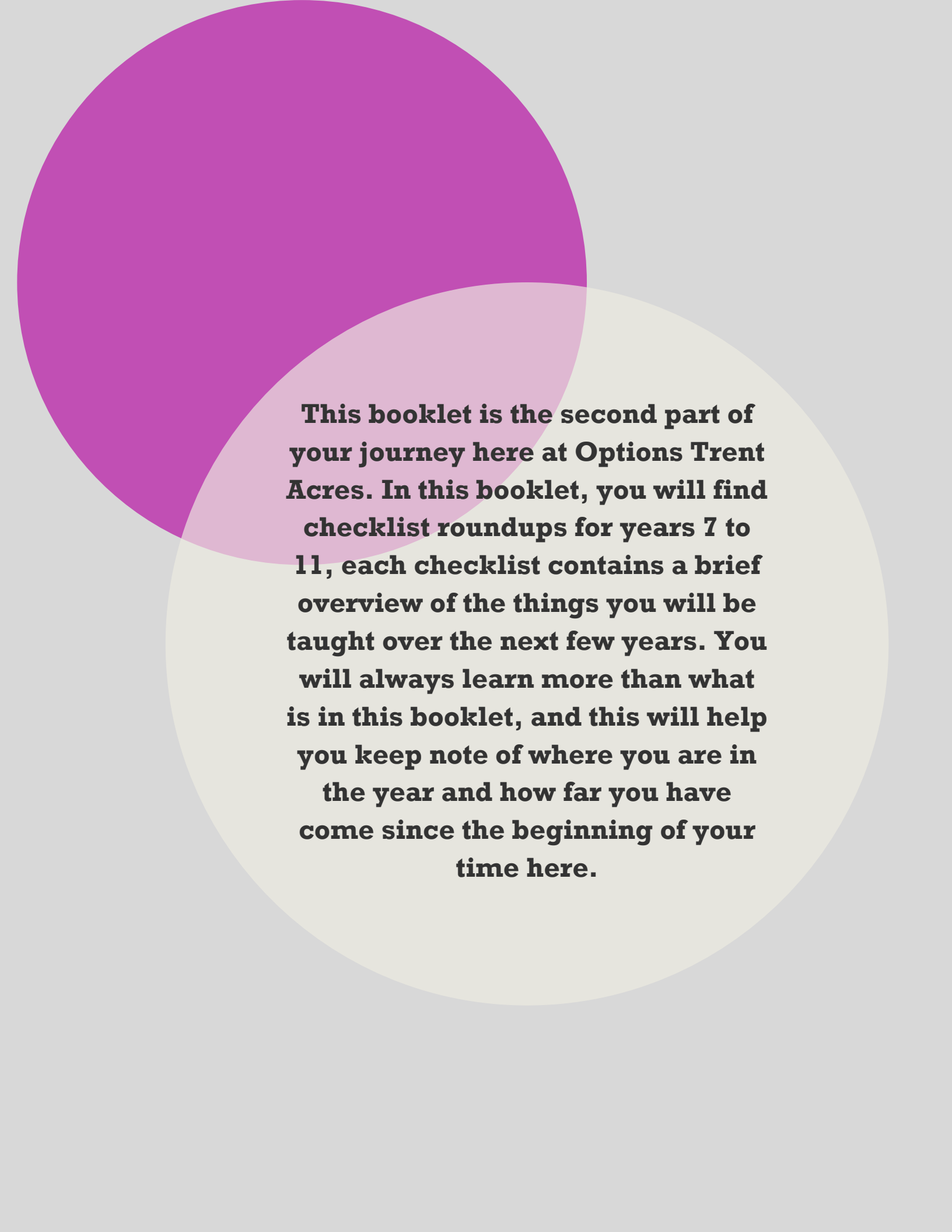


**KS3 TO KS4
CURRICULUM
OVERVIEW**



THIS BELONGS TO



This booklet is the second part of your journey here at Options Trent Acres. In this booklet, you will find checklist roundups for years 7 to 11, each checklist contains a brief overview of the things you will be taught over the next few years. You will always learn more than what is in this booklet, and this will help you keep note of where you are in the year and how far you have come since the beginning of your time here.

WHATS IN HERE?

In the first section of this booklet you will find years 7, 8 and 9. The second half will consist of years 10 and 11. The checklists are presented in key stages, so they show what you will be learning through those years.



WELCOME TO
KS3
YEARS 7-9

ENGLISH

| <u>Reading</u> | |
|--|--|
| <p>Develop an appreciation and love of reading, and read increasingly challenging material independently through:</p> <p>Reading a wide range of fiction and non-fiction, including in particular whole books, short stories, poems and plays with a wide coverage of genres, historical periods, forms and authors. The range will include high-quality works from: English literature, both pre-1914 and contemporary, including prose, poetry and drama, Shakespeare (two plays) Seminal world literature</p> <ul style="list-style-type: none"> • Choosing and reading books independently for challenge, interest and enjoyment • Re-reading books encountered earlier to increase familiarity with them and provide a basis for making comparisons • Understand increasingly challenging texts through: • Learning new vocabulary, relating it explicitly to known vocabulary and understanding it with the help of context and dictionaries. • Making inferences and referring to evidence in the text • Knowing the purpose, audience for and context of the writing and drawing on this knowledge to support comprehension • Checking their understanding to make sure that what they have read makes sense • Read critically through: • Knowing how language, including figurative language, vocabulary choice, grammar, text structure and organisational features, presents meaning • Recognising a range of poetic conventions and understanding how these have been used • Studying setting, plot, and characterisation, and the effects of these • Understanding how the work of dramatists is communicated effectively through performance and how alternative staging allows for different interpretations of a play • Making critical comparisons across texts • Studying a range of authors, including at least two authors in depth each year. | |
| <u>Speaking</u> | |
| <p>Speak confidently and effectively, including through:</p> <ul style="list-style-type: none"> • Using Standard English confidently in a range of formal and informal contexts, including classroom discussion • Giving short speeches and presentations, expressing their own ideas and keeping to the point • Participating in formal debates and structured discussions, summarising and/or building on what has been said Improvising, rehearsing and performing play scripts and poetry in order to generate language and discuss language use and meaning. | |

ENGLISH

| | |
|---|--|
| <u>Writing</u> | |
| <p>Write accurately, fluently, effectively and at length for pleasure and information through:</p> <ul style="list-style-type: none"> • Writing for a wide range of purposes and audiences, including: Well-structured formal expository and narrative essays stories, scripts, poetry and other imaginative writing notes and polished scripts for talks and presentations • A range of other narrative and non-narrative texts, including arguments, and personal and formal letters • Summarising and organising material, and supporting ideas and arguments with any necessary factual detail • Applying their growing knowledge of vocabulary, grammar and text structure to their writing and selecting the appropriate form • Drawing on knowledge of literary and rhetorical devices from their reading and listening to enhance the impact of their writing <p>Plan, draft, edit and proof-read through:</p> <ul style="list-style-type: none"> • Considering how their writing reflects the audiences and purposes for which it was intended • Amending the vocabulary, grammar and structure of their writing to improve its coherence and overall effectiveness • Paying attention to accurate grammar, punctuation and spelling (applying the spelling patterns and rules set out in English Appendix 1 to the key stage 1 and 2 programmes of study for English) | |
| <u>Vocabulary and grammar</u> | |
| <p>Grammar and vocabulary Pupils should be taught to Consolidate and build on their knowledge of grammar and vocabulary through:</p> <ul style="list-style-type: none"> • Extending and applying the grammatical knowledge set out in English Appendix 2 to the key stage 1 and 2 programmes of study to analyse more challenging texts • Studying the effectiveness and impact of the grammatical features of the texts they read • Drawing on new vocabulary and grammatical constructions from their reading and listening, and using these consciously in their writing and speech to achieve particular effects • Knowing and understanding the differences between spoken and written language, including differences associated with formal and informal registers, and between Standard English and other varieties of English Using Standard English confidently in their own writing and speech English • Discussing reading, writing and spoken language with precise and confident use of linguistic and literary terminology | |

Date of completion *Assessor name*.....

