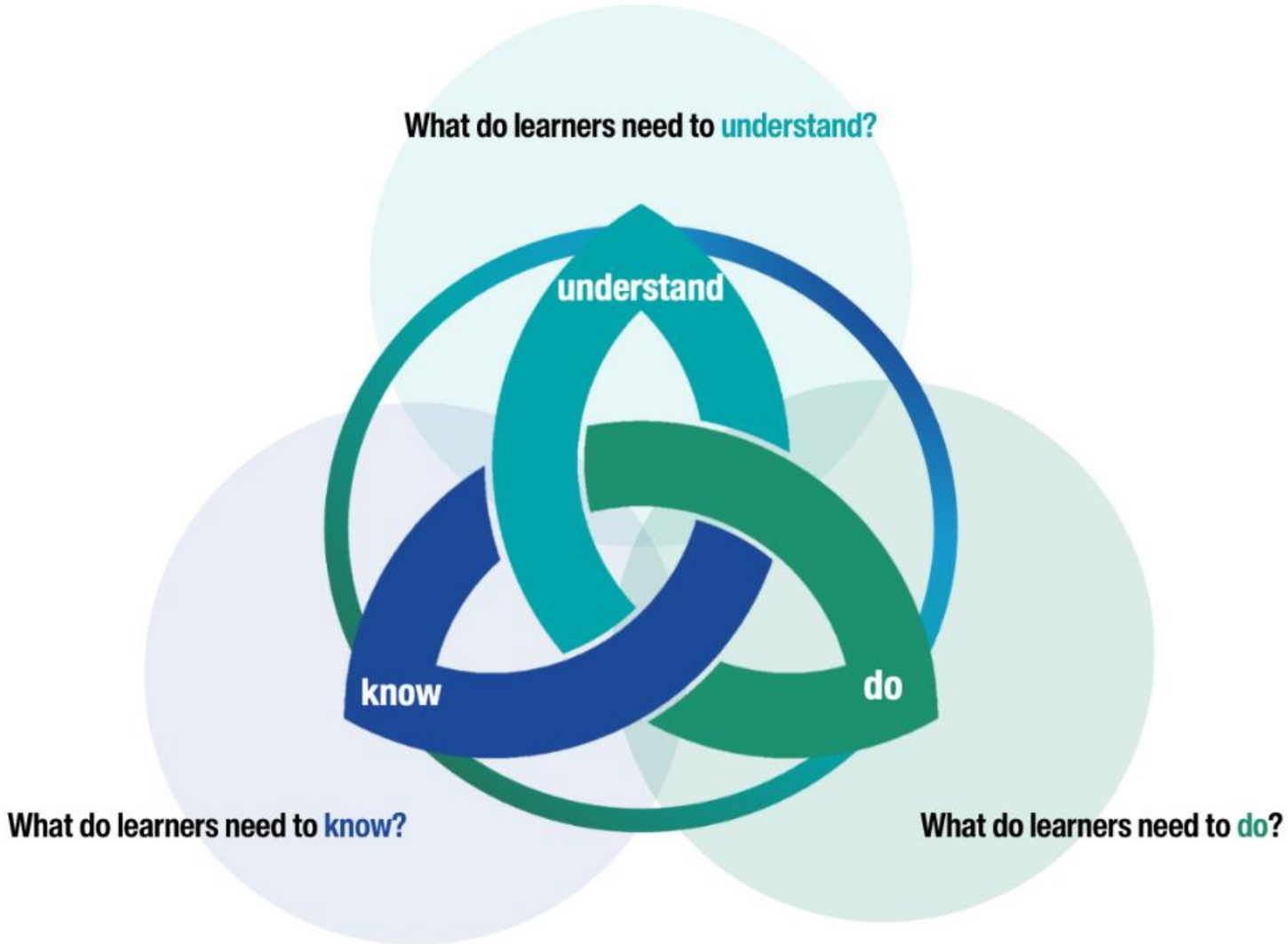
Curriculum Improvement Cycle
Draft Technical Framework
Technologies Sample

June 2026

These are **draft materials**. The content, format and style are subject to change. It would not be appropriate to change current planning or tracking and monitoring systems in establishments at this stage.

There is **no expectation** on educators, schools or settings to do anything now with these samples. They are being shared as part of the co-design process and in advance of engagement and feedback time during the 2026/27 session.


