

Computing Across the Curriculum within Key Stage 4



Subject / Strand	Computational thinking	Analytical Skills	Problem Solving & Design	Creativity	E-Safety
Art & Photography	<ul style="list-style-type: none"> Using algorithmic thinking to work through design stages using well-defined steps to create an outcome (sequencing). Pattern recognition in artworks and surface pattern design. Development of ideas and sampling – using decomposition to break down an image or idea, using a range of materials to sample techniques, working on once component at a time. 	<ul style="list-style-type: none"> Review Primary and Secondary image sources. Able to discuss the significance of imagery and compare it to others. Extract useful information from sources to use for written analysis. Draw an overall conclusion based on evidence. 	<ul style="list-style-type: none"> Create design ideas. Work around issues and solving problems such as issues with design choices/construction. Solving the issue of the best materials and techniques to use for a specific purpose/piece of work. Decision making and implementation of ideas. 	<ul style="list-style-type: none"> Creativity skills demonstrated throughout KS4. Research, ideas generation, exploration of materials, techniques and processes and the creation of outcomes fulfils this, using a variety of software. 	<ul style="list-style-type: none"> Safe use of technology employed during the gathering of research whilst using the internet.
Business	<ul style="list-style-type: none"> Use decomposition to break down exam questions, based on question type, knowing how many marks and linked strands are required for maximum marks. Abstraction required in section B and C questions to filter out unnecessary detail and to focus on specific context required for A02. Algorithmic thinking to be applied when working through BLT (because, leading to, therefore) stages in extended answers. Pattern recognition used when identifying similar impacts across different business topics. 	<ul style="list-style-type: none"> Review Primary and Secondary sources, specifically graphs and charts, to complete identify questions. Extract relevant detail from section B and C case studies to complement answers and achieve maximum A02 marks. Formulate arguments based of the sources within section B and C case studies. Make judgments for which options will be most suitable to answer based on prior knowledge when completing justify questions. 	<ul style="list-style-type: none"> Use problem solving to identify the correct finance formulas to correctly calculate finance based questions. Decision making used when identify impacts of each option when answering justify and evaluate questions. 	<ul style="list-style-type: none"> Creativity used when generating break-even and bar chart stock graphs, using appropriate software. Use online revision like to help students answer creative questions that engage them. Students to create creative revision resource such knowledge organisers and fill in the blank booklets, using appropriate software. 	<ul style="list-style-type: none"> Discuss e-safety when discussing online reviews and social media during the promotion section of the marketing mix. Discussions around the lack of laws (data protection and copyright) surrounding manufacturing and production costs in different countries.
Health & Social Care	<ul style="list-style-type: none"> Explain the impacts of actions using a logical chain of reasoning (sequencing). 	<ul style="list-style-type: none"> Extract useful information from scenarios to use for describe and explain questions. Critical thinking using reasoning to analyse and evaluate. Make a reasoned qualitative judgement considering different factors and using available knowledge/experience to answer exam questions. 	<ul style="list-style-type: none"> Explain the impacts of actions using a logical chain of reasoning. 	<ul style="list-style-type: none"> Use of creativity to produce a health promotion campaign, using appropriate software, to be presented to peers. 	<ul style="list-style-type: none"> Safe use of technology employed during the gathering of research whilst using the internet for coursework. Exploring the Data Protection Act allows students to understand how to keep electronic data safe.

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Dance	<ul style="list-style-type: none"> • Algorithmic thinking using sequencing when choreographing or learning dances. • Decomposition skills when dances are broken down into smaller components in order to refine them. • Pattern recognition used to develop good technique and movement patterns. 	<ul style="list-style-type: none"> • Review relevant primary and secondary sources. <ul style="list-style-type: none"> ○ Use this information to reach an interpretation of what happened and formulate an argument. ○ Extract the most useful quotations to use as evidence. ○ Draw an overall conclusion based on a balance of evidence. • Students' recorded performances are analysed and evaluated. • Professional performance works and the work of dance companies and practitioners analysed. 	<ul style="list-style-type: none"> • Students work in groups to make creative decisions and confront and overcome issues as they arise such as staging, blocking and choreography 	<ul style="list-style-type: none"> • Creating a trampoline or dance routine. • When a creative performer is facing a problem, they can come up with an answer to that problem that is unexpected by the opponent. Creativity can be shown through a skill, movement or a tactic. 	<ul style="list-style-type: none"> • Safe use of technology employed during the gathering of research whilst using the internet.