MATHS

| <u>Expectations</u> | |
|--|--|
| <ul style="list-style-type: none">• Develop fluency• Consolidate their numerical and mathematical capability from key stage 2 and extend their understanding of the number system and place value to include decimals, fractions, powers and roots.• Select and use appropriate calculation strategies to solve increasingly complex problems• use algebra to generalise the structure of arithmetic, including to formulate mathematical relationships• Substitute values in expressions, rearrange and simplify expressions, and solve equations• Move freely between different numerical, algebraic, graphical and diagrammatic representations [for example, equivalent fractions, fractions and decimals, and equations and graphs] Develop algebraic and graphical fluency, including understanding linear and simple quadratic functions• Use language and properties precisely to analyse numbers, algebraic expressions, 2-D and 3-D shapes, probability and statistics.• Reason mathematically• Extend their understanding of the number system; make connections between number relationships, and their algebraic and graphical representations• Extend and formalise their knowledge of ratio and proportion in working with measures and geometry, and in formulating proportional relations algebraically• Identify variables and express relations between variables algebraically and graphically• Make and test conjectures about patterns and relationships; look for proofs or counterexamples• Begin to reason deductively in geometry, number and algebra, including using geometrical constructions• Interpret when the structure of a numerical problem requires additive, multiplicative or proportional reasoning• Explore what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally. | |
| <u>Solve problems</u> | |
| <ul style="list-style-type: none">• Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems• Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics• Begin to model situations mathematically and express the results using a range of formal mathematical representations• Select appropriate concepts, methods and techniques to apply to unfamiliar and no routine problems | |

MATHS

Number, place value for decimals, measures and integers of any size

- Order positive and negative integers, decimals and fractions
- Use the number line as a model for ordering of the real numbers
- Use the symbols =, \neq , \leq , \geq
- Use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property
- Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative Use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals
- Recognise and use relationships between operations including inverse operations
- Use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations Interpret and compare numbers in standard form $A \times 10^n$ $1 \leq A$.

Date of completion *Assessor name*.....

PHYSICAL EDUCATION

| <u>Expectations</u> | |
|---|--|
| <ul style="list-style-type: none">• Use a range of tactics and strategies to overcome opponents in direct competition through team and individual games [for example, badminton, basketball, cricket, football, hockey, netball, rounder's, rugby and tennis]• Develop their technique and improve their performance in other competitive sports [for example, athletics and gymnastics]• Perform dances using advanced dance techniques within a range of dance styles and forms• Take part in outdoor and adventurous activities which present intellectual and physical challenges and be encouraged to work in a team, building on trust and developing skills to solve problems, either individually or as a group• Analyse their performances compared to previous ones and demonstrate improvement to achieve their personal best• Take part in competitive sports and activities outside school through community links or sports clubs. | |

Date of completion *Assessor name.....*

COMPUTING

Expectations

- Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems
- Understanding several key algorithms that reflect computational thinking (for example ones for sorting and searching) ; use logical reasoning to compare utility of alternative algorithms for the same problem
- Use 2 or more programming languages: at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures (e.g. lists, tables or arrays)
- Design and develop modular programmes that use procedures or functions
- Understanding simple Boolean logic (e.g. AND, OR and NOT) and some of its uses in circuits and programming; understand how numbers can be represented in binary, and to be able to carry out simple operations on binary numbers (e.g. binary addition and conversion)
- Understand the hardware and software components that make use of computer systems, and how they communicate with one another and with other systems
- Understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sound and pictures) can be represented and manipulated digitally, in the form of binary digits
- Undertake creative projects that involve selecting, using and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analyzing data and meeting the needs of known users
- Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability
- Understand a range of ways to use technology safely, respectfully and responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns

Date of completion *Assessor name*.....

PSHE

| <u>Expectations</u> | |
|--|--|
| <u>Families</u> | |
| <ul style="list-style-type: none"> • That there are different types of committed, stable relationships. • How these relationships might contribute to human happiness and their importance for bringing up children • What marriage is, including their legal status e.g. that marriage carries legal rights and protections not available to couples who are cohabiting or who have married, for example, in an unregistered religious ceremony • Why marriage is an important relationship choice for many couples and why it must be freely entered into • The characteristics and legal status of other types of long-term relationships • The roles and responsibilities of parents with respect to raising of children, including the characteristics of successful parenting • How to: determine whether other children, adults or sources of information are trustworthy: judge when a family, friend, intimate or other relationship is unsafe (and to recognise this in others' relationships); and, how to seek help or advice, including reporting concerns about others, if needed | |
| <u>Friendships</u> | |
| <ul style="list-style-type: none"> • The characteristics of positive and healthy friendships (in all contexts, including online) including: trust, respect, honesty, kindness, generosity, boundaries, privacy, consent and the management of conflict, reconciliation and ending relationships. This includes different (non-sexual) types of relationship. • Practical steps they can take in a range of different contexts to improve or support respectful relationships. • How stereotypes, in particular stereotypes based on sex, gender, race, religion, sexual orientation or disability, can cause damage (e.g. how they might normalise non-consensual behaviour or encourage prejudice). • That in school and in wider society they can expect to be treated with respect by others, and that in turn they should show due respect to others, including people in positions of authority and due tolerance of other people's beliefs. • About different types of bullying (including cyberbullying), the impact of bullying, responsibilities of bystanders to report bullying and how and where to get help. • That some types of behaviour within relationships are criminal, including violent behaviour and coercive control. • What constitutes sexual harassment and sexual violence and why these are always unacceptable. • The legal rights and responsibilities regarding equality (particularly with reference to the protected characteristics as defined in the Equality Act 2010) and that everyone is unique and equal. | |

- **Online and media Pupils should know their rights, responsibilities and opportunities online, including that the same expectations of behaviour apply in all contexts, including online.**
- **About online risks, including that any material someone provides to another has the potential to be shared online and the difficulty of removing potentially compromising material placed online.**
- **Not to provide material to others that they would not want shared further and not to share personal material which is sent to them.**
- **What to do and where to get support to report material or manage issues online.**
- **The impact of viewing harmful content.**
- **That specifically sexually explicit material e.g. pornography presents a distorted picture of sexual behaviours, can damage the way people see themselves in relation to others and negatively affect how they behave towards sexual partners.**
- **That sharing and viewing indecent images of children (including those created by children) is a criminal offence which carries severe penalties including jail.**
- **How information and data is generated, collected, shared and used online.**
Being safe Pupils should know 29
- **The concepts of, and laws relating to, sexual consent, sexual exploitation, abuse, grooming, coercion, harassment, rape, domestic abuse, forced marriage, honour-based violence and FGM, and how these can affect current and future relationships.**
- **How people can actively communicate and recognise consent from others, including sexual consent, and how and when consent can be withdrawn (in all contexts, including online). Intimate and sexual relationships, including sexual health Pupils should know**
- **How to recognise the characteristics and positive aspects of healthy one-to-one intimate relationships, which include mutual respect, consent, loyalty, trust, shared interests and outlook, sex and friendship.**
- **That all aspects of health can be affected by choices they make in sex and relationships, positively or negatively, e.g. physical, emotional, mental, sexual and reproductive health and wellbeing.**
- **The facts about reproductive health, including fertility, and the potential impact of lifestyle on fertility for men and women and menopause.**
- **That there are a range of strategies for identifying and managing sexual pressure, including understanding peer pressure, resisting pressure and not pressurising others. That they have a choice to delay sex or to enjoy intimacy without sex.**
- **The facts about the full range of contraceptive choices, efficacy and options available.**
- **The facts around pregnancy including miscarriage.**
- **That there are choices in relation to pregnancy (with medically and legally accurate, impartial information on all options, including keeping the baby, adoption, abortion and where to get further help).**

| | |
|---|--|
| <ul style="list-style-type: none"> • How the different sexually transmitted infections (STIs), including HIV/AIDs, are transmitted, how risk can be reduced through safer sex (including through condom use) and the importance of and facts about testing. • About the prevalence of some STIs, the impact they can have on those who contract them and key facts about treatment. • How the use of alcohol and drugs can lead to risky sexual behaviour. • How to get further advice, including how and where to access confidential sexual and reproductive health | |
|---|--|

Date of completion Assessor name.....

