



**KS4 CURRICULUM
KNOWLEDGE AND SKILLS
SUBJECT REFERENCE GUIDE
Year 11**

GCSE ART AND DESIGN

Students will develop their **KNOWLEDGE** of:

- how to **research** effectively – the ability to explore the work of a range of artists, designers and craftspeople and draw inspiration from this
- how to **explore ideas** using the work of artists, craftspeople and designers, (including photographers and architects) to develop and extend thinking, and to help them make informed decisions with their own work
- how ideas, feelings and meanings can be conveyed and interpreted in images, artefacts and products
- how images, artefacts and products relate to social, historical, vocational and cultural contexts
- a variety of approaches, methods and intentions of contemporary and historical **artists, craftspeople and designers** from different cultures and their contribution to continuity and change in society
- how to work **autonomously** within their own chosen themes, using ideas and selecting artists and techniques appropriately and suitable to their developments.
- how to be **creative!**

Students will develop their **SKILLS** in:

- **recording** experiences and ideas in appropriate forms (such as drawing, painting, mixed media, photography, textiles, 3D design and printmaking).
- **exploring** relevant resources – analysing, discussing and evaluating images, objects and products, making and recording independent judgements in visual and other forms.
- exploring potential lines of enquiry using appropriate media practices and techniques such as **drawing, ceramics, painting, printmaking, photography, textiles, 3D design, laser cutting, Photoshop, Illustrator and other IT software.**
- **making** images, artefacts and products; reviewing and modifying work and planning and developing ideas in the light of their evaluations
- **communicating ideas**, and presenting them in a range of appropriate visual, tactile and/or sensory forms including the use of new technologies
- working both as individuals and in collaboration with others in a range of situations
- **discussing** the work of relevant artists linked to their own intentions
- using correct Art terminology when annotating and evaluating their own work in relation to their intentions
- being **creative!**

GCSE COMPUTER SCIENCE

Students will develop their **KNOWLEDGE** of:

- how data is input, processed and output and how it can be stored
- computing hardware including the CPU, Memory and Binary logic
- computing software including Operating Systems, Utility programs and the merits of custom written and open source software
- different forms of data representation for numbers, characters, images and sound
- different Database concepts such as DBMS and Relational Databases
- computer communications through networks and the internet
- programming concepts including algorithms, control flow in imperative languages and testing
- searching and sorting algorithms

Students will develop their **SKILLS** in:

- planning and carrying out a practical investigation, creating efficient solutions to problems
- selecting suitable techniques to solve all aspects of a problem
- producing reports that effectively demonstrate an understanding of technical terminology/ concepts
- critically appraising evidence presented
- programming techniques including basic programming constructs, loops, basic string manipulation and use of arrays
- using various software applications
- working collaboratively
- identifying potential risks when using ICT and then developing safe working practices to overcome these risks

GCSE DESIGN AND TECHNOLOGY

Students will develop their **KNOWLEDGE** of:

- new and emerging technologies, the use and generation of energy, the function and application of electrical and mechanical systems.
- the categorization of the types, properties and uses of materials such as papers and boards, timbers, polymers and textiles.
- the environmental, social and economic challenges facing designers.
- investigating effectively – drawing inspiration from the work of past and current designers and companies, researching existing products and identifying user needs.
- designing for specific users in response to specific problems and contexts.

This Award complements the learning in other Level 2 programmes such as BTEC Tech Award in Engineering by broadening the application of design and make tasks, working with a design brief, testing and evaluation.

Students will develop their **SKILLS** in:

- using modern and traditional tools, equipment and techniques to make manufacturing decisions and carry them out independently and accurately when making a prototype or product.
- applying safe working practices and communicating understanding verbally, visually and in writing.
- literacy, numeracy and ICT including specific design software.
- independent working; working to deadlines; efficient use of resources; using materials and techniques independently and with precision.
- Specialist techniques and processes which incorporate the use of computer aided design and manufacture.