Drama	<ul style="list-style-type: none"> • Algorithmic thinking using sequencing when choreographing and blocking scenes. • Pattern recognition when performing and analysing scripts, seeing patterns in the lines in the play/musical. 	<ul style="list-style-type: none"> • Students analyse own performances and then evaluate the effectiveness. • Analyse professional performances and drama practitioners. 	<ul style="list-style-type: none"> • Working in groups and creating performances. Being creative and making decisions. • Overcoming issues as they arise such as staging, blocking, choreography, and characterisation. 	<ul style="list-style-type: none"> • Using digital media to create backdrops, sound effects and projections used in performances. • Record and edit performances. • The use of lighting and sound effects using computers and lighting desks. 	<ul style="list-style-type: none"> • Safe use of sharing media across the internet. • Copyright in performances and live productions.

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Design & Technology	<ul style="list-style-type: none"> Using algorithmic thinking to work through design stages using well defined steps to an outcome. Development of ideas and sampling using decomposition to break down an image or idea, using a range of materials to sample techniques, working on one component at a time. Pattern recognition using CAD/CAM to design and explore different manufacturing techniques/scaling sizes. 2D/3D design linked to operating different manufacturing designs. 	<ul style="list-style-type: none"> Analysing information to make an overall conclusion based on the outcome of the design and model. Analysis of statistics and data to look for trends and to draw conclusions in manufacturing processes. Critical thinking using reasoning to analyse and evaluate. Allowing the opportunity to give opinions, consider alternative arguments, weigh up evidence and listen to and respond to the views of others when creating designs and prototypes. 	<ul style="list-style-type: none"> Create design ideas. Work around issues and solving problems such as issues with design choices/construction. Solving the issue of the best materials and techniques to use for a specific purpose/piece of work. Decision making and implementation of ideas against a brief. 	<ul style="list-style-type: none"> Creativity skills demonstrated throughout KS4. <ul style="list-style-type: none"> Research, ideas generation, exploration of materials, techniques and processes and the creation of outcomes fulfils this using a range of CAD/CAM software. 	<ul style="list-style-type: none"> Safe use of technology employed during the gathering of research whilst using the internet for coursework. Exploring the Data Protection Act allows students to understand how to keep electronic data safe. Safe and lawful use of information from other sources.
English	<ul style="list-style-type: none"> Identifying and exploring narrative arcs and patterns within the stereotypical nature of an arc as well as the sequencing and composition of narratives creatively and independently. Breaking down large chunks of analysis into smaller components. Identifying patterns in speech and dialogue. Semantic field analysis. Analysis within poetry of rhyme and rhythm. 	<ul style="list-style-type: none"> Analysis of language and structure. Analysis of world seminal texts, Shakespeare plays, pre and post 1900 poetry, modern drama. Explorations and evaluations of writers' viewpoints and perspectives. Responding to the views of others and formulating own arguments and perspectives. 	<ul style="list-style-type: none"> Translation of Shakespearean and pre 1900 Literature into modern English. Use of glossaries to extend vocabulary and understanding. Decoding skills to break down quotations and inferences / deeper meanings. Decoding at word level – deconstructing meaning in a complex text. Etymology of words to enhance understanding. 	<ul style="list-style-type: none"> Creative writing, designing descriptions, narrative arcs, stories, poetry, using images as stimulus etc. using appropriate software Encouraging creativity and imaginative ideas. Using reading to enhance imagination and to inspire own writing. Inferences based on own understanding of creative intent of writers. 	<ul style="list-style-type: none"> The dangers of social media explored through writing to argue / persuade. Fear Factor in Y8 explores stereotyping and prejudice perpetuated on the internet. Search for Truth in Y9 is focussed on explorative journalism, students encouraged not to believe everything they read online or in print. Explores how the media can manipulate the viewpoints of society.
