Our curriculum offers distinct separate science options that allow students to deepen their understanding of individual scientific disciplines. This tailored approach supports specialization while maintaining accessibility for all learners.
- **stretch and challenge opportunities -** We create opportunities to stretch and challenge students, encouraging them to exceed expectations, explore advanced concepts, and cultivate higher-level critical thinking skills.
- **encouraging innovation through CREST and science club -** Our CREST and science club provides students with the platform to engage in exciting science, technology, engineering, and mathematics (STEM) projects. This initiative inspires creativity, collaboration, and problem-solving, empowering students to push boundaries and innovate. When not working towards a CRESTS award students have an exciting platform to experiment, innovate, and explore. It nurtures a sense of curiosity and collaboration, enabling students to deepen their passion for science in a fun, engaging environment.

We equip students with the knowledge and cultural capital they need to succeed in life by

- **enhancing science capital beyond the classroom -** We enrich students' science capital by organizing trips and activities outside lessons. These experiences deepen their understanding, broaden their horizons, and connect classroom learning to real-world applications.
- **embedding science capital into every lesson -** Our teaching approach incorporates the principles of science capital across all lessons. By weaving connections to students' lives, cultures, and interests, we inspire relevance and engagement.
- **strengthening links to careers and hobbies -** Every lesson emphasizes the connections between science and future careers, hobbies, and real-world applications. By showcasing the diverse opportunities science offers, we inspire students to envision their potential and possibilities.
- **making real-world connections** - We ensure science lessons are grounded in the real world, helping students relate complex concepts to everyday phenomena and global challenges. This makes learning tangible, impactful, and relatable.

We provide subject choices that support students' learning and progression, and enable them to work towards achieving their goals by

- **flexible pathways: combined and separate science -** Our curriculum is designed to accommodate diverse learning needs and aspirations, offering Combined Science and Separate Science pathways. This flexibility ensures every student can find a route that suits their abilities and ambitions.
- **higher and foundation tiers -** We provide both Higher and Foundation tiers to cater to varying levels of proficiency, allowing students to achieve their potential at a pace that works for them.

- **building metacognitive skills -** Our teaching emphasizes metacognition, helping students understand how they learn and develop strategies to improve their thinking and problem-solving processes. This skill fosters independence and lifelong learning.
- **retrieval -** We begin each lesson using retrieval activities, connecting new concepts to what students already know. This approach strengthens comprehension and sets the stage for deeper learning.
- **integrated assessment -** We adopt an integrated assessment approach that seamlessly aligns with the curriculum, combining formative and summative methods. This strategy ensures a holistic evaluation of students' progress and achievements while providing actionable, meaningful feedback to support their learning journey.

We provide a broad curriculum ensuring all students are able to access the English Baccalaureate by

- **meeting EBacc standards -** Our science curriculum is designed to contribute to students' success within the English Baccalaureate (EBacc) framework. By fostering excellence in scientific disciplines, we ensure that science remains a core pillar of academic achievement and broadens students' future opportunities.

We develop students' independent learning skills and resilience, to equip them for further/higher education and employment by

- **developing essential research skills -** Through hands-on experiments and dynamic projects, students master essential research skills, such as formulating hypotheses, analyzing data, and solving complex problems. These experiences lay a strong foundation for scientific inquiry and critical thinking.
- **cultivating practical expertise -** Our curriculum emphasizes practical skills, allowing students to apply scientific concepts in real-world contexts. This hands-on approach enhances their confidence and prepares them for future academic and professional challenges.
- **integrating the science capital approach -** We embed the science capital framework into every aspect of teaching, connecting science to students' interests, cultures, and future aspirations. This ensures lessons are relatable, engaging, and meaningful.
- **frequent and purposeful assessment -** Regular assessments are seamlessly integrated into the learning process. They provide valuable insights into students' progress and offer constructive feedback to guide their continuous growth and achievement.
- **building metacognitive skills -** By focusing on metacognition, we help students develop self-awareness in their learning processes. They acquire strategies to reflect, evaluate, and optimize their problem-solving approaches, fostering independence and lifelong learning.

KS3

The AQA curriculum in KS3 science is one that supports the GCSE content through a spiral curriculum but also enthuses students to learn more about the world around them. This is done by building fundamental skills in research and practical work, whilst explaining some of the scientific phenomena in school whilst linking it to real world applications to deepen understanding.

KS4

The AQA curriculum in KS4 gives options for students to have more support or learn more through either the combined (trilogy) or separate science pathway. Combined science covers all aspects, including the fundamentals of science and all required practical experiments, whilst the separate science pathway includes extra content which enthuses students who excel in the subject to learn more. Both work schemes run in parallel. This ensures we have a broad curriculum, with content that covers all aspects of the 3 sciences at various levels for students to achieve their best and to allow for the continuation on to KS5.

KS5

In science we have 3 full A level courses, one in Biology (Edexcel), one in Chemistry (OCR B) and one in Physics (Edexcel). All courses complete the CPAC criteria for students to achieve a practical endorsement certification. All courses are taught by experienced teachers with a wealth of knowledge. Students completing these courses move onto university applications or high-level apprentices.

ASSESSMENT

In Science we have an informal mid-topic knowledge check, to give students the opportunity to recover topic knowledge prior to the end of each topic written assessments which assess the students' total understanding of the specific topic material. The end of topic tests then feed into the larger formal end of year exams. Assessment criteria and mark schemes for all assessments are shared with students so that they know what they need to do to improve going forward. Reflection time has been built into each lesson/after an assessment so that students can see where they are with their learning and what next steps they need to put into place to reach their goal.

HOME LEARNING

We support home learning by adding YouTube video links (mainly Cognito) in advance to Satchel one for the topics being studied to ensure that students that are absent can catch up on any work missed and to allow for flipped learning opportunities. The online platform Kerboodle is easy to use and gives access to digital versions of the textbooks for the KS3 and KS4 courses. In combination with BBC bitesize, Seneca (a home learning and assessment platform) and the low stake Neeto Quizes, it gives the opportunity for all students to excel at their subject. Oak Academy is also a powerful tool utilized for those off for longer periods of time, where videos, presentations and worksheets can be accessed in one location for several lessons over a topic.

KS3 and **KS4** homework is set either centrally or by individual class teachers every week and can consist of varying tasks including low stake quizzes, Seneca tasks, recall knowledge tasks, completing glossaries, practice questions, longer exam questions or practicing math and graphical skills

KS5 homework is set by individual class teachers at least once a week. The homework will mainly revolve around research tasks and exam practice questions. A-level students also have access to the individual subject's super curriculum to stretch their wider scientific knowledge further.

HOW PARENTS CARERS CAN ASSIST AT HOME

You can assist at home by ensuring students work independently at home and keep track of assessments using the Satchel one platform. You can further help by ordering a revision guide, checking what students have learnt in lessons by using the resources on Satchel one, checking homework tasks have been completed to a satisfactory standard and helping with revision tasks e.g. testing students' knowledge.