GCSE DRAMA

Students will develop their **KNOWLEDGE** of:

- **creative expression:** group work, leadership/directing, active listening, devising, collaboration, reflection and refining ideas, audience awareness
- **verbal contribution:** verbal evaluation and analysis of textual themes, verbal discussion and analysis of live theatre
- **theatrical style and genre:** any theatrical style or genre found within pre-2000 plays, script work
- **written communication:** understanding examination requirements and structure, communicating of creative performance and design and ideas

Students will develop their **SKILLS** in:

- **characterisation:** movement (gesture, posture, facial expression, body language, gait, stance, dynamics, levels, proxemics, stage positioning) voice (tone, pitch, pace, pause, volume, articulation, accent), development techniques (improvisation, devising from a stimulus), character relationships and audience rapport
- **utilising conventions for a purpose:** still image, marking the moment, split focus, physical theatre, mime, flash-forward/ back, slow motion, robotic movement, unison / choral movement and speech, thought tracking, narration, episodic structure, symbolism, climax, contrast
- **oracy and communication:** presence, clarity, eye contact, presentation
- **written communication:** grammar and punctuation, expression of creative ideas using subject specific terminology, analytical and evaluative writing to enhance persuasive argument

BTEC LEVEL 1 / LEVEL 2 TECH AWARD IN ENGINEERING

The Award gives learners the opportunity to develop sector-specific knowledge and skills in a practical learning environment. The main focus is on four areas of equal importance, which cover the:

- development of key engineering practical and technical skills, such as research, observation, measurement, making, using computer-aided design (CAD) and disassembly
- knowledge of key engineering sectors (mechanical, electrical, chemical, communication, aerospace, automotive and engineering design) and the interrelation of each in industry
- knowledge of the stages involved in planning and implementing an engineering project
- knowledge and skills involved in the investigation of solutions to engineering problems in response to a given brief

This Award complements the learning in other GCSE programmes such as GCSE Design and Technology by broadening the application of design and make tasks, working with an engineering brief, testing and evaluation.

Students will develop their **KNOWLEDGE** of:

- the various engineering sectors and the role of design in the production of engineered products
- engineering sectors, products and organisations, and how they interrelate
- engineering skills through the design process using drawing skills and ICT
- health and safety rules and considerations of workshop safety
- quality control and quality assurance working within tolerances
- key engineering processes used to manufacture modern products, in a range of engineering sectors
- how engineering materials and technology develops

how engineering contributes to a sustainable future

- analysing existing products to determine their performance requirements
- a selection of specific materials and components

Students will develop their **SKILLS** in:

- using knowledge of tools, equipment and techniques to make manufacturing decisions and carry them out independently and accurately
- applying safe working practices and communicating understanding verbally and in writing
- literacy, numeracy and ICT including specific design software
- independent working; working to deadlines; efficient use of resources
- using materials and techniques independently and with precision
- planning work in stages; recording costs, materials, machinery, time limits and quality control

GCSE ENGLISH LANGUAGE

Students will develop their **KNOWLEDGE** of:

Reading -

- a range of texts to help students articulate their ideas in a sophisticated way
- the way in which language, structure, form and context are used to enable a writer to express their ideas
- the significant impact that literature has on the world

Writing -

- the methods used to write with engagement and control
- the ways in which specific audiences can be targeted through linguistic devices.

Speaking and Listening -

- the various ways in which talk and discussion can be used to articulate meaning

Students will develop their **SKILLS** in:

Reading –

- articulating informed interpretations of meanings supported by well-chosen textual reference
- analysing how writers use language and structure to convey ideas, achieve effects and influence readers using relevant subject terminology
- comparing ideas, attitudes, methods and contexts in order to evaluate effectiveness
- relating different texts to their relevant social, historical and literary context across the 19th, 20th and 21st century
- making links between texts
- accessing unseen literature independently
- evaluating texts critically and supporting this with appropriate textual references

Writing -

- communicating clearly, effectively and imaginatively
- selecting and adapting tone, style and register for different forms, purposes and audiences
- organising information and ideas, using structural and grammatical features to support coherence and cohesion of texts
- selecting appropriate words and phrases from a rich and wide vocabulary
- demonstrating control of spelling, punctuation and grammar
- utilising a variety of sentence structures with control for both meaning and effect