Food Technology	<ul style="list-style-type: none"> Abstraction and decomposition in paring down language chunks for closer analysis and reapplication across contexts when looking into different nutritional properties and designing food labels. Application of algorithmic thinking in production and manipulation of grammatical structures and processing when sequencing and creating time plans and recipe cards. 	<ul style="list-style-type: none"> Able to analyse the significance of nutritional needs, comparing to others. Extract useful information from sources to use for written analysis such as recipes and RI (recommended intake and legislation linked to food safety). Draw an overall conclusion based on evidence when evaluating dishes using our senses, using star diagrams alongside written text. Make a reasoned qualitative judgement considering different factors and knowledge/experience to answer exam questions. 	<ul style="list-style-type: none"> Create design ideas linked to a contextual challenge. Work around issues and solving problems such as customer needs and dietary requirements. Solving the issue of the best equipment, ingredients and techniques to use for a specific ingredient. Decision making and implementation of ideas before, during and after evaluations. 	<ul style="list-style-type: none"> Creativity skills demonstrated throughout KS4 linked to food styling from images and research using digital media. Research, ideas generation, exploration of materials, techniques and processes and the creation of outcomes. Use of online language learning tools e.g. digital textbook and SKO for creating individualised retrieval and practise. 	<ul style="list-style-type: none"> Safe use of technology employed during the gathering of research whilst using the internet for coursework. Exploring the Data Protection Act allows students to understand how to keep electronic data safe. Safe and lawful use of information from other sources.

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MFL	<ul style="list-style-type: none"> • Pattern recognition in applications of phonics, vocabulary/syntax and grammatical processes. • Abstraction and decomposition in paring down language chunks for closer analysis and reapplication across contexts. • Application of algorithmic thinking in production and manipulation of grammatical structures and processing. • Recognition of trends and exceptions in irregular and colloquial structures and verbs which do not follow predefined patterns. 	<ul style="list-style-type: none"> • Analyse and appraise chunked language to identify and reinforce phonological, lexical and grammatical knowledge. • Analysis of rich texts to identify and evaluate language use in context. 	<ul style="list-style-type: none"> • Grammar and translation tasks solving problems of language choice and interconnectivity across syntactical and lexical sequences of speech/writing. • Problem solving informing choices of tense, time frame and mood alongside stylistic choices to enhance and develop language richness in written/spoken tasks. • Transactional role play: decision making and requesting correct information in context. 	<ul style="list-style-type: none"> • Creation of audio files for preparation and practise in speaking tasks including mock and final exams, using appropriate software. • Use of online language learning tools e.g. Quizlet, Blooket for creating individualised retrieval and practise. 	<ul style="list-style-type: none"> • AQA Theme 1, Topic 2: Technology in Everyday life. Exploration and discussion of online risks, device/Internet usage including frequency and addiction, consequences of excessive internet usage, advantages and disadvantages of technology and the internet.
Geography	<ul style="list-style-type: none"> • Use of models to describe and explain abstract concepts such as urbanisation, water cycle, migration, glaciation, nutrient cycle and DTM. • Algorithmic thinking to understand complex theories in geography such as the formation of a corrie. • Recognition of trends in data in the use of graphs/statistical work and then be able to draw conclusions. • Decomposition breaking down themes in geography to understand the bigger picture such as studying urbanisation through the lens of migration, natural increase, squatter settlements and sustainability. 	<ul style="list-style-type: none"> • Extract useful information from sources, graphs and maps. • Extraction of relevant information from given text and data to draw conclusions and evaluate. • Fieldwork to analyse the validity of conclusions, trends and patterns. • Understand that people have different opinions and be able to make a balanced judgement/conclusion. 	<ul style="list-style-type: none"> • Fieldwork involves an unseen element; therefore, students use problem solving when they are issued an evaluation (provided with a problem) and students suggest solutions. • Decision making and implementation of ideas (Issue Evaluation). • Problem solving the opportunities and challenges that the physical world presents the human life. Students judge the significance of each problem or opportunity in order to make a judgement. 	<ul style="list-style-type: none"> • Creation of graphs and data presentation techniques for the student's primary fieldwork findings, using appropriate software. • Use of online learning tools such as Seneca, Internet Geography, MS Forms, Cool Geography and Quizlet for creating individualised retrieval and practise. 	<ul style="list-style-type: none"> • Safe use of technology employed during the gathering of research whilst using the internet. • Students complete fieldwork and discuss ethics on how people can actively communicate and recognise consent from others, and how and when consent can be withdrawn.

