Nova Hreod Academy
The best in everyone™
Part of United Learning

The Science Curriculum

Year 11

- C10. Using resources — How we use the Earth's resources and impact on the world
- P8. Space — TRIPLE SCIENCE ONLY: How the universe formed and the objects within it
- C9. Atmosphere — How the Earth's atmosphere has changed over time and the consequences of human induced climate change
- B6. Inheritance — How and why organisms reproduce and how evolution occurs
- P7. Magnetism & electromagnetism — How magnets and electromagnets work and their applications in the modern world
- C8. Chemical analysis — How different chemicals can be detected using various tests
- B5. Homeostasis — How the hormonal and nervous systems respond to change
- P6. Waves — How waves transfer energy and information
- C7. Organic chemistry — How the chemistry of carbon compounds impacts our world
- B7. Ecology — How organisms interact with each other and their habitats including human impacts
- C6. Rates — How understanding and controlling the rate and equilibrium of a reaction is important
- P5. Forces — How we represent forces and the effects they have
- C5. Energy changes — How chemical reactions involve energy changes
- B4. Bioenergetics — How the key processes of photosynthesis and respiration permit life on Earth
- P4. Atomic structure — How ionizing radiation occurs and the implications of it
- C4. chemical changes — Understanding chemical changes and using this knowledge to predict reactions and make use of them
- B3. Infection and response — How organisms get sick and what can be done to prevent this
- P3. Particle model of matter — How energy causes changes in particle behaviour
- C3. Quantitative chemistry — How calculations allow us to make reactions as efficient as possible
- B2. Organisation — How organ systems work to keep organisms alive
- C2. Bonding, structure and the properties of matter — How elements behave in different materials and the importance of this in relation to their useful properties
- P2. Electricity — How electrical circuits work
- 8. GCSE P1. Energy — How energy is stored and transferred

Year 10

- 7. GCSE B1. Cell Biology — How cells differ and how multicellular organisms are formed and organised
- 6. GCSE C1. Atomic structure and Periodic Table — Patterns in the periodic table, how substances are either pure or impure and how they can be separated
- 5. Biological Systems and Processes — How many individual organ systems work together to support life
- 4. Sound waves — How sound waves are produced, how they behave and their uses
- 3. Energetics and Rates — How energy is key to chemical reactions
- 2. Reactivity — How the reactivity of different elements affects how they are extracted and how they behave
- 1. Forces in Action — How laws apply to forces and how we can put forces to use
- 7. Matter — How energy is stored in particles and how they behave

Year 9

- 7. Plants and Photosynthesis — How plants are organized and adapted for survival
- 6. Forces and Motion — How interactions between objects cause forces and how forces cause changes. How speed and acceleration are calculated and how motion is represented
- 5. Chemical reactions — How chemicals are represented and how chemical changes occur
- 4. Reproduction and variation — How plants and animals reproduce
- 3. Energy — How energy is stored and transferred
- 2. Cells, tissues & organs — How cells, plants and animals are organized
- 1. Particles — How particles behave in different states of matter
- 1. Light and Space — How light interacts with different objects including the eye and cameras. How the Earth is affected by other objects in space and how the solar system formed
- 2. Periodic table — How atoms, elements and compounds are defined and the history of the periodic table
- 3. Digestion and Nutrition — How the human digestive system works. How our bodies require different foods to remain healthy
- 4. Electricity & magnetism — How charges lead electricity and the usefulness of magnets and electricity together
- 5. Materials and Earth — How the Earth is structured and how rocks are formed
- 6. Plant structure & photosynthesis — How plants are organized and adapted for survival

Launchpad Year 7

Key: Biology content, Chemistry content, Physics content, Working scientifically and careers content

Assessment: common interim assessments are used twice a term at KS3 and at the end of each topic at KS4

The Science Curriculum at Nova is Ambitious, Sequenced Carefully, Principled, Inclusive, Research-informed and Enriching.

AMBITIOUS

Scholars further develop their understanding of and interest in science whilst delving into both the history of scientific discovery and the contemporary implications of scientific findings. For example, what has led us to our current understanding of the atom? Are stem cells really going to help us cure diseases? Scientific discoveries have expanded our knowledge and understanding of the world around us faster than any other discipline but there is still more to be discovered. The science curriculum at Nova Hreod Academy will develop curious and enthusiastic scholars that will become the scientists of tomorrow, making the most important discoveries of the future and driving our understanding ever onwards.

SEQUENCED

The curriculum is carefully sequenced allowing us to build from fundamental principles such as what particles are and how they behave, how a cell works, energy and motion to more complex ideas such as the structures and bonding in all kinds of chemicals, genetics and inheritance and how forces act. In KS4, scholars choose either to follow the combined science or separate science route. By the end of their time studying science scholars will be confident in their understanding of the scientific explanations of the things around them and eager to find out even more. They will be well prepared for life after Nova and A-level sciences or related subjects in other Post-16 routes if they so chose.

PRINCIPLED

Our priority is building a strong knowledge foundation for the scholars. Clear links are made between topics to encourage scholars to build the bigger picture of science. From this starting point they learn to question and debate ideas at the forefront of science as well as appreciate the importance of the history of science in shaping the world today. Practical investigation and scientific methodology play an important role in our teaching, equipping scholars with critical thinking, problem solving and analytical skills that go beyond the science classroom.

INCLUSIVE

We never assume knowledge and new topics and lessons are always started with a recap of prior knowledge to ensure all scholars are able to engage with the content. Potential misconceptions are identified at the planning stage so that teachers are able to work with the scholars to improve their understanding on these key issues. Duel coding is used in lessons along with I do, we do, you do cycles so that all scholars can feel success in their learning. Scientific texts are read as a whole class and understanding checked whilst key vocabulary is taught and practiced before being put into use.

RESEARCH INFORMED

The interleaving of topics throughout our curriculum is key in strengthening scholars' understanding of science and how it all links together. Home study is carefully planned to support in class learning and knowledge retention in conjunction with regular low stakes quizzing. I do, we do, you do cycles are used throughout our lessons to ensure scholars know what success looks like and are able to achieve it for themselves. Techniques such as cold calling, show call and turn & talk are standard in lessons to promote scholar engagement. Common interim assessments are used regularly in conjunction with data driven instruction and whole class feedback provided so that scholars progress and improve.

ENRICHING

As part of our co-curricular offer scholars can attend science after school clubs and are also given the opportunity to take part in at least one science trip every year. Attending events such as the Cheltenham Science Festival and the Big Bang Fair encourages scholars to consider science in a wider context and strengthens their everyday science learning. Year 10 scholars are also given the opportunity to attend Science Live, a series of lectures by UK scientists which also includes advice on their GCSE exams. As much as possible we also run workshop sessions in school with the help of outside agencies to give scholars a broader experience of science.