Speaking and Listening -

- expressing ideas, feelings and information in a confident and controlled way
- talking in purposeful and imaginative ways to explore ideas and feelings
- ordering and structuring talk in an engaging way
- presenting in a formal way to a range of audiences to achieve a clear purpose

GCSE ENGLISH LITERATURE

Students will develop their **KNOWLEDGE** of:

Reading -

- a range of texts to help students articulate their ideas in a sophisticated way
- the way in which language, structure, form and context are used to enable a writer to express their ideas
- the significant impact that literature has on the world

Writing -

- the methods used to write with engagement and control

Students will develop their **SKILLS** in:

Reading –

- articulating informed interpretations of meanings supported by well-chosen textual reference
- analysing how writers use methods to convey ideas, achieve effects and influence the reader or audience, including language, structure, form and dramatic devices
- comparing ideas, attitudes, methods and contexts in order to evaluate effectiveness
- making specific links between texts and their relevant social, historical and literary context across the 19th, 20th and 21st century
- comparing unseen texts
- exploring the writer's purpose, ideas and perspectives

Writing –

- demonstrating control of spelling, punctuation and grammar when articulating ideas

GCSE FOOD PREPARATION AND NUTRITION

Students will develop their **KNOWLEDGE** of:

- food provenance
- major food commodities groups
- how a commodity is grown, reared and produced
- food preparation, cooking and presentation
- nutritional values (sources, functions, deficiencies, excess, daily requirements)
- dietary considerations for special groups
- food science
- food hygiene, health and safety (QA/ QC)
- sensory properties of food
- use of specialist equipment
- specialist language and culinary terms
- food storage and packaging

Students will develop their **SKILLS** in:

- accurate food preparation with the emphasis on high level skills (20 in total)
- selecting and planning practical tasks in detail
- understanding the physical function of food commodities and applying the knowledge
- evaluating practical and scientific tasks in detail
- conducting a food science experiment and writing a hypothesis
- researching a topic independently

GCSE GEOGRAPHY

Students will develop their **KNOWLEDGE** of:

- Physical and human fieldwork
 - Data collection methods
 - Data presentation techniques
- Physical landscapes in the UK: Coasts
 - UK's diverse landscapes
 - Coastal processes and landforms
 - Coastal erosion and management
- The challenge of natural hazards
 - Physical processes leading to earthquakes and volcanic eruptions
 - How the effects of, and responses to, a tectonic hazard vary between contrasting levels of wealth
 - Management of tectonic hazards
 - Global atmospheric circulation system and its impacts on weather and climate
 - Weather hazards including tropical storms and heatwaves
 - Causes of climate change and strategies to manage climate change
- The challenge of resource management
 - Importance of food, water and energy for human development
 - Changing demand and provision of resources in the UK
 - Increasing demand for food and strategies to manage food supplies

Students will develop their:

- critical thinking and problem-solving skills
- ability to thinking synoptically about a range of issues
- fieldwork skills including data collection methods, data presentation, data analysis and evaluation
- cartographic skills
 - Atlas maps
 - Ordnance Survey maps
 - Maps in association with photographs
- graphical skills
- numerical skills
- statistical skills

GCSE HISTORY

Students will develop their **KNOWLEDGE** of:

Germany, 1890–1945: Democracy and dictatorship

- Germany and the growth of democracy
- Germany and the Depression
- The experiences of Germans under the Nazis

Conflict and tension: The inter-war years, 1918-1939

- Peacemaking
- The League of Nations and international peace
- The origins and outbreak of the Second World War

Britain: Migration, empires and the people:c790 to the present day

- Conquered and conquerors
- Looking West
- Expansion and empire
- Britain in the 20th century

Elizabethan England, c1568–1603

- Elizabeth's court and Parliament
- Life in Elizabethan times
- Troubles at home and abroad
- The historic environment of Elizabethan England

Students will develop their **SKILLS** in:

- explaining and analysing historical events and periods studied using second order historical concepts including continuity, change, cause, consequence, significance, similarity and difference
- analysing, evaluating and using sources (contemporary to the period) to make substantiated judgements, in the context of historical events studied
- analysing, evaluating and making substantiated judgements about interpretations (including how and why interpretations may differ) in the context of historical events studies
- developing as independent learners and as critical and reflective thinkers
- developing the ability to ask relevant questions about the past, to investigate issues critically and to make valid historical claims by using a range of sources in their historical context
- developing an awareness of why people, events and developments have been accorded historical significance and how and why different interpretations have been constructed about them
- organising and communicate their historical knowledge and understanding in different ways and reach substantiated conclusions

GCSE MATHS

Students will develop their **KNOWLEDGE** of:

- accurately recall facts, terminology and definitions
- using and interpreting notation correctly
- accurately carry out routine procedures or set tasks requiring multi-step solutions
- making deductions, inferences and draw conclusions from mathematical information
- constructing chains of reasoning to achieve a given result
- translating problems in mathematical or non-mathematical contexts into a process or a series of mathematical processes
- making and use connections between different parts of mathematics

Students will develop their **SKILLS** in:

- interpreting and communicate information accurately
- presenting arguments and proofs
- assessing the validity of an argument and critically evaluate a given way of presenting information
- interpreting results in the context of a given problem
- evaluating methods used and results obtained
- evaluating solutions to identify how they may have been affected by assumptions made

GCSE MEDIA

Students will develop their **KNOWLEDGE** of:

- media language and media specific terminology applicable to both general areas of media as well as the media industries studied as part of their course
- media organisations and the structures within the media industry
- how audiences are defined and how various media texts target different audiences
- various genres in media and how they can be defined by generic conventions
- a range of media products

Students will develop their **SKILLS** in:

- applying media language and media specific terminology into their writing of controlled assessments and exams
- responding to a variety of media texts in an analytical way
- various digital media packages in order to edit their own practical media productions
- researching into relevant media texts (set texts and unseen) using different research methods and techniques
- using a range of digital equipment

BTEC LEVEL 1 / LEVEL 2 FIRST AWARD IN CREATIVE DIGITAL MEDIA PRODUCTION

Students will develop their **KNOWLEDGE** of:

- media language and media specific terminology applicable to both general areas of media as well as the media industries studied as part of their course
- media organisations and the structures within the media industry
- how audiences are defined and how various media texts target different audiences
- various genres in Media and how they can be defined by generic conventions
- researching into relevant media texts using different research methods and techniques

Using a range of digital equipment Students will develop their **SKILLS** in:

- applying media language and media specific terminology into their writing of controlled assessments and examined assessments.
- responding to a variety of media texts in an analytical way
- various digital media packages in order to edit their own media practical productions
- working to deadlines

Y11 MFL – GCSE FRENCH, GERMAN AND SPANISH

Students will develop their **KNOWLEDGE** of:

- how to review and improve on basic grammar and vocabulary from previous years as appropriate to ensure progress
- use a wide range of regular and irregular verb forms
- use verb forms in past, present and future tenses without prompting
- use time markers to express different time frames
- use adjective agreement confidently in different contexts
- use a wide range of topic specific vocabulary from the GCSE specification to express ideas in creative ways
- manipulate grammar to express more complex ideas

Students will develop their **SKILLS** in:

- systematically checking and redrafting their work to improve accuracy
- identifying learning needs from tests and GCSE style assessments (study skills)
- practising challenging spellings and key expressions / verbs to improve accuracy in writing
- holding longer conversations and reacting spontaneously to questioning
- developing their ideas and points of view using a wide range of structures
- translating texts using their understanding of both the target language and English to convey meaning accurately
- independently using a dictionary to deepen vocabulary and as reference material
- reading and understanding texts of varying length to understand both gist and detail.
- listening to and understanding speech of varying speed and length to understand both gist and detail

GCSE MUSIC

Students will develop their **KNOWLEDGE** of:

The Elements of Music

- Melody
- Harmony
- Tonality
- Structure
- Sonority (Timbre)
- Texture
- Tempo, metre and rhythm
- Dynamics and articulation