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Music	<ul style="list-style-type: none"> Use algorithmic thinking to work a key structure to compose music. Step by Step process, there is a sequence in these steps. Use algorithms when looking and studying different intervals (patterns) during listening and composing sessions. Algorithmic thinking is used in every performance such as rhythmic patterns and time keeping. Decomposition of rhythms in performance, composition and analysing. Abstraction of music when studying set works stripping away all unnecessary details. Stripping away melody and harmony to see chord structures or rhythmic devices. Pattern recognition when composing/performing and analysing music, seeing patterns in music. 	<ul style="list-style-type: none"> Analysing music in performance for decision making. How to play style/focus. Analysing composers, seeing what they have done to aid own composition. Analysing own compositions and performances. Do they work? Sound finished? 	<ul style="list-style-type: none"> Working in groups to support creative design decisions in performance. Solving problems in composition. key changes and modulations. Designing concerts and performances. 	<ul style="list-style-type: none"> Composition creative skills, using Sibelius (notation package) and Ignite software (multi-tracking). DAW software (Digital Audio Workstation) implementation and understanding, instilling creative thinking and creation. Creativity in individual performance. 	<ul style="list-style-type: none"> Safe use of sharing music across the internet. Copyright in composing and performance music.
History	<ul style="list-style-type: none"> Using algorithmic thinking when writing a narrative account, placing events in correct chronological order to reach an outcome. Placing historical events into chronological order (sequencing). Decomposition of themes such as social, political and economic to understand their impact on society for rates of change. Looking at ciphers and coding during Elizabethan England. Pattern recognition analysing patterns of continuity and change. 	<ul style="list-style-type: none"> Analyse primary sources for their usefulness and validity for an enquiry. Considering source content as well as provenance. Evaluate historians' interpretation of past events and formulate an argument to come to an overall judgement. 	<ul style="list-style-type: none"> Look at abstract sources, analysing where the sources come from and the author, then apply its usefulness to the context of the time. Students must be able to apply own knowledge to sources and interpretations to solve big questions. 	<ul style="list-style-type: none"> Creation of presentations on historical findings/information, using appropriate software. 	<ul style="list-style-type: none"> When looking at sources, consider where they come from and how their context may impact their reliability. Using This knowledge to consider evidence in the real world including TikTok's, news articles on Facebook. Safe use of technology employed during the gathering of research whilst using the internet.

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IMedia (ICT)	<ul style="list-style-type: none"> • Decomposition when breaking down strands within coursework (NEA) mark schemes to identify tasks and improvements. • Abstraction when removing unnecessary detail to ascertain important information from set assignments within coursework (NEA). • Algorithmic thinking applied when following the flow of data within Flow charts. • Pattern recognition when creating Mood Boards and Mind Maps during coursework (NEA) and analysis of them when completing exam questions on these pre-production planning documents. 	<ul style="list-style-type: none"> • Review Primary and Secondary sources when analysing exam scenarios and coursework (NEA) set assignments. • Analyse the suitability and properties of digital graphic and other assets when sourcing them. • Explain both the validity and reliability of sources when sourcing for use within coursework (NEA). • Extract the most relevant information from set assignments and exam questions to develop the most effective answers. • Critical thinking when deciding which images are most suitable for Mood Board, as well as deciding what should be include in visualisation diagrams. • Analysis of pre-production documents suitability for both audience and purpose in order to answer 12 mark essay question within examined unit. 	<ul style="list-style-type: none"> • Create a range of design and planning document with creative elements such as mood boards, visualisation diagrams and wire frames diagrams. • Solve problems presented within the set assessment, deciding on what software, hardware and planning documents to create/use. • Create designs required to complete each coursework (NEA) unit. 	<ul style="list-style-type: none"> • Use image editing software to create products required with the coursework (NEA) applying advanced tools. • Use image editing, video editing, sound editing, animation and web development software to create products required with the coursework (NEA) applying advanced tools. • Use a variety of different software to apply creativity to pre-production documents. • Be about to evaluate creative documents, identifying positives, negatives and ways to improve. 	<ul style="list-style-type: none"> • Be able to identify different legislation surrounding assets and data. Understanding intellectual properties, copyright, trademarks, Creative Commons and data protection. • Identify steps on how to avoid breaking legislation surrounding the use of assets and the internet.