CITIZENHSIP

| | |
|--|--|
| <p><u>Expectations</u></p> <ul style="list-style-type: none"> • The development of the political system of democratic government in the United Kingdom, including the roles of citizens, Parliament and the monarch • The operation of Parliament, including voting and elections, and the role of political parties • The precious liberties enjoyed by the citizens of the United Kingdom • The nature of rules and laws and the justice system, including the role of the police and the operation of courts and tribunals • The roles played by public institutions and voluntary groups in society, and the ways in which citizens work together to improve their communities, including opportunities to participate in school-based activities • The functions and uses of money, the importance and practice of budgeting, and managing risk. | |
|--|--|

Date of completion Assessor name.....

MODERN FOREIGN LANGUAGE

| <u>Expectations</u> | |
|--|--|
| <ul style="list-style-type: none">• Identify and use tenses or other structures which convey the present, past, and future as appropriate to the language being studied• Use and manipulate a variety of key grammatical structures and patterns, including voices and moods, as appropriate• Develop and use a wide-ranging and deepening vocabulary that goes beyond their immediate needs and interests, allowing them to give and justify opinions and take part in discussion about wider issues Use accurate grammar, spelling and punctuation. Linguistic competence• Listen to a variety of forms of spoken language to obtain information and respond appropriately• Transcribe words and short sentences that they hear with increasing accuracy Initiate and develop conversations, coping with unfamiliar language and unexpected responses, making use of important social conventions such as formal modes of address• Express and develop ideas clearly and with increasing accuracy, both orally and in writing• Speak coherently and confidently, with increasingly accurate pronunciation and intonation• Read and show comprehension of original and adapted materials from a range of different sources, understanding the purpose, important ideas and details, and provide an accurate English translation of short, suitable material• Read literary texts in the language [such as stories, songs, poems and letters], to stimulate ideas, develop creative expression and expand understanding of the language and culture Languages• Write prose using an increasingly wide range of grammar and vocabulary, write creatively to express their own ideas and opinions, and translate short written text accurately into the foreign language. | |

Date of completion Assessor name.....

SCIENCE

| | |
|--|--|
| <u>Expectations</u> | |
| <ul style="list-style-type: none">• Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.• Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.• Are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future | |

| | |
|--|--|
| <u>BIOLOGY</u> | |
| <u>Cells and organisation</u> <ul style="list-style-type: none">• Cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope• Functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts• the similarities and differences between plant and animal cells• the role of diffusion in the movement of materials in and between cells• The structural adaptations of some unicellular organisms• The hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms. | |
| <u>The skeletal and muscular systems</u> <ul style="list-style-type: none">• The structure and functions of the human skeleton, to include support, protection, movement and making blood cells• Biomechanics – the interaction between skeleton and muscles, including the measurement of force exerted by different muscles• The function of muscles and examples of antagonistic muscles. | |
| <u>Nutrition and digestion</u> <ul style="list-style-type: none">• Content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed• Calculations of energy requirements in a healthy daily diet• The consequences of imbalances in the diet, including obesity, starvation and deficiency diseases• The tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts)• the importance of bacteria in the human digestive system• Plants making carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots. | |
| <u>Reproduction</u> <ul style="list-style-type: none">• Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle | |

(without details Science 61 of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta

- Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms

Health

- The effects of recreational drugs (including substance misuse) on behaviour, health and life processes.

Material cycles and energy Photosynthesis

- The reactants in, and products of, photosynthesis, and a word summary for photosynthesis The dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere
- The adaptations of leaves for photosynthesis.

Cellular respiration

- Aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life
- A word summary for aerobic respiration
- The process of anaerobic respiration in humans and micro-organisms, including fermentation, and a word summary for anaerobic respiration
- The differences between aerobic and anaerobic respiration in terms of the reactants, the products formed and the implications for the organism. Interactions and interdependencies Relationships in an ecosystem
- The interdependence of organisms in an ecosystem, including food webs and insect pollinated crops
- The importance of plant reproduction through insect pollination in human food security
- How organisms affect, and are affected by, their environment, including the accumulation of toxic materials.

Genetics and evolution Inheritance, chromosomes, DNA and genes

- Heredity as the process by which genetic information is transmitted from one generation to the next
- A simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model
- Differences between species
- The variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation
- The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection

- Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction
- The importance of maintaining biodiversity and the use of gene banks to preserve hereditary material.

CHEMISTRY

The particulate nature of matter

- The properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure
- Changes of state in terms of the particle model. Atoms, elements and compounds
- A simple (Dalton) atomic model
- Differences between atoms, elements and compounds
- Chemical symbols and formulae for elements and compounds
- Conservation of mass changes of state and chemical reactions.

Pure and impure substances

- The concept of a pure substance
- Mixtures, including dissolving
- Diffusion in terms of the particle model
- Simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography
- The identification of pure substances

Chemical reactions

- Chemical reactions as the rearrangement of atoms
- Representing chemical reactions using formulae and using equations
- Combustion, thermal decomposition, oxidation and displacement reactions
- Defining acids and alkalis in terms of neutralisation reactions
- The pH scale for measuring acidity/alkalinity; and indicators
- Reactions of acids with metals to produce a salt plus hydrogen
- Reactions of acids with alkalis to produce a salt plus water
- What catalysts do

Energetics

- Energy changes on changes of state (qualitative)
- Exothermic and endothermic chemical reactions (qualitative).

The Periodic Table

- The varying physical and chemical properties of different elements
- The principles underpinning the Mendeleev Periodic Table
- The Periodic Table: periods and groups; metals and non-metals
- How patterns in reactions can be predicted with reference to the Periodic Table

The properties of metals and non-metals

- The chemical properties of metal and non-metal oxides with respect to acidity.
- Materials**

| | |
|---|--|
| <ul style="list-style-type: none"> • The order of metals and carbon in the reactivity series • The use of carbon in obtaining metals from metal oxides • Properties of ceramics, polymers and composites (qualitative). <p>Earth and atmosphere</p> <ul style="list-style-type: none"> • The composition of the Earth • The structure of the Earth • The rock cycle and the formation of igneous, sedimentary and metamorphic rocks • Earth as a source of limited resources and the efficacy of recycling <p>The carbon cycle</p> <ul style="list-style-type: none"> • The composition of the atmosphere • The production of carbon dioxide by human activity and the impact on climate | |
|---|--|

| | |
|---|--|
| <u>PHYSICS</u> | |
| <u>Energy Calculation of fuel uses and costs in the domestic context</u> | |
| <ul style="list-style-type: none"> • Comparing energy values of different foods (from labels) (kJ) • Comparing power ratings of appliances in watts (W, kW) • Comparing amounts of energy transferred (J, kJ, kW hour) • Domestic fuel bills, fuel use and costs • Fuels and energy resources. Energy changes and transfers • Simple machines give bigger force but at the expense of smaller movement (and vice versa): product of force and displacement unchanged • Heating and thermal equilibrium: temperature difference between two objects leading to energy transfer from the hotter to the cooler one, through contact (conduction) or radiation; such transfers tending to reduce the temperature difference: use of insulators • Other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels. | |
| <u>Changes in systems</u> | |
| <ul style="list-style-type: none"> • Energy as a quantity that can be quantified and calculated; the total energy has the same value before and after a change • Comparing the starting with the final conditions of a system and describing increases and decreases in the amounts of energy associated with movements, temperatures, changes in positions in a field, in elastic distortions and in chemical compositions • Using physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about such changes. | |
| <u>Motion and forces Describing motion</u> | |
| <ul style="list-style-type: none"> • Speed and the quantitative relationship between average speed, distance and time (speed = distance ÷ time) • The representation of a journey on a distance-time graph • Relative motion: trains and cars passing one another | |
| <u>Forces</u> | |

- Forces as pushes or pulls, arising from the interaction between two objects
- Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces
- Moment as the turning effect of a force
- Forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water
- Forces measured in newtons, measurements of stretch or compression as force is changed
- Force-extension linear relation; Hooke's Law as a special case
- Work done and energy changes on deformation
- Non-contact forces: gravity forces acting at a distance on Earth and in space, forces between magnets and forces due to static electricity.