What do learners need to understand?
understand
know
do
What do learners need to know?
What do learners need to do?

<table>
<tr><td colspan="3">Technologies</td></tr>
<tr><td rowspan="2">Illustrative Big Idea</td><td colspan="2">Innovations, design and enterprise in action (IDEAs)</td></tr>
<tr><td colspan="2">Innovation is a continual, iterative process of problem finding, prototyping, testing, and refining. It relies on creativity, curiosity, and resilience through learning from failure and adapting to change. Through design, learners experience how products, services, and solutions are created with purpose, tested, and improved through feedback and iteration. They use creativity and collaboration to identify opportunities, use the techniques and knowledge from Make It Happen to develop and model ideas (whether physical, digital, or business related), and refine them against intended purposes and user needs. This demonstrates that strong solutions emerge not fully formed but through cycles of exploration, analysis, and improvement.</td></tr>
<tr><td>Strand</td><td colspan="2">Thinking for Technology and Innovation</td></tr>
<tr><td>Sub Strand</td><td colspan="2">Technologies</td></tr>
<tr><td rowspan="3">Early Level</td><td colspan="2">Understand: Design ideas can be imagined and explored to change and create new things.</td></tr>
<tr><td>Know:

Design ideas can be expressed through visual and physical representations.

Design ideas do not always work out as planned.</td><td>Do:

Explore materials and experiment with technology.

Retry and experience different outcomes.</td></tr>
<tr><td colspan="2">Notes:

Provide me with a variety of materials to freely explore through play.

Encourage me to use my body and senses to explore the properties of materials and make predictions and comparisons based on my discoveries. For example, does this wooden block, piece of clay, stick, stone or petal feel hard or soft, rough or smooth to the touch, will it stack on top of another, will it stand independently, can I shine a light through it, what does it look like up close via a magnified lens?
Encourage me to explore materials in different types of weather and make comparisons based on my discoveries. For example, wood becomes slippery in the rain or frost to walk on, but is not slippery when it is dry, paper disintegrates in the rain, and lightweight materials may blow away in the wind.

Provide me with materials and technology that enable me to explore natural sunlight and manmade light to recognise reflection, and shadow on solid surfaces/materials and in water. For example; torches, battery operated lights and a range of small and large loose parts; translucent/Perspex, reflective, metallic, transparent, opaque and perforated.

Invite me to further explore my findings of materials and make estimations about their measurements (using early level mathematical language) and provide me with tools that make this interesting. For example, balance and digital scales, talking measuring jugs/spoons, rulers, tape measures, measuring apps, digital measuring wheel and trundle wheel.

Encourage me to investigate what is inside some materials if appropriate, for example provide me with a ‘tinker tray’ and tools such as scissors, screw drivers, tweezers, safety knifes, magnets and magnifying glasses or microscopes to open up, deconstruct and safely look inside things such as twigs, acorns, fruit, cardboard, a torch, broken pieces of technology.

Encourage me to recognise risk when selecting tools, materials, media and technology (link to UNCRC/SIMOA) that may be sharp, hot, heavy, very bright or loud etc, enabling me to develop resilience and recognise when to ask for help.</td></tr>
<tr><td>Sub Strand</td><td colspan="2">Technologies</td></tr>
<tr><td rowspan="3">First Level</td><td colspan="2">Understand: Strategies are used to solve problems.</td></tr>
<tr><td>Know:
Tinkering and trying different approaches is a way to start to solving problems
Listening to others’ ideas can help solve problems
Problem solving strategies can be useful to tackle challenges</td><td>Do:
Imagine and predict how technology might work or be used to solve a problem
Plan how to solve a problem by breaking into main parts and logical steps
Make a model to test the solution
Reflect on whether the solution worked as planned and make changes
Explore alternative solutions</td></tr>
<tr><td colspan="2">Notes:

This strand demonstrates the value of trying to solve problems and challenges - it is complementary to the Making strand within the Technologies curriculum.
Tinkering is a term used to mean playing with technology
Children should have the opportunity to play with physical materials, digital media and the outdoor environment, such as:
- Loose parts
- Block play
- Tools</td></tr>
</table>