Mathematics	<ul style="list-style-type: none"> • Algorithmic thinking following a series of steps (sequencing) to find the solution to a problem, such as when solving equations. • Solving complex mathematical problems using decomposition working on individual parts of a problems before combining them to solve a larger problem. • Make and use connections between different parts of mathematics to solve problems. • Abstraction simplifying problems by removing unnecessary detail and focussing on the maths that can be used to solve a given problem. • Pattern Recognition analysing data to draw conclusions such as cumulative frequency curves and box plots. 	<ul style="list-style-type: none"> • Analysis of data presented to understand and draw conclusions. • Critical thinking when comparing data sets or graphs and drawing conclusions about one over the another. • Reflect on how solutions determined may have been affected by any modelling assumptions made during modelling. • Structure work in such a way that can easily be revisited to identify errors in the steps taken should they occur, such as showing all working, with lines of calculations written under one another. 	<ul style="list-style-type: none"> • Select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems, interpreting their mathematical solution in the context of the problem they are solving. • Problem solving is continually used throughout KS4 mathematics, whereby students are expected to identify a problem and then develop and implement a step-by-step plan to solve said problem. 	<ul style="list-style-type: none"> • Specialist software is used to model and explore mathematical concepts. Students are encouraged to be creative in their use of these software. • Tools for plotting graphs allow students to explore the effect of changing and manipulating variables in equations. • Geogebra software used for modelling and exploring geometric properties allowing students to develop a stronger understanding of these concepts. 	<ul style="list-style-type: none"> • Critical evaluation of data during data and data handling, such as how graphs and charts can be used to convey a chosen point of view. • Students are encouraged to look critically at the source of any information they find online. • Safe use of technology employed during the gathering of information for homework or in lessons.

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Media Studies	<ul style="list-style-type: none"> Using algorithmic thinking to work through design stages using well defined steps to create a composite media product. Decomposition breaking down narratives into main parts. Links to Todorov's narrative theory. Abstraction when using network diagrams and interaction graphs to abstract relationships within media texts (between characters, between producers and audiences etc.) Pattern recognition when comparing of audience engagement trends with different media platforms and their relevance in social and historical contexts. 	<ul style="list-style-type: none"> Close Analysis of semiotics across a variety of media texts across a range of media formats. Exploring the relationship between how institutions encode meanings within media texts and how audiences decode those meanings (reception theory). Evaluation of methods used within media industries to produce, market and exhibit a range of media texts to maximise profit and engagement. 	<ul style="list-style-type: none"> Design and construction of a media product (as their NEA project) based on the requirements of the brief. Problem Solving when research and decide on the best methods to employ to appeal to their target audiences and meet the generic conventions as required by the brief. Evaluation when exploring the conventional design elements used in a variety of genres and how effective it is to either conform to or break conventional design models. 	<ul style="list-style-type: none"> Creative use of software such as photoshop (alongside other online based design tools) to construct a design and manipulate images to create media texts. The use of digital imagery captured by digital devices that will be used during design stages of NEA and other practical tasks. 	<ul style="list-style-type: none"> Exploration of the impacts of over-exposure to online media formats and evaluation of how various countries are dealing with the threat of online addiction (Online Addiction). Develop knowledge and understanding of how a variety of media industries are regulated and the dangers of online media, which is notoriously difficult to monitor (Regulation). Exploration of the various uses and impacts that social media can have for audiences and industries alike (Impacts of Social media).
Religious Studies	<ul style="list-style-type: none"> Algorithmic thinking creating timeline of events for religious figures or events (sequencing). Creating a storyboard or social stories. Step by step guides e.g. Muslim prayer. Decomposition breaking down stories into main parts. Key events that have taken place. Answering big questions e.g. how was the world created? Abstraction when removing unnecessary detail and focussing summarising key findings. Pattern recognition when comparing religious beliefs, teachings and practices, democratic countries versus other forms of government. 	<ul style="list-style-type: none"> Analysing information to make an overall conclusion based on the balance of evidence. Analysis of statistics and data to look for trends and to draw conclusions. Critical thinking using reason to analyse and evaluate. Allowing the opportunity to give opinions, consider alternative arguments, weigh up evidence and listen to and respond to the views of others. Extract the most useful quotations to use as evidence to back up claims. Structure an essay which presents a balanced account of an event and reflects different perspectives. 	<ul style="list-style-type: none"> Analysing case studies and trying to discuss and work out an appropriate moral response. Reading case studies and scenarios, obtaining relevant information and understanding how to deal with problems that arise. 	<ul style="list-style-type: none"> Creativity through, sharing thoughts, expressing opinions, analysing and evaluating beliefs and values for example. These kinds of activities mean that students apply their curiosity and openmindedness, and then use imagination and problem-solving approaches to consider some very complex beliefs and values. 	<ul style="list-style-type: none"> What to do and where to get support to report material or manage issues online. How people can actively communicate and recognise consent from others, including sexual consent, and how and when consent can be withdrawn.