Pressure in fluids

- Atmospheric pressure, decreases with increase of height as weight of air above decreases with height
- Pressure in liquids, increasing with depth; up thrust effects, floating and sinking
- Pressure measured by ratio of force over area – acting normal to any surface. Balanced forces
- Opposing forces and equilibrium: weight held by stretched spring or supported on a compressed surface.

Forces and motion

- Forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only)
- Change depending on direction of force and its size. Waves Observed waves
- Waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel – superposition. Science 66 Sound waves
- Frequencies of sound waves, measured in hertz (Hz); echoes, reflection and absorption of sound
- Sound needs a medium to travel, the speed of sound in air, in water, in solids
- Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal
- Auditory range of humans and animals.

Energy and waves

- Pressure waves transferring energy; use for cleaning and physiotherapy by ultra-sound; waves transferring information for conversion to electrical signals by microphone.

Light waves

- The similarities and differences between light waves and waves in matter
- Light waves travelling through a vacuum; speed of light
- The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface

- Use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye
- Light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras
- Colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection. Electricity and electromagnetism Current electricity
- Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge
- Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current
- Differences in resistance between conducting and insulating components (quantitative).

Static electricity

- Separation of positive or negative charges when objects are rubbed together: transfer of electrons, forces between charged objects
- The idea of electric field, forces acting across the space between objects not in contact.

Magnetism

- Magnetic poles, attraction and repulsion
- Magnetic fields by plotting with compass, representation by field lines
- Earth's magnetism, compass and navigation
- The magnetic effect of a current, electromagnets, D.C. motors (principles only). Matter Physical changes
- Conservation of material and of mass, and reversibility, in melting, freezing, evaporation, sublimation, condensation, dissolving
- Similarities and differences, including density differences, between solids, liquids and gases

Brownian motion in gases

- Diffusion in liquids and gases driven by differences in concentration
- The difference between chemical and physical changes.

Particle model

- The differences in arrangements, in motion and in closeness of particles explaining changes of state, shape and density, the anomaly of ice-water transition
- Atoms and molecules as particles.

Energy in matter

- Changes with temperature in motion and spacing of particles
- Internal energy stored in materials.

Space physics

- Gravity force, weight = mass x gravitational field strength (g), on Earth $g=10$ N/kg, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only)
- Our Sun as a star, other stars in our galaxy, other galaxies

| | |
|---|--|
| <ul style="list-style-type: none"> • The seasons and the Earth’s tilt, day length at different times of year, in different hemispheres • The light year as a unit of astronomical distance. | |
|---|--|

Date of completion Assessor name.....

GEOGRPAHY

| | |
|---|--|
| <p><u>Expectations</u></p> <ul style="list-style-type: none"> • Locational knowledge • Extend their locational knowledge and deepen their spatial awareness of the world’s countries using maps of the world to focus on Africa, Russia, Asia (including China and India), and the Middle East, focusing on their environmental regions, including polar and hot deserts, key physical and human characteristics, countries and major cities Place Knowledge • Understand geographical similarities, differences and links between places through the study of human and physical geography of a region within Africa, and of a region within Asia Human and physical geography • Understand, through the use of detailed place-based exemplars at a variety of scales, the key processes in: <ul style="list-style-type: none"> • Physical geography relating to: geological timescales and plate tectonics; rocks, weathering and soils; weather and climate, including the change in climate from the Ice Age to the present; and glaciation, hydrology and coasts. • Human geography relating to: population and urbanisation; international development; economic activity in the primary, secondary, tertiary and quaternary sectors; and the use of natural resources • Understand how human and physical processes interact to influence, and change landscapes, environments and the climate; and how human activity relies on effective functioning of natural systems Geography – key stage 3 3 Geographical skills and fieldwork. • Build on their knowledge of globes, maps and atlases and apply and develop this knowledge routinely in the classroom and in the field • Interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs • Use Geographical Information Systems (GIS) to view, analyse and interpret places and data • Use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. | |
|---|--|

Date of completion Assessor name.....

HISTORY

| <u>Expectations</u> | |
|--|--|
| <ul style="list-style-type: none">• Pupils should extend and deepen their chronologically secure knowledge and understanding of British, local and world history, so that it provides a well-informed context for wider learning• Pupils should identify significant events, make connections, draw contrasts, and analyse trends within periods and over long arcs of time.• They should use historical terms and concepts in increasingly sophisticated ways. They should pursue historically valid enquiries including some they have framed themselves, and create relevant, structured and evidentially supported accounts in response.• They should understand how different types of historical sources are used rigorously to make historical claims and discern how and why contrasting arguments and interpretations of the past have been constructed. | |

Date of completion Assessor name.....

ART

| <u>Expectations</u> | |
|--|--|
| <ul style="list-style-type: none">• To use a range of techniques to record their observations in sketchbooks, journals and other media as a basis for exploring their ideas.• To use a range of techniques and media, including painting• To increase their proficiency in the handling of different materials• To analyse and evaluate their own work, and that of others, in order to strengthen the visual impact or applications of their work.• About the history of art, craft, design and architecture, including periods, styles and major movements from ancient times up to the present day. | |

Date of completion Assessor name.....

MUSIC

| <u>Expectations</u> | |
|--|--|
| <ul style="list-style-type: none">• Perform, listen to, review and evaluate music across a range of historical periods, genres, styles and traditions, including the works of the great composers and musicians• Learn to sing and to use their voices, to create and compose music on their own and with others, have the opportunity to learn a musical instrument, use technology appropriately and have the opportunity to progress to the next level of musical excellence• Understand and explore how music is created, produced and communicated, including through the inter-related dimensions: pitch, duration, dynamics, tempo, timbre, texture, structure and appropriate musical notations. | |

Date of completion *Assessor name.....*

DESIGN TECH

| <u>Expectations</u> | |
|--|--|
| <ul style="list-style-type: none">• Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world• Build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users• Critique, evaluate and test their ideas and products and the work of others Understand and apply the principles of nutrition and learn how to cook. | |

Date of completion *Assessor name.....*

YOU'VE
COMPLETED
KS3 WELL
DONE

What am I most proud of?

.....
.....

My biggest improvement was

.....
.....

What I am excited for in year 10 and 11

.....
.....

What am I going to do over the summer?

.....
.....



WELCOME TO
KS4
YEARS 10-11

ENGLISH

KEY STAGE 3

Read and appreciate the depth and power of the English literary heritage through:

- Reading a wide range of high-quality, challenging, classic literature and extended literary non-fiction, such as essays, reviews and journalism.

This writing should include whole texts. The range will include:

- At least one play by Shakespeare
- Works from the 19th, 20th and 21st centuries
- Poetry since 1789, including representative Romantic poetry
- Re-reading literature and other writing as a basis for making comparisons
- Choosing and reading books independently for challenge, interest and enjoyment.
- Understand and critically evaluate texts through:
 - Reading in different ways for different purposes, summarising and synthesising ideas and information, and evaluating their usefulness for particular purposes
 - Drawing on knowledge of the purpose, audience for and context of the writing, including its social, historical and cultural context and the literary tradition to which it belongs, to inform evaluation
 - Identifying and interpreting themes, ideas and information
 - Exploring aspects of plot, characterisation, events and settings, the relationships between them and their effects
 - Seeking evidence in the text to support a point of view, including justifying inferences with evidence
 - Distinguishing between statements that are supported by evidence and those that are not, and identifying bias and misuse of evidence
- Analysing a writer's choice of vocabulary, form, grammatical and structural features, and evaluating their effectiveness and impact
- Making critical comparisons, referring to the contexts, themes, characterisation, style and literary quality of texts, and drawing on knowledge and skills from wider reading
- Make an informed personal response, recognising that other responses to a text are possible and evaluating these.