	- Puzzles - Games - Devices Problem solving strategies could include - Breaking tasks into smaller, manageable steps so problems or tasks are easier to approach - Identifying the key / main ideas and ignoring unnecessary detail - Organising steps in a clear, logical sequence (first, next, last) - Recognising patterns or similarities that can help apply previous knowledge of experiences to new situations Using appropriate resources and tools, such as Nrich, Bebras, and Code.org, to support thinking and exploration Children should have a balance of agency to explore and imagine, while beginning to practice taught problem solving strategies with purpose.					
Sub-Strand	**Business**		**Computing Science**		**Design Engineering**	
	Understand: Solving problems requires working with others and developing multiple solutions					
Second Level	Know: Innovation and enterprise is about coming up with new ideas and ways of doing things New ideas can be shared with different people to get support, investment or feedback Marketing is a way of letting people know about a product they can buy or an event they can go to Branding helps an organisation/product stand out through elements such as names, logos, and design.	Do: Collaborate with others to solve a problem, generate ideas or meet the requirements of a brief. Make improvements based on comments or feedback Reflect on the activity Present the enterprise idea Respond to questions or the enterprise idea and refine it where appropriate. Identify familiar examples of marketing and branding Experiment with a range of and resources tools (including digital) to design marketing materials	Know: The development of computing solutions follows stages: analysis, design, implementation and testing, Analysis involves identifying the purpose, audience, and requirements of a solution Design of a computing solution includes the data and the processes used to achieve the requirements. Design of user experience involves planning layout, navigation, and interaction Design of coding solutions involves algorithms that include sequence, selection, repetition, and conditions Algorithms define the steps needed to solve a problem and are used during design and implementation Implementation is the process of making the solution using a digital or physical tool Testing checks whether a solution works is fit for purpose A solution is fit for purpose if it meets all the requirements identified at analysis	Do: Gather and explore information to define requirements. Outline the broad requirements of a task. Use design techniques such as diagrams, sketches or algorithms to illustrate the data, processes and user experience. (Making) Build a solution, or part of a solution, based on designs using appropriate tools and features Test a solution for correct behaviour based on the requirements or expectations Explain what works well and suggest improvements	Know: Design involves a range of approaches and activities that explore possibilities, benefits, and limitations. A brief provides information about a scenario, opportunity or situation. Ideation is the process of creating, developing and communicating new ideas or concepts. Critique is an ongoing process of judging an idea to refine it to meet a brief. Testing is used to determine how well a design meets its intended brief. Different testing methods have benefits, drawbacks and limitations.	Do: Follow a strategy to complete design activities. Analyse the brief to outline key points. Gather appropriate information which is relevant to a brief. Identify design constraints from information provided. Conceptualise and communicate ideas to meet a brief. Make physical and digital models to explore and refine ideas. Select a testing method and explain why it appropriate for the scenario. Evidence critique and reflections throughout design activities.