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Physical Education	<ul style="list-style-type: none"> • Algorithmic thinking when creating a warm-up plan. When coaching a session to include the different aims and parts. Information processing model when performing a skill in any sport. • Decomposition when skills are broken down into smaller components in order to refine them. The rules of the sport. What are the requirements of the sport? • Abstraction when removing unnecessary detail when creating fitness Training plans and progression within. • Pattern recognition when developing good technique and movement patterns. Developing tactics and formations. Using statistics taken from a game on performance, such as number of shots on target or possession of the ball. 	<ul style="list-style-type: none"> • Analysis of data such as: <ul style="list-style-type: none"> ○ fitness testing to compare against normative data and interpret what it means. ○ own and others performance in a sporting activity, identifying areas of strengths and areas to improve upon. Using this information to plan for improvement. ○ trends in physical activity participation. ○ recorded from performance, such as number of goals scored. • Critical thinking using reasoning to analyse and evaluate. Allowing the opportunity to give opinions, consider alternative arguments, weigh up evidence and listen to and respond to the views of others. • Extract useful information from scenarios to use for describe and explain questions. • Make a reasoned qualitative judgement considering different factors and using available knowledge/experience to answer exam questions. 	<ul style="list-style-type: none"> • Working in teams to support creative design of tactics and decisions that can affect the outcome in a performance. • Overcoming problems which may arise during a performance, such as the opposition having a strong right winger, how do we overcome that? • Adapting performance to overcome challenges within a game. 	<ul style="list-style-type: none"> • Creating a trampoline or dance routine, using appropriate software. • When a creative performer is facing a problem, they can come up with an answer to that problem that is unexpected by the opponent. Creativity can be shown through a skill, movement or a tactic. • Creating a health and physical activity campaign poster, using appropriate software. 	<ul style="list-style-type: none"> • Discuss the benefits/challenges of using wearable technology. How does technology impact what we see as healthy? • Safe use of technology employed during the gathering of research whilst using the internet. • Look at Sports professionals social media pages and the impact sponsorship and the media has on them.

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Science	<ul style="list-style-type: none"> • Using a series of stages to complete Punnett square diagrams and determine the outcome of genetic crosses (sequencing). • Use of models to describe and explain abstract concepts such as: <ul style="list-style-type: none"> ○ Cell division, movement of substances, enzyme action, negative feedback control, chromosome behaviour during meiosis, models of the atom, electron configuration, ionic compounds, covalent compounds, changes of state, density, particle arrangement. • Recognition of trends in data in required practical results and drawing conclusions from this. • Recognition of trends in activity in period 1 and 7 elements. 	<ul style="list-style-type: none"> • Analysis of trends in data in required practical results and drawing conclusions from this. • Extraction of relevant information from given text and data to draw conclusions and evaluate. • Making reasoned judgements using scientific understanding and source information. 	<ul style="list-style-type: none"> • Planning of experiments to make observations, test a hypothesis, check data or explore phenomena (required practical's). • Work around solving problems with experimental technique and errors. • Problem solving when completing mathematical components of science. When calculating an unknown value(s) in chemistry and physics. 	<ul style="list-style-type: none"> • Creation of animations to model processes in cells, using appropriate software. • Creation of models to show abstract concepts such as cells structures, particle models, electrical circuits and the national grid, using appropriate software. • Design methods to investigate relationships, using appropriate software. • Models of DNA, using models • Models using molymods to make elements and compounds, using appropriate software. 	<ul style="list-style-type: none"> • Safe use of technology employed during the gathering of research whilst using the internet.