Date of completion *Assessor name*

KEY STAGE 4

Writing Pupils should be taught to:

- Write accurately, fluently, effectively and at length for pleasure and information through:
- Adapting their writing for a wide range of purposes and audiences: to describe, narrate, explain, instruct, give and respond to information, and argue
- Selecting and organising ideas, facts and key points, and citing evidence, details and quotation effectively and pertinently for support and emphasis
- Selecting, and using judiciously, vocabulary, grammar, form, and structural and organisational features, including rhetorical devices, to reflect audience, purpose and context, and using Standard English where appropriate Make notes, draft and write, including using information provided by others [e.g. writing a letter from key points provided; drawing on and using information from a presentation]
- Revise, edit and proof-read through: Reflecting on whether their draft achieves the intended impact
- Restructuring their writing, and amending its grammar and vocabulary to improve coherence, consistency, clarity and overall effectiveness
- Paying attention to the accuracy and effectiveness of grammar, punctuation and spelling.

Grammar and vocabulary Pupils should be taught to:

- Consolidate and build on their knowledge of grammar and vocabulary through: Studying their effectiveness and impact in the texts they read
- Drawing on new vocabulary and grammatical constructions from their reading and listening, and using these consciously in their writing and speech to achieve particular effects
- Analysing some of the differences between spoken and written language, including differences associated with formal and informal registers, and between Standard English and other varieties of English 1 Spelling patterns and guidance are set out in Appendix 1 to the key stage 1 and 2 programmes of study for English
- Using linguistic and literary terminology accurately and confidently in discussing reading, writing and spoken language.

Spoken English Pupils should be taught to:

- Speak confidently, audibly and effectively, including through: Using Standard English when the context and audience require it Working effectively in groups of different sizes and taking on required roles, including leading and managing discussions, involving others productively, reviewing and summarising, and contributing to meeting goals/deadlines
- Listening to and building on the contributions of others, asking questions to clarify and inform, and challenging courteously when necessary
- Planning for different purposes and audiences, including selecting and organising information and ideas effectively and persuasively for formal spoken presentations and debates
- Listening and responding in a variety of different contexts, both formal and informal, and evaluating content, viewpoints, evidence and aspects of presentation
- Improvising, rehearsing and performing play scripts and poetry in order to generate language and discuss language use and meaning, using role, intonation, tone, volume, mood, silence, stillness and action to add impact

Date of completion *Assessor name.....*

MATHS

KEY STAGE 3

- Apply systematic listing strategies, {including use of the product rule for counting}
- Estimate powers and roots of any given positive number}
- Calculate with roots, and with integer {and fractional} indices
- Calculate exactly with fractions, {surds} and multiples of π ; {simplify surd expressions involving squares [for example $12\sqrt{4}\sqrt{3}\sqrt{4}\sqrt{3}\sqrt{2}\sqrt{3} = x\sqrt{2} = x\sqrt{2}$] and rationalise denominators}
- Calculate with numbers in standard form $A \times 10^n$, where $1 \leq A < 10$ and n is an integer
- Change recurring decimals into their corresponding fractions and vice versa}
- Identify and work with fractions in ratio problems
- Apply and interpret limits of accuracy when rounding or truncating, {including upper and lower bounds}.

Algebra In addition to consolidating subject content from key stage 3, pupils should be taught to:

- Simplify and manipulate algebraic expressions (including those involving surds {and algebraic fractions}) by:
- Factorising quadratic expressions of the form $2x^2 + bx + c$ and $2ax^2 + bx + c$, including the difference of two squares; {factorising quadratic expressions of the form $a^2 - b^2$ }
- Simplifying expressions involving sums, products and powers, including the laws of indices
- Know the difference between an equation and an identity; argue mathematically to show algebraic expressions are equivalent, and use algebra to support and construct arguments {and proofs}
- Where appropriate, interpret simple expressions as functions with inputs and outputs; {interpret the reverse process as the 'inverse function'; interpret the succession of two functions as a 'composite function'}

Date of completion *Assessor name*

KEY STAGE 4

Number

- apply systematic listing strategies, {including use of the product rule for counting}
- estimate powers and roots of any given positive number}
- calculate with roots, and with integer {and fractional} indices
- calculate exactly with fractions, {surds} and multiples of π ; {simplify surd expressions involving squares [for example $12\sqrt{3} \times 4\sqrt{3} \times 2\sqrt{3} = x\sqrt{3}$] and rationalise denominators}
- calculate with numbers in standard form $A \times 10^n$, where $1 \leq A < 10$ and n is an integer
- change recurring decimals into their corresponding fractions and vice versa}
- identify and work with fractions in ratio problems
- apply and interpret limits of accuracy when rounding or truncating, {including upper and lower bounds}

Algebra In addition to consolidating subject content from key stage 3, pupils should be taught to:

- Simplify and manipulate algebraic expressions (including those involving surds {and algebraic fractions}) by:
- Factorising quadratic expressions of the form $ax^2 + bx + c$, including the difference of two squares; {factorising quadratic expressions of the form $a^2 - b^2$ }
- Simplifying expressions involving sums, products and powers, including the laws of indices
- Know the difference between an equation and an identity; argue mathematically to show algebraic expressions are equivalent, and use algebra to support and construct arguments {and proofs}
- Where appropriate, interpret simple expressions as functions with inputs and outputs; {interpret the reverse process as the 'inverse function'; interpret the succession of two functions as a 'composite function'}
- Use the form $y = mx + c$ to identify parallel {and perpendicular} lines; find the equation of the line through two given points, or through one point with a given gradient
- Identify and interpret roots, intercepts and turning points of quadratic functions graphically; deduce roots algebraically {and turning points by completing the square}
- -Recognise, sketch and interpret graphs of linear functions, quadratic functions, simple cubic functions, the reciprocal function $y = \frac{1}{x}$, $y = \cos x$ with $x \neq 0$, {the exponential function $y = k^x = e^{kx}$ for positive values of k , and the trigonometric functions (with arguments in degrees), and $y = \tan x$ for angles of any size}
- Sketch translations and reflections of the graph of a given function}
- Plot and interpret graphs (including reciprocal graphs {and exponential graphs}) and graphs of non-standard functions in real contexts, to find approximate solutions to problems such as simple kinematic problems involving distance, speed and acceleration
- calculate or estimate gradients of graphs and areas under graphs (including quadratic and other non-linear graphs), and interpret results in cases such as distance-time graphs, velocity-time graphs and graphs in financial contexts}
- Recognise and use the equation of a circle with centre at the origin; find the equation of a tangent to a circle at a given point}
- Solve quadratic equations {including those that require rearrangement} algebraically by factorising, {by completing the square and by using the quadratic formula}; find approximate solutions using a graph
- Solve two simultaneous equations in two variables (linear/linear {or linear/quadratic}) algebraically; find approximate solutions using a graph
- find approximate solutions to equations numerically using iteration}

- {know and apply to calculate the area, sides or angles of any triangle}
- describe translations as 2D vectors
- apply addition and subtraction of vectors, multiplication of vectors by a scalar, and diagrammatic and column representations of vectors; {use vectors to construct geometric arguments and proofs}.

Probability In addition to consolidating subject content from key stage 3, pupils should be taught to:

- apply the property that the probabilities of an exhaustive set of mutually exclusive events sum to one
- use a probability model to predict the outcomes of future experiments; understand that empirical unbiased samples tend towards theoretical probability distributions, with increasing sample size
- calculate the probability of independent and dependent combined events, including using tree diagrams and other representations, and know the underlying assumptions
- {calculate and interpret conditional probabilities through representation using expected frequencies with two-way tables, tree diagrams and Venn diagrams}.

Statistics In addition to consolidating subject content from key stage 3, pupils should be taught to:

- infer properties of populations or distributions from a sample, whilst knowing the limitations of sampling
- interpret and construct tables and line graphs for time series data
- {construct and interpret diagrams for grouped discrete data and continuous data, i.e. histograms with equal and unequal class intervals and cumulative frequency graphs, and know their appropriate use}
- interpret, analyse and compare the distributions of data sets from univariate empirical distributions through:
 - -appropriate graphical representation involving discrete, continuous and grouped data, {including box plots} -appropriate measures of central tendency (including modal class) and spread {including quartiles and inter-quartile range}
 - -apply statistics to describe a population
 - -use and interpret scatter graphs of bivariate data; recognise correlation and know that it does not indicate causation; draw estimated lines of best fit; make predictions; interpolate and extrapolate apparent trends whilst knowing the dangers of so doing.