	Notes Enterprise activities can include problem solving and creative initiatives that builds an entrepreneurial mindset. Examples could include: •Coming up with new product or service ideas in response to a brief •Taking part in an enterprise activity or organising a fund-raising event •Taking part in established national enterprise programmes •Project based learning Ideas and solutions can be presented in range of ways such as a business pitch, presentation, verbal or written plan or report		**Notes** Digital solutions are developed through stages (analysis, design, implementation, testing, evaluation) which may be used individually or together, allowing work on complex tasks without full implementation. The process is flexible, with stages combined, omitted where appropriate, or revisited to improve solutions. This applies across programming, app design, physical computing and data/information projects, often involving collaboration and feedback. Design uses informal techniques such as sketching layouts, writing step-by-step instructions, describing interactions, mapping user journeys, annotating ideas, and identifying inputs and outputs. It focuses on both solution behaviour (logic, steps, decisions using sequence, selection, and repetition) and user experience (layout, navigation, clarity). Testing is practical and ongoing, checking functionality and ease of use, with improvements suggested based on results and feedback. Computational thinking underpins this work. Decomposition breaks problems into parts, abstraction focuses on key details, and pattern recognition identifies similarities to simplify solutions. Algorithmic thinking involves creating, following, predicting, debugging, and comparing step-by-step solutions, including evaluating efficiency by steps or time. Algorithms at this level use sequence, selection (TRUE/FALSE conditions), and repetition (fixed or conditional loops). Learners compare approaches, measure efficiency, and engage in activities that involve predicting outcomes, debugging errors, and constructing their own solutions. Algorithms are understood as general step-by-step processes, not just programs, and are applied across computing contexts. Learners should be encouraged to use TRUE/FALSE terminology. Exclusions: formal diagrams (e.g. flowcharts, UML), detailed technical documentation, formal methodologies, and complex branching structures (e.g. IF / ELSE chains).		**Notes** At this level, a strategy is used to help introduce student to different aspects of design activities. As learners progress, this evolves into a non-linear approach. By using an item, or researching similar items, learners can understand it in their own way. A brief is used to identify needs, wants and constraints. The need and/or want for a design is a catalyst for creativity. Research and interrogation of a design can inform learners to understand it in their own way. Design moves back and forth between activities instead of following a linear path. Design is not just drawing or creating a pattern but may include data, modelling or writing. Creating multiple ideas that address the design brief demonstrates creative thinking. Research could be a short survey, a collection of source images, product analysis, measuring items etc. Research considerations could include aesthetics, materials, existing designs. Research boundaries can be provided at this level. Communication can be through physical and digital models, sketches, photographs or written work. A design can be created with a range of media. At this level, the modelling technique can be prescribed. Methodologies may include user experiences, artefact analysis, focus groups, case studies etc. Critique and reflections should appear at all stages and may be recorded in any format appropriate for the task, for example, photographs, videos, voiceovers, screenshots etc.	
Sub-Strand	**Business**		**Computing Science**		**Design Engineering**	
Third Level	**Solutions are created through an iterative process of identifying problems and needs, creating, testing and communicating ideas, which result in an output.**					
	Know: Entrepreneurial thinking is about identifying opportunities to create or improve products, services or processes. Entrepreneurs demonstrate a range of	Do: Collaborate effectively with others to solve an identified problem or respond to a brief within an enterprise activity or event planning context. Organise resources such as	Know: The software development process is iterative and involves revisiting stages based on testing and evaluation Analysis of a problem includes the	Do: Break down a problem and plan using templates or project plans Describe what is possible with available resources, time, and	Know Briefs bring opportunities and constraints to a scenario, opportunity, or situation. Effective analysis involves breaking	Do: Identify design requirements based on the brief and relevant research. Critique existing products, services or systems against criteria.

	skills and qualities that help them innovate and find better, more efficient, or more creative ways to do things. Entrepreneurs will evaluate how well an enterprise has gone and identify areas for improvement. Entrepreneurs share ideas, initiatives, and solutions with others to gain support, or investment. The business plan outlines key aspects of a business idea. The business pitch is a presentation used to share the idea and gather interest. Organisations produce goods and services based on customer characteristics and the customer persona Branding enables an organisation to be recognised in the marketplace Marketing and promotion are used by organisations to attract, persuade, and inform	materials, people, time and equipment to carry out the enterprise activity Make changes to product and/or service plan or processes as needed based on feedback received Evaluate the outcomes of the enterprise activity, identify what worked well and what could be improved. Reflect on the personal skills and qualities developed while taking part in enterprise. Prepare a business plan or pitch for the enterprise idea Consider the use of customer personas to build up a picture of the target market Develop a suitable brand for a product or service in a local context. Develop a promotional strategy used by a variety of organisations, products, and/or target markets.	resources required to create a solution. The process of creating a computing solution can be improved by creating a prototype which models key aspects of the solution which can be improved through feedback before fully implementing. Design of coding solutions involves algorithms that include sequence, branching selection, repetition, and complex conditions. Solutions are created by breaking problems or systems into related parts, simplifying ideas using models, designing logical step by step instructions and recognising patterns that can be reused. Evaluation of software by a user assesses the usability and performance.	understanding. Create prototypes that illustrate process/function and user experience of a computing solution, and improve the design based on feedback Compare alternative design ideas, including algorithms, and justify a choice. (Making) Build a solution, or part of a solution, based on designs using appropriate tools and features Test a solution against pre-determined expectations to determine if it is fit for purpose. Evaluate a computing solution as an end-user	down a situation into different criteria. Existing designs can be used to identify useful features, limitations, and opportunities for improvement. Design ideas can be generated using different approaches and techniques and continually improved through cycles of testing and refinement. Different forms of modelling are used for communicating and testing. Different aspects of a design require different approaches to testing. Critique should be constructive and evidence based.	Follow a strategy to complete design activities acknowledging that activities may be interchanged to achieve optimal outcomes. Conceptualise and communicate idea-generation techniques and use them to produce initial ideas. Document the evolution of a design with evidence of testing and design considerations. Use physical and digital modelling techniques to generate, explore and test ideas.
	Notes Enterprise activities can include problem solving and creative initiatives that builds an entrepreneurial mindset. Examples could include: •Coming up with new product or service ideas in response to a brief •Taking part in an enterprise activity or organising a fund-raising event •Taking part in established national enterprise programmes •Project based learning The business plan or pitch could include details on the good / service or solution, the target market and some of the resources required.		**Notes** The development process is iterative involving analysis, design, implementation, testing, and evaluation. This process is flexible, meaning stages may be completed individually, omitted where appropriate, or revisited to refine solutions. Work can be applied across a range of project types and does not always require full implementation. Design focuses on clearly planning a solution's structure (e.g. pages, screens, data), behaviour (what happens on user input or conditions), presentation (layout, text, visuals), and user interaction (navigation, buttons, prompts). This can be supported using informal techniques such as sketching layouts, mapping user journeys, organising content, describing system behaviour, and creating prototypes. Design should consider both program logic (algorithms, control structures) and user experience (clarity, usability, navigation). Prototypes are used to model key ideas, test important features, and check usability. Testing is ongoing and practical, focusing on functionality (does it work?) and usability (is it clear and easy to use?). Testing may involve created or provided solutions and does not require formal methods but should compare expected and actual outcomes. Feedback from peers or users supports improvement. Success criteria, defined before or during		**Notes** Criteria may include function, performance, market, safety, ergonomics and aesthetics, sustainability etc. Research can form the basis for reasoned design inspiration By using an item or researching similar items learners can understand it in their own way and see ways they can improve it. A timeline can be used to understand the evolution of something. At this level, personal insight is used to understand a design. Design is a non-linear process that involves moving back and forth between activities, requiring adaptability and flexibility. Research could be a short survey, product analysis, source images, measuring items etc. Idea generation techniques can be mood boards, lifestyle boards, biomimicry,	

