Computing Across the Curriculum within Key Stage 4

Subject / Strand	Computational thinking	Analytical Skills	Problem Solving & Design	Cr
Art	• 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.	• 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.	• 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.	• **Creativity** througho ideas gen of materi processes outcome variety of
Business	• 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.	• 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.	• Use **problem solving** to identify the correct finance formulas to correctly calculate finance-based questions. • **Decision making** used when identity impacts of each option when answering justify and evaluate questions.	• **Creativity** generatin gate stoc appropria • Use onlin and e-rev answer c engage t • Students revision r knowledg in the bla appropria • Design ar and prom both prin

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Design Technology	• 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.	• **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.	• 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.	• **Creativity** through • Research explorat technique the creat this using software
Drama	• **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.	• Students analyse own performances and then evaluate the effectiveness. • Analyse professional performances and drama practitioners.	• Working in groups and creating performances. Being creative and making decisions. • Overcoming issues as they arise such as staging, blocking, choreography, and characterisation.	• Using dig backdrop projectio performa • Record ar • The use c effects us lighting d
English	• 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.	• 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.	• 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.	• Creative v descriptic stories, p stimulus software • Encourag imaginati • Using rea imaginati writing. • Inference understa intent of

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Geography	• 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.	• **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.**	• 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.	• **Creation** presentat the stude fieldwork appropria • Creation technique (Graphic connectir • Use of or such as S Geograph Geograph **creating** retrieval
Health and Social Care	• Explain the impacts of actions using a logical chain of **reasoning (sequencing).**	• **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.	• Explain the impacts of actions using a logical chain of **reasoning.**	• Use of **cr** health pr using app
History	• 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.	• 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.	• 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.	• **Creation** of pr historical find using appropr

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Hospitality and Catering	• **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.	• 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.	• 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.	• Creativity skill throughout KS styling from i using digital m • Research, idea exploration of techniques an creation of ou • Use of online tools e.g. digit for creating in and practise.
iMedia	• **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.	• 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.	• 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.	• Use image edi **create** produc coursework (N advanced too • Use image edi sound editing development products requ coursework (N advanced too • Use a variety to apply **creat** production do • Be about to e documents, id negatives and

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Maths	• **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.	• **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.	• 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.	• Specialist soft and **explore** concepts. Stud to be **creative** software. • Tools for plott students to **e** changing and variables in e • software used **exploring** geo allowing stude stronger unde concepts.
Modern Foreign Languages	• **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 .	• **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.	• 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.	• **Creation** of au preparation a speaking tasks final exams, u software. • Use of online tools e.g. Quiz **creating** indiv practise.

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Music	• 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. • **Decompositio**n of rhythms in performance, composition and analysing. • **Abstraction** of music when studying set works stripping away all unnecessary details. Striping away melody and harmony to see chord structures or rhythmic devices. • **Pattern recognition** when composing/performing and analysing music, seeing **patterns** in music.	• **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?	• Working in groups to support **creative design** decisions in performance. • Solving **problems** in composition. key changes and modulations. • **Designing** concerts and performances.	• Composition Sibelius, Note and Bandlab s • DAW softwar Workstation) understanding thinking and c • **Creativity** in i performance manipulating assist in live p
Philosophy and Ethics	• **Algorithmic thinking** creating timeline of events for religious figures or events (**sequencing**). Creating a storyboard or social stories. Step by step guides e.g. The 5 Buddhist Precepts • **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.	• **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.	• **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.	• **Creativity** diagrams track key Week an creation.

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Physical Education	• **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.	• **Analysis** of data such as: ○ 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.	• 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.	• Creating a tra routine, using software. • When a creati a problem, the an answer to unexpected b **Creativity** can skill, moveme • Creating a hea activity campa appropriate s

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Science	• Using a **series of stages** to complete genetic diagrams and determine the outcome of genetic crosses (**sequencing**). • Use of **models** to describe and explain **abstract** concepts such as: ○ 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.	• **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. • **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. • **Evaluating** information and making **reasoned judgements** using scientific understanding and source information.	• **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 biology chemistry and physics.	• Creation of **ar** processes in c appropriate s • Creation of **m** abstract conce structures, pa electrical circu grid, using ap • **Design** metho relationships, software. • **Models** using elements and appropriate s