Date of completion *Assessor name.....*

P.E

| <u>PE</u> | |
|--|--|
| <ul style="list-style-type: none">• Pupils should tackle complex and demanding physical activities• They should get involved in a range of activities that develops personal fitness and promotes an active, healthy lifestyle.• Use and develop a variety of tactics and strategies to overcome opponents in team and individual games [for example, badminton, basketball, cricket, football, hockey, netball, rounders, rugby and tennis]• develop their technique and improve their performance in other competitive sports,[for example, athletics and gymnastics], or other physical activities [for example, dance]• take part in further outdoor and adventurous activities in a range of environments which present intellectual and physical challenges and which encourage pupils to work in a team, building on trust and developing skills to solve problems, either individually or as a group• evaluate their performances compared to previous ones and demonstrate improvement across a range of physical activities to achieve their personal best• continue to take part regularly in competitive sports and activities outside school through community links or sports clubs. | |

Date of completion *Assessor name.....*

COMPUTING

| <u>COMPUTING</u> | |
|--|--|
| <ul style="list-style-type: none">• all pupils must have the opportunity to study aspects of information technology and computer science at sufficient depth to allow them to progress to higher levels of study or to a professional career <p>All pupils should be taught to:</p> <ul style="list-style-type: none">• develop their capability, creativity and knowledge in computer science, digital media and information technology• develop and apply their analytic, problem-solving, design and computational thinking skills• understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to report a range of concerns | |

Date of completion *Assessor name.....*

P.S.H.E

P.S.H.E

The aim of RSE is to give young people the information they need to help them develop:

- Healthy, nurturing relationships of all kinds, not just intimate relationships.
- It should enable them to know what a healthy relationship looks like and what makes a good friend, a good colleague and a successful marriage or other type of committed relationship
- It should also cover contraception, developing intimate relationships and resisting pressure to have sex (and not applying pressure)
- It should teach what acceptable and unacceptable behaviour in relationships is.
- This will help pupils understand the positive effects that good relationships have on their mental wellbeing, identity, when relationships are not right and understand how much situations can be managed
- It should teach young people to understand human sexuality and respect themselves and others
- Enable young people to mature, build their confidence and self-esteem and understand the reasons for delaying sexual activity
- Support people throughout life, to develop safe, fulfilling and healthy sexual relationships, at the appropriate time
- Develop knowledge about safer sex and sexual health
- Make sure young people are equipped to make safe, informed and healthy choices as they progress through adult life

Date of completion *Assessor name.....*

CITIZENSHIP

| CITIZENSHIP | |
|--|--|
| <ul style="list-style-type: none">• parliamentary democracy and the key elements of the constitution of the United Kingdom, including the power of government, the role of citizens and Parliament in holding those in power to account, and the different roles of the executive, legislature and judiciary and a free press• the different electoral systems used in and beyond the United Kingdom and actions citizens can take in democratic and electoral processes to influence decisions locally, nationally and beyond• other systems and forms of government, both democratic and non-democratic, beyond the United Kingdom• local, regional and international governance and the United Kingdom's relations with the rest of Europe, the Commonwealth, the United Nations and the wider world• human rights and international law• the legal system in the UK, different sources of law and how the law helps society deal with complex problems• diverse national, regional, religious and ethnic identities in the United Kingdom and the need for mutual respect and understanding• -the different ways in which a citizen can contribute to the improvement of his or her community, to include the opportunity to participate actively in community volunteering, as well as other forms of responsible activity• -income and expenditure, credit and debt, insurance, savings and pensions, financial products and services, and how public money is raised and spent. | |

Date of completion *Assessor name*

MODERN FOREIGN LANGUAGE

| Modern foreign language | |
|---|--|
| <ul style="list-style-type: none">• Identity and culture, local, national, international and global areas of interest• current and future study and employment• literary texts can include extracts and excerpts, adapted and abridged as appropriate, from poems, letters, short stories, essays, novels or plays from contemporary and historical sources, subject to copyright 4• the content, contexts and purposes of a GCSE specification in a modern foreign language will provide an appropriate foundation for A level study and a suitable preparation for higher education or employment. | |

Date of completion *Assessor name.....*

SCIENCE

KEY STAGE 3 AND 4

The ways in which scientific methods and theories develop over time

- using a variety of concepts and models to develop scientific explanations and understanding
- appreciating the power and limitations of science and considering ethical issues which may arise
- explaining every day and technological applications of science; evaluating associated personal, social, economic and environmental implications; and making decisions based on the evaluation of evidence and arguments
- evaluating risks both in practical science and the wider societal context, including perception of risk
- recognising the importance of peer review of results and of communication of results to a range of audiences.
- using scientific theories and explanations to develop hypotheses
- planning experiments to make observations, test hypotheses or explore phenomena
- applying a knowledge of a range of techniques, apparatus, and materials to select those appropriate both for fieldwork and for experiments
- carrying out experiments appropriately, having due regard to the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations
- recognising when to apply a knowledge of sampling techniques to ensure any samples collected are representative
- making and recording observations and measurements using a range of apparatus and methods
- evaluating methods and suggesting possible improvements and further investigations.
- presenting observations and other data using appropriate methods
- translating data from one form to another
- carrying out and representing mathematical and statistical analysis - representing distributions of results and making estimations of uncertainty
- interpreting observations and other data, including identifying patterns and trends, making inferences and drawing conclusions
- presenting reasoned explanations, including relating data to hypotheses
- being objective, evaluating data in terms of accuracy, precision, repeatability and reproducibility and identifying potential sources of random and systematic error
- communicating the scientific rationale for investigations, including the methods used, the findings and reasoned conclusions, using paper-based and electronic reports and presentations

BIOLOGY

- life processes depend on molecules whose structure is related to their function
- the fundamental units of living organisms are cells, which may be part of highly adapted structures including tissues, organs and organ systems, enabling life processes to be performed more effectively
- living organisms may form populations of single species, communities of many species and ecosystems, interacting with each other, with the environment and with humans in many different ways
- living organisms are interdependent and show adaptations to their environment
- life on Earth is dependent on photosynthesis in which green plants and algae trap light from the Sun to fix carbon dioxide and combine it with hydrogen from water to make organic compounds and oxygen
- organic compounds are used as fuels in cellular respiration to allow the other chemical reactions necessary for life
- the chemicals in ecosystems are continually cycling through the natural world
- the characteristics of a living organism are influenced by its genome and its interaction with the environment
- evolution occurs by the process of natural selection and accounts both for biodiversity and how organisms are all related to varying degrees

Cell biology

- cells as the basic structural unit of all organisms; adaptations of cells related to their functions; the main sub-cellular structures of eukaryotic and prokaryotic cells
- stem cells in animals and meristems in plants
- enzymes
- factors affecting the rate of enzymatic reactions
- the importance of cellular respiration; the processes of aerobic and anaerobic respiration
- carbohydrates, proteins, nucleic acids and lipids as key biological molecules

Transport systems

- the need for transport systems in multicellular organisms, including plants
- the relationship between the structure and functions of the human circulatory system.

Health, disease and the development of medicines

- the relationship between health and disease
- communicable diseases including sexually transmitted infections in humans (including HIV/AIDs)
- non-communicable diseases
- bacteria, viruses and fungi as pathogens in animals and plants
- body defences against pathogens and the role of the immune system against disease
- reducing and preventing the spread of infectious diseases in animals and plants
- the process of discovery and development of new medicines
- the impact of lifestyle factors on the incidence of non-communicable diseases.

Coordination and control

- principles of nervous coordination and control in humans
- the relationship between the structure and function of the human nervous system
- the relationship between structure and function in a reflex arc
- principles of hormonal coordination and control in humans
- hormones in human reproduction, hormonal and non-hormonal methods of contraception
- homeostasis

Photosynthesis

- photosynthesis as the key process for food production and therefore biomass for life
- the process of photosynthesis
- factors affecting the rate of photosynthesis.