Musical Genres (Developing understanding of the musical features within a variety of musical genres. Exploring the contexts, origins and traditions of different musical styles)

- Western Classical Tradition 1650-1910
 - Popular Music
 - Traditional Music
 - Western Classical Tradition since 1910
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- **Musical Vocabulary** (Knowledge of musical terms, including Italian terms and ability to apply them correctly to various musical tasks)
 - **Musical Symbols** (Such as notes on a staff, treble clef, staff, time signatures, accidentals)
 - **Notes of the Keyboard** (Able to know the notes without support)
 - **Treble Clef Notation** (Have a good understanding of treble clef notation for use in practical tasks)
 - **Rhythmical Musical Symbols** (Crotchets, Minims, quavers, equivalent rests etc.)

Students will develop their **SKILLS** in:

Performing Music

- singing with expression, clear diction, fluency and accuracy – both solo and in a group
- demonstrating high level of confidence in performance
- maintaining an appropriate role within a group (leading, solo part or support)

- showing awareness of the needs of others in group tasks
- ability to coordinate your part with the other performer(s), considering timing
- performing fluently and accurately on the keyboard and tuned percussion
- performing longer parts from memory and/or from music notations
- show an understanding of chords & melodies
- perform on an instrument (or voice) with reasonable technical skill and expression, using tempo, timbre, dynamics and phrasing

Composing Music

- improvising melodic/rhythmic material within extended structures using tempo and dynamics creatively
- sustaining and developing musical ideas
- making significant contributions to a group
- composing music for different genres which explore musical features and devices
- using rehearsal time effectively to refine material
- use relevant notations to plan and revise material
- explore contrasts by exploiting the musical elements
- create coherent compositions, contributing developed ideas to individual and group tasks
- adapt, improvise, develop, extend and discard musical ideas within chosen musical styles

Understanding Music

- identifying different genres of music and their features within listening tasks
- analyse music in more detail, using key words and musical terms
- evaluating how venue, occasion and purpose affect the way music is created performed and heard
- exploring the contexts, origins and traditions of different musical styles
- describing and comparing musical features in listening tasks, using appropriate vocabulary
- recognising a variety of different instrument sounds, knowing the instrument families (and the specific instruments)
- knowing the musical elements and be able to describe how they have been used in listening tasks
- have a good understanding of treble clef notation
- considering successful/non-successful outcomes and improve their own and others' work
- using appropriate musical vocabulary when creating or evaluating work
- write accurate descriptions, using technical vocabulary to give detailed answers
 - evaluating and making critical judgements about the use of musical conventions and other characteristics

CORE PE

Students will develop their **KNOWLEDGE** of:

- advanced strategies, tactics and skills used in sports and physical activities
- rules and regulations for a range of sports
- short term effects of exercise on the body to muscular, cardiovascular and respiratory systems
- antagonist muscle movement in sport specific skills for all antagonistic pairs
- components of fitness explaining how they benefit different sports/activities
- choreographed dances with advanced ideas
- safety factors during physical activity and for more advanced activities
- the benefits of leading a healthy active lifestyle – through exercise and physical activity outside of school

Students will develop their **SKILLS** in:

- racquet/striking and fielding/invasion games/athletics/dance/health related exercise
- team work
- using advanced techniques, strategies and tactics in a range of sports in competitive game situations
- being able to make the correct decisions in competitive situations to allow you to beat an opponent regularly and apply knowledge to different contexts/activities
- contemporary and traditional dance styles and techniques, developing choreography and using the four dance key themes effectively in your work
- analysing performance of yourself and others during performance to alter the outcome of a game

GCSE PE

Students will develop their **KNOWLEDGE** of:

- health and wellbeing
- diet and nutrition
- skill classification
- target setting
- feedback and guidance
- socio-cultural influences in sport

Students will develop their **SKILLS** in:

- demonstrating their ability to select and apply appropriate skills, techniques and ideas in a variety of activities
- being able to offer a wide range of solutions to challenges set and make effective decisions about their performance
- analysing and evaluating their own performance, identifying strengths and weaknesses
- having an understanding of the impact of skills, tactics or composition and fitness on the quality and effectiveness of performance
- applying skills, strategies and tactics in a performance environment effectively
- answering short and extended answer questions on all topics covered

BTEC LEVEL 1 / LEVEL 2 FIRST AWARD IN SPORT

Students will develop their **KNOWLEDGE** of:

- the skills, qualities and attributes associated with successful sports leadership
- how to successfully plan and differentiate a sports activity
- how to review, evaluate and implement changes for future sessions
- rules, regulations and scoring systems for selected sports
- roles and responsibilities of match officials within those selected sports.

Students will develop their **SKILLS** in:

- the planning and delivery of a successful sports activity
- the skills, qualities and attributes required to produce a successful sport session
- demonstrating practically the skills, techniques and tactics needed in their selected sports
- applying sport specific skills to produce effective outcomes within competitive situations
- being able to review sports performance, using ICT to develop feedback methods

GCSE PHOTOGRAPHY

Students will develop their **KNOWLEDGE** of:

- researching effectively – the ability to explore the work of a range of artists and photographers and draw inspiration from techniques, processes and conceptual ideas
- exploring and communicating ideas using the work of others to develop and extend thinking, and to help them make informed decisions with their own work
- having the ability to discuss and compare the work of others, a range of techniques such as lighting, aperture and shutter speeds and making informed decisions about when to apply appropriate techniques
- how ideas, feelings and meanings can be conveyed and interpreted through imagery
- how images, artefacts and products relate to social, historical, vocational and cultural contexts
- a variety of approaches, methods and intentions of contemporary and historical artists, craftspeople and designers from different cultures and their contribution to continuity and change in society
- the possibilities of working with Adobe Photoshop

Students will develop their **SKILLS** in:

- recording experiences and ideas in appropriate forms when undertaking research and gathering, selecting and organising visual, tactile and/or sensory materials and other relevant information
- exploring relevant resources – analysing, discussing and evaluating images, objects and products, making and recording independent judgements in visual and other forms
- generating and exploring potential lines of enquiry using appropriate new media practices and techniques
- applying knowledge and understanding when reviewing and modifying work
- planning and developing ideas in the light of their own and others' evaluations
- organising, selecting and communicating ideas, solutions and responses, and presenting them in a range of appropriate visual, tactile and/or sensory forms including the use of new technologies
- working both as individuals and in collaboration with others in a range of situations
- discussing the work of relevant artists and photographers, using correct Art vocabulary
- ensuring health and safety procedures are adhered to at all times to ensure safety of themselves and their peers.
- choosing materials for particular uses based on their properties, environmental impact and cost.

GCSE PHILOSOPHY AND RELIGION

Students will develop their **KNOWLEDGE** of:

Philosophical questions and themes:

- relationships and families
- religion and life
- Human Rights and Social Justice
- Religion, Crime and Punishment

Students will develop their **SKILLS** of:

- philosophical and religious thinking and how it influences people's lives
- an awareness of differing viewpoints
- appraising and appreciating a variety of beliefs and world-views
- deep thinking skills in connection to ultimate questions
- listening to others and respectfully disagreeing
- using evidence from various sources, including religious scripture, to express and evaluate ideas
- enquiry
- analysing different ideas and viewpoints and being willing to justify your point of view
- debating
- spelling, punctuation and grammar
- empathy
- comparison and identifying links between beliefs and points of view
- putting religious and non-religious scripture into context to draw meaning and conclusions
- research and interpretation
- retrieval

RS: CORE

Students will develop their **KNOWLEDGE** of:

- Privilege (Race, Gender, Sexuality)
- Ethical Dilemmas and Religious Responses
- Abortion
- Capital Punishment
- Euthanasia
- Racism, Prejudice and Discrimination
- Core attitudes and behaviours including resilience and empathy

Students will develop their **SKILLS** of:

- maturity, compassion and tolerance towards real world issues
- ethical, philosophical and religious thinking and how it influences people's lives
- an awareness of differing viewpoints
- appraising and appreciating a variety of beliefs and worldviews
- deep thinking skills in connection to ultimate questions
- listening to others and respectfully disagreeing
- using evidence from various sources, including religious scripture, to express and evaluate ideas
- enquiry
- analysing different ideas and viewpoints and being willing to justify your point of view
- debating
- spelling, punctuation and grammar
- empathy
- comparison and identifying links between differing points of view

GCSE SCIENCE

Students will develop their **KNOWLEDGE** of:

Biology

- the important role of microorganisms in the continuous cycling of chemicals in ecosystems
- how living organisms form populations of single species, communities of many species and are part of ecosystems
- the interdependence of living organisms
- how inheritance relies on the genetic information contained in the genome being passed from one generation to the next, whether sexually or asexually
- the process of evolution through natural selection
- the roles of key individuals in the development of the understanding of genetics
- how living organisms interact with each other, the environment and with humans in many different ways
- monitoring our environment by collecting and interpreting information about the natural world, to identify patterns and relate possible cause and effect
- the rapid increase in the human population and its effects
- diseases affecting the health of populations of both humans and plants
- ways to prevent and combat disease
- how disease is spread, how our bodies defend themselves against disease and how immunity is achieved, is essential to enable us to combat potentially fatal diseases spreading throughout whole populations
- the impact of non-communicable diseases on the health of the population

Chemistry

- models of how substances react and the different types of chemical reactions that can occur enable us to predict the likelihood and outcome of a chemical reaction (Separates only)
- the current Periodic Table and the way it reveals the trends and patterns in the behaviour of the elements (Separates only)
- models of how substances react and the different types of chemical reactions that can occur enable us to predict the likelihood and outcome of a chemical reaction
- the current Periodic Table and the way it reveals the trends and patterns in the behaviour of the elements
the tests that can be used to identify the products of reactions by looking at their physical and chemical properties (Separates only)
- the relationship of moles to the concentration of a solution and the volume of a gas (Separates only)

- how the rate and yield of a chemical reaction can be altered by changing the physical conditions
- when the rate of the forward reaction equals the rate of the backwards reaction, the reaction in a closed system is said to be in equilibrium
- how the commercially used conditions for an industrial process are related to the availability and cost of raw materials and energy supplies, control of equilibrium position and rate (Separates only)
- how our understanding of the structure of materials and chemical processes has improved, and how we are increasing our ability to manipulate and design new materials
- the extraction of raw materials and their use in making new products (Separates only)
- Organic chemistry that is based on carbon and is the basis of life on Earth (Separates only)
- how our understanding of the structure of materials and chemical processes has improved and how we are increasing our ability to interpret and understand chemical and earth systems

Physics

- how waves are means of transferring energy and the two main types of wave
- waves in the electromagnetic spectrum and their applications
- the behaviour of light as rays and waves (Separates only)
- radioactive decay, isotopes and the different types of emissions from atoms.
- how energy can be stored and transferred
- the hazards and applications of radioactive decay
- the processes of fission and fusion as a source of energy (Separates only)
- the idea of conservation and dissipation of energy in systems and how this leads to efficiency
- ways of reducing unwanted energy transfers and thereby increasing efficiency
- how applications of physics can be used to help humans improve their own lives and strive to create a sustainable world for future generations
- the production of electricity.
- the use of non-renewable and renewable resources and the problems that are faced in the efficient transportation of electricity to homes and businesses
- safe use of electricity in the home
- the Big Bang theory and the evidence that supports it as a scientific theory
- the characteristics of planets and the life cycle of stars
- factors that affect natural and artificial satellites (Separates only)
- radiation emitted from stars and black body radiation (Separates only)

Students will develop their **SKILLS** in:

- hypothesising and testing theories and concepts

- assessing hazards and taking precautions to minimise the associated risks
- using appropriate apparatus and techniques
- observation, enquiry and problem solving
- analysing methodology, evidence and conclusions
- interpreting and evaluating
- communication, mathematics and the use of technology in scientific contexts