		development, are used to judge how well a solution meets its purpose. Computational thinking underpins this process. Learners use decomposition to break problems into parts and identify inputs, processes, and outputs, and abstraction to focus on important information through models or representations. Pattern recognition supports identifying similarities in data, behaviour, or processes to simplify solutions. Algorithmic thinking involves designing, comparing, and refining step-by-step solutions. Learners read, trace, predict, debug, and construct algorithms, recognising that some are more efficient or clearer than others. Algorithms at this level include branching (IF / THEN / ELSE) and repetition, with increasing complexity in decision-making. This includes the use of complex conditions with logical operators (AND, OR), where learners identify individual conditions and determine overall TRUE/FALSE outcomes. Repetition may be fixed or conditional, with loops controlled by single or combined conditions (e.g. REPEAT UNTIL score = 10 OR lives = 0). Learners should understand how conditions affect program flow and refine algorithms accordingly.	creative toolkits (kits, building blocks etc) brainstorming, artefact analysis. Design considerations could include function; users; aesthetics, materials; safety. Testing methods can include user experiences, artefact analysis, prototypes, computer simulations, test rigs, surveys, focus groups, case studies. Test rigs can be provided and do not need to be created by the learner. At this level, the modelling technique can be prescribed with opportunities to make decisions

	Business		**Computing Science**		**Design Engineering**	
	Understand: Solutions are created through a structured, iterative process in which problems are researched, ideas are represented and communicated, prototypes are tested, and solutions are refined based on evidence and constraints.					
	Know:	Do:	Know:	Do:	Know:	Do:
Fourth Level	Know: Enterprise and innovation are an ongoing iterative process The entrepreneur will consider the feasibility of their idea Entrepreneurs use available data such as financial performance to consider if the enterprise has reached its outcomes or agreed success criteria. Barriers to becoming an entrepreneur may exist for certain groups Business plans and pitches can be used to secure finance from investors such as banks, shareholders, venture capitalists, government (grants). Customers can be split into segments to support the effectiveness of the marketing function USP highlights what makes a product	Do: Collaborate effectively with others to solve an identified problem or respond to a brief within an enterprise activity or event planning context. Calculate simple costing of a project, event or product to determine pricing strategy and likely profitability. Evaluate the outcomes of the enterprise activity and the effectiveness of decisions made. Investigate barriers to becoming an entrepreneur and identify sources of support for certain groups Prepare a business plan or pitch for an enterprise idea or investment opportunity Anticipate questions from investors and interested parties Identify goods and services targeted towards different customer segments	