Ecosystems

- levels of organisation within an ecosystem
- some abiotic and biotic factors which affect communities; the importance of interactions between organisms in a community
- how materials cycle through abiotic and biotic components of ecosystems
- the role of microorganisms (decomposers) in the cycling of materials through an ecosystem
- organisms are interdependent and are adapted to their environment
- the importance of biodiversity
- methods of identifying species and measuring distribution, frequency and abundance of species within a habitat
- positive and negative human interactions with ecosystems

Evolution, inheritance and variation

- the genome as the entire genetic material of an organism
- how the genome, and its interaction with the environment, influence the development of the phenotype of an organism
- the potential impact of genomics on medicine
- most phenotypic features being the result of multiple, rather than single, genes
- single gene inheritance and single gene crosses with dominant and recessive phenotypes
- sex determination in humans
- genetic variation in populations of a species
- the process of natural selection leading to evolution
- the evidence for evolution
- developments in biology affecting classification
- the importance of selective breeding of plants and animals in agriculture
- the uses of modern biotechnology including gene technology; some of the practical and ethical considerations of modern biotechnology

CHEMISTRY

- matter is composed of tiny particles called atoms and there are about 100 different naturally-occurring types of atoms called elements
- elements show periodic relationships in their chemical and physical properties
- these periodic properties can be explained in terms of the atomic structure of the elements
- atoms bond either by transferring electrons from one atom to another or by sharing electrons
- the shapes of molecules (groups of atoms bonded together) and the way giant structures are arranged is of great importance in terms of the way they behave
- reactions can occur when molecules collide and do so at different rates due to differences in molecular collisions
- chemical reactions take place in only three different ways: proton transfer, electron transfer, electron sharing
- energy is conserved in chemical reactions so can therefore be neither created nor destroyed.

Atomic structure and the Periodic Table

- a simple model of the atom consisting of the nucleus and electrons, relative atomic mass, electronic charge and isotopes
- the number of particles in a given mass of a substance
- the modern Periodic Table, showing elements arranged in order of atomic number
- position of elements in the Periodic Table in relation to their atomic structure and arrangement of outer electrons
- properties and trends in properties of elements in the same group
- characteristic properties of metals and non-metals
- chemical reactivity of elements in relation to their position in the Periodic Table. Structure, bonding and the properties of matter
- changes of state of matter in terms of particle kinetics, energy transfers and the relative strength of chemical bonds and intermolecular forces
- types of chemical bonding: ionic, covalent, and metallic
- bulk properties of materials related to bonding and intermolecular forces
- bonding of carbon leading to the vast array of natural and synthetic organic compounds that occur due to the ability of carbon to form families of similar compounds, chains and rings
- structures, bonding and properties of diamond, graphite, fullerenes and graphene.

Chemical changes

- determination of empirical formulae from the ratio of atoms of different kinds
- balanced chemical equations, ionic equations and state symbols
- identification of common gases
- the chemistry of acids; reactions with some metals and carbonates
- pH as a measure of hydrogen ion concentration and its numerical scale
- electrolysis of molten ionic liquids and aqueous ionic solutions
- reduction and oxidation in terms of loss or gain of oxygen.

Energy changes in chemistry

- Measurement of energy changes in chemical reactions (qualitative)
- Bond breaking, bond making, activation energy and reaction profiles (qualitative). Rate and extent of chemical change
- factors that influence the rate of reaction: varying temperature or concentration, changing the surface area of a solid reactant or by adding a catalyst
- factors affecting reversible reactions.

Chemical analysis

- distinguishing between pure and impure substances
- separation techniques for mixtures of substances: filtration, crystallisation, chromatography, simple and fractional distillation
- quantitative interpretation of balanced equations
- concentrations of solutions in relation to mass of solute and volume of solvent.
- Chemical and allied industries
- life cycle assessment and recycling to assess environmental impacts associated with all the stages of a product's life
- the viability of recycling of certain materials
- carbon compounds, both as fuels and feedstock, and the competing demands for limited resources
- fractional distillation of crude oil and cracking to make more useful materials
- extraction and purification of metals related to the position of carbon in a reactivity series.

Earth and atmospheric science

- evidence for composition and evolution of the Earth's atmosphere since its formation
- evidence, and uncertainties in evidence, for additional anthropogenic causes of climate change
- potential effects of, and mitigation of, increased levels of carbon dioxide and methane on the Earth's climate
- common atmospheric pollutants: sulphur dioxide, oxides of nitrogen, particulates and their sources
- The Earth's water resources and obtaining potable water.

PHYSICS

- the use of models, as in the particle model of matter or the wave models of light and of sound
- the concept of cause and effect in explaining such links as those between force and acceleration, or between changes in atomic nuclei and radioactive emissions
- the phenomena of 'action at a distance' and the related concept of the field as the key to analysing electrical, magnetic and gravitational effects
- that differences, for example between pressures or temperatures or electrical potentials, are the drivers of change
- that proportionality, for example between weight and mass of an object or between force and extension in a spring, is an important aspect of many models in science

Energy

- energy changes in a system involving heating, doing work using forces, or doing work using an electric current; calculating the stored energies and energy changes involved
- power as the rate of transfer of energy
- conservation of energy in a closed system; dissipation
- calculating energy efficiency for any energy transfers
- renewable and non-renewable energy sources used on Earth; changes in how these are used.

Forces

- forces and fields: electrostatic, magnetic, gravity
- forces as vectors
- calculating work done as force \times distance; elastic and inelastic stretching
- pressure in fluids acts in all directions: variation in Earth's atmosphere with height, with depth for liquids, up-thrust force (qualitative).

Forces and motion

- speed of sound; estimating speeds and accelerations in everyday contexts
- interpreting quantitatively graphs of distance, time, and speed
- acceleration caused by forces; Newton's First Law
- weight and gravitational field strength
- decelerations and braking distances involved on roads.

Wave motion

- amplitude, wavelength and frequency; relating velocity to frequency and wavelength
- transverse and longitudinal waves
- electromagnetic waves and their velocity in vacuum; waves transferring energy; wavelengths and frequencies from radio to gamma-rays
- velocities differing between media: absorption, reflection, refraction effects
- production and detection, by electrical circuits, or by changes in atoms and nuclei
- uses in the radio, microwave, infra-red, visible, ultra-violet, X-ray and gamma-ray regions, hazardous effects on bodily tissues.

Electricity

- measuring resistance using p.d. and current measurements
- exploring current, resistance and voltage relationships for different circuit elements, including their graphical representations
- quantity of charge flowing as the product of current and time
- drawing circuit diagrams; exploring equivalent resistance for resistors in series
- the domestic a.c. supply; live, neutral and earth mains wires; safety measures
- power transfer related to p.d. and current, or current and resistance.

Magnetism and electromagnetism

- exploring the magnetic fields of permanent and induced magnets, and the Earth's magnetic field, using a compass
- magnetic effects of currents; how solenoids enhance the effect
- how transformers are used in the national grid and the reasons for their use.

The structure of matter

- relating models of arrangements and motions of the molecules in solid, liquid and gas phases to their densities
- melting, evaporation, and sublimation as reversible changes
- calculating energy changes involved on heating, using specific heat capacity; and those involved in changes of state, using specific latent heat
- links between pressure and temperature of a gas at constant volume, related to the motion of its particles (qualitative).

Atomic structure

- the nuclear model and its development in the light of changing evidence
- masses and sizes of nuclei, atoms and small molecules
- differences in numbers of protons and neutrons related to masses and identities of nuclei; isotope characteristics and equations to represent changes
- ionisation; absorption or emission of radiation related to changes in electron orbit
- radioactive nuclei; emission of alpha or beta particles, neutrons, or gamma-rays, related to changes in the nuclear mass and/or charge
- radioactive materials, half-life, irradiation, contamination and their associated hazardous effects; waste disposal
- nuclear fission, nuclear fusion and our Sun's energy Space physics
- the main features of the solar system

Date of completion Assessor name.....

