The Science Curriculum at Our Lady's Catholic High School

Through a carefully designed and planned spiral curriculum, pupils develop a breadth and depth of understanding of key scientific theories, practices and skills. Accordingly, they learn about and become increasingly confident in using scientific skills such as investigation, questioning, analysis and experimental techniques. From this they then also gain a number of transferable skills including independent and collaborative working, logical thinking, methodical approach to tasks and concise and accurate communication.

The science department also supports the whole school curriculum in advancing pupils' literacy and numeracy skills by integrating this learning into science lessons. Through our engaging and relevant lessons, pupils come to realise that learning science provides them with the knowledge and skills that opens doors to further education and / or rewarding and interesting careers.

Our curriculum takes cognisance of topics taught at KS2 where, for example, pupils study materials in year 5 followed by living things and electricity in year 6. Year 7 classes begin with a working scientifically module so that all pupils have the skills needed to access future content. These skills are then revisited in the context of the topics being taught. Also, as pupils face a chemistry-heavy GCSE, our curriculum is designed to ensure they cover essential knowledge of chemistry in year 7 to bridge any gaps not addressed at primary school. By having a carefully designed curriculum that provides essential prior knowledge for GCSE, and accurately assessing pupil progress, we can be confident that pupils are ready to access the GCSE specification. A more comprehensive outline of how knowledge and skills are built from KS2 can be found in the 5 year curriculum map.

The science curriculum is planned to ensure the delivery of the KS3 National Curriculum and the KS4 AQA Specification in a 5 year programme of study that follows a conceptually progressive order for all pupils. Our curriculum spirals, building on prior knowledge and skills, revisiting key concept areas from years 7-11. For example, pupils study cell structure in year 7 which is used to understand a cell process called respiration in year 8, which is needed for transport between cells in year 9, which is needed to understand types of respiration in year 10, which is connected to control of blood glucose control in year 11. The planned sequencing of all learning is detailed in the 5 year curriculum map[(1)].

Curriculum vocabulary is very important and is highlighted by teachers on PowerPoints and white boards. Key command words and their meaning are also on display in each science room. Teachers consistently use subject specific language in their verbal and written instructions and they encourage students to do the same. Numeracy is also important in science and therefore pupils are taught relevant and targeted skills at the start of years 7 and 9. It is also more generally integrated into science lessons and all science rooms have displays to support pupils in converting units of measurement.

Our Curriculum is designed to be challenging for all our pupils and we ensure this happens by reducing scaffolding on an individual pupil basis where and when teachers consider it appropriate to do so. Pupils then have the opportunity and are encouraged to make links across topics and disciplines producing their own schemas for the content covered. Across the department, staff use a variety of teaching styles to ensure pupil progress and retention of knowledge. These may include duel-coding, modelling, retrieval practice and other Rosenshine's principles.

SEND pupils are known and taught the same ambitious curriculum as other pupils. The learning is scaffolded, and pupils are supported, without compromising the content or level of challenge. There is plenty of repetition and pupils take small steps towards learning outcomes. We have introduced the Entry Level Certificate (ELC) for some of our pupils which enables them to gain a qualification in science, whilst also having the opportunity of being duel entered for GCSE combined science. This means that all pupils have access to the GCSE science course and the opportunity to be entered for the examinations. Disadvantaged pupils are known by class teachers who monitor their progress and provide timely intervention as necessary.

Staff actively encourage and support these pupils to access resources, extra teaching, and or enrichment activities.

By enriching the curriculum, we enable pupils to connect the science they learn in school with the outside world and with potential careers that require science qualifications. Staff are passionate about getting pupils to experience science beyond the curriculum and as part of this educational visits are offered throughout pupils' time at our school. STEM club runs for year 7, and our Science Week activities provide enrichment opportunities for all year groups. There is also a science section in the weekly school newsletter which includes science related news, podcasts and a quiz. This year we are starting the use of science magazines in lessons and activities encouraging pupils to learn about a diverse range of scientists who have contributed to scientific discovery. These activities also support improvement of literacy and vocabulary for our pupils.

In each topic studied from Y7-11, pupils are taught about a potential career that they would be able to access should they wish to pursue science further in this area. This shows them the relevance of the science they are learning to the wider world and its potential advantage to them in their future lives.

Preston is a multicultural city, and our school population reflects this. As such work is being undertaken to ensure that all our pupils can see themselves reflected in the people that we discuss and study within science. When studying topics that provoke discussions around ethics or religious teachings, for example cloning and contraception, consideration is given to a wide range of views.

A structured assessment programme is followed across the 5 year programme. Through recording and monitoring assessment data we ensure that pupils are making the expected progress and that all pupils are being appropriately challenged to meet their individual targets. Analysis of the data also informs future planning and teaching. Staff give feedback to pupils to encourage them to learn from mistakes made and to develop their knowledge, skills and application of content (See Assessment Policy).

The department led CPD is planned based on the requirements of staff and the drive to improve the delivery of the curriculum across the 5 years. In development times we aim to share best practice though teaching and learning moments and review progress through the curriculum. This year's particular focuses are:

- Teaching and learning for year 8
- Assessment for years 8, 10 and 11.
- Biology subject knowledge and pedagogy
- Health and safety
- Effective pupil feedback

(1) Some minor scheduling changes have been made to the 5 year programme as a result of disruption due to COVID -19.