GEOGRAPHY

GEOGRAPHY

- Locational knowledge and contextual knowledge of the world's continents, countries, regions and their physical, environmental and human features should be developed across the whole specification and should include:
- appreciation of different spatial, cultural and political contexts
- Recognition of important links and inter
- relationships between places and environments at a range of scales from local to global
- contextual knowledge of any countries from which case studies and exemplars are chosen. (It is required that exemplars and case studies relate to at least two countries other than the UK)

Fieldwork

- The use of a range of maps, atlases, Ordnance Survey maps, satellite imagery and other graphic and digital material² including the use of Geographical Information Systems (GIS), to obtain, illustrate, analyse and evaluate geographical information
- To include making maps and sketches to present and interpret geographical information
- Different approaches to fieldwork undertaken in at least two contrasting environments
- should include exploration of physical and human processes and the interactions between them and should involve the collection of primary (It is not required that these bullet points are all addressed in each of the four areas of geography, only that they are all addressed across the specification as a whole)
- For the purposes of examinations, this material may be ready prepared GIS material, for example from screen shots or copies of maps derived from prepared GIS. It need not be GIS material prepared by students
- physical and human data (but these requirements need not all be addressed in each piece of fieldwork)
- Data' should include both qualitative and quantitative data and data from both primary and secondary sources: fieldwork data; GIS material; written and digital sources; visual and graphical sources; and numerical and statistical information.
- Using data should include its collection, interpretation and analysis, including the application of appropriate quantitative and statistical techniques (a list of required skills and techniques is given in the Appendix); it also includes the effective presentation, communication and evaluation of material. (formulating enquiry and argument)
- The ability to identify questions and sequences of enquiry to write descriptively, analytically and critically, to communicate their ideas effectively, to develop an extended written argument, and to draw well-evidenced and informed conclusions about geographical questions and

Place, process and relationships

- Knowledge and understanding of the UK's geography, both in overview and with some in depth study, to include its physical and human landscapes, environmental challenges, changing economy and society, the importance of cultural and political factors, and its relationships with the wider world.
- Can be achieved by study in combination with other physical, human and environmental study topics, but students must also study the UK as a country and draw across physical and human characteristics to summarise significant geographical features and issues

Physical geography

- How geomorphic processes at different scales, operating in combination with geology, climate and human activity have influenced and continue to influence the landscapes of the UK.
- This should include detailed reference to at least two different and distinctive physical landscapes in the UK.

Changing weather and climate

- The causes, consequences of and responses to extreme weather conditions and natural weather hazards, recognising their changing distribution in time and space and drawing on an understanding of the global circulation of the atmosphere.
- The spatial and temporal characteristics, of climatic change and evidence for different causes, including human activity, from the beginning of the Quaternary period (2.6 million years ago) to the present day.

Global ecosystems and environment

- An overview of the distribution and characteristics of large scale natural global ecosystems. For two selected ecosystems, draw out the interdependence of climate, soil, water, plants, animals and humans; the processes and interactions that operate within them at different scales; and issues related to biodiversity and to their sustainable use and
- An overview of how humans use, modify and change ecosystems and environments in order to obtain food, energy and water resources.
- Detailed study of one of either food, energy or water, recognising the changing characteristics and distribution of demand and supply, past and present impacts of human intervention, and issues related to their sustainable use and management at a variety of scales

Human geography

- Cities and urban society – An overview of the causes and effects of rapid urbanisation and contrasting urban trends in different parts of the world with varying characteristics of economic and social development. For at least one major city in an economically advanced country and one major city in a poorer country or recently emerging economy, examine ways of life and contemporary challenges arising from and influencing urban change.
- Both city studies should be set within the context of their region, country and the wider world, including an understanding of the causes and impacts of national and international migration on the growth and character of these cities.

Global economic and development issues

- The causes and consequences of uneven development at global level as the background for considering the changing context of population, economy and society and of technological and political development in at least one poorer country or one that is within a newly emerging economy
- Country study should include examination of the wider political, social and environmental context within which the country is placed, the changing nature of industry and investment, and the characteristics of international trade, aid and geo-political relationships with respect to that country.

Date of completion Assessor name.....

HISTORY

| <u>HISTORY</u> | |
|---|--|
| <ul style="list-style-type: none"> • Develop and extend their knowledge and understanding of specified key events, periods and societies in local, British, and wider world history; and of the wide diversity of human experience • Engage in historical enquiry to develop as independent learners and as critical and reflective thinkers • Develop 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 • Develop an awareness of why people, events and developments have been accorded historical significance and how and why different interpretations have been constructed about them • Organise and communicate their historical knowledge and understanding in different ways and reach substantiated conclusions. | |

Date of completion *Assessor name.....*

ART

| <u>ART</u> | |
|---|--|
| <ul style="list-style-type: none"> • Actively engage in the creative process of art, craft and design in order to develop as effective and independent learners, and as critical and reflective thinkers with enquiring minds • develop creative, imaginative and intuitive capabilities when exploring and making images, artefacts and products • become confident in taking risks and learn from experience when exploring and experimenting with ideas, processes, media, materials and techniques • develop critical understanding through investigative, analytical, experimental, practical, technical and expressive skills • develop and refine ideas and proposals, personal outcomes or solutions with increasing independence • acquire and develop technical skills through working with a broad range of media, materials, techniques, processes and technologies with purpose and intent • develop knowledge and understanding of art, craft and design in historical and contemporary contexts, societies and cultures • develop an awareness of the different roles and individual work practices evident in the production of art, craft and design in the creative and cultural industries | |

| | |
|--|--|
| <ul style="list-style-type: none"> • develop an awareness of the purposes, intentions and functions of art, craft and design in a variety of contexts and as appropriate to students' own work • demonstrate safe working practices in art, craft and design | |
|--|--|

Date of completion *Assessor name*.....

MUSIC

| | |
|---|--|
| <u>MUSIC</u> | |
| <ul style="list-style-type: none"> • Engage actively in the process of music study • develop performing skills individually and in groups to communicate musically with fluency and control of the resources used • develop composing skills to organise musical ideas and make use of appropriate resources • recognise links between the integrated activities of performing, composing and appraising and how this informs the development of music • broaden musical experience and interests, develop imagination and foster creativity • develop knowledge, understanding and skills needed to communicate effectively as musicians • develop awareness of a variety of instruments, styles and approaches to performing and composing • develop awareness of music technologies and their use in the creation and presentation of music • recognise contrasting genres, styles and traditions of music, and develop some awareness of musical chronology • develop as effective and independent learners with enquiring minds • reflect upon and evaluate their own and others' music • engage with and appreciate the diverse heritage of music, in order to promote personal, social, intellectual and cultural development. | |

Date of completion *Assessor name*.....

DESIGN TECH

DESIGN TECHNOLOGY

- demonstrate their understanding that all design and technological activity takes place within contexts that influence the outcomes of design practice
- develop realistic design proposals as a result of the exploration of design opportunities and users' needs, wants and values
- use imagination, experimentation and combine ideas when designing
- develop the skills to critique and refine their own ideas whilst designing and making
- communicate their design ideas and decisions using different media and techniques, as appropriate for different audiences at key points in their designing
- develop decision making skills, including the planning and organisation of time and resources when managing their own project work
- develop a broad knowledge of materials, components and technologies and practical skills to develop high quality, imaginative and functional prototypes
- be ambitious and open to explore and take design risks in order to stretch the development of design proposals, avoiding clichéd or stereotypical responses
- consider the costs, commercial viability and marketing of products
- demonstrate safe working practices in design and technology
- use key design and technology terminology including those related to: designing, innovation and communication; materials and technologies; making, manufacture and production; critiquing, values and ethics.

Date of completion *Assessor name.....*

YOU'VE
COMPLETED
KS4 WELL
DONE

YOU'RE NOW ONTO
YOUR NEXT STEPS IN
LIFE. WHETHER YOU
CHOOSE TO STAY HERE
WITH US FOR SIXTH
FORM, OR MOVE ON TO
SOMETHING NEW. WE
ARE SO PROUD OF YOU

What am I most proud of?

.....
.....

My biggest improvement was

.....
.....

What are my next steps?

.....
.....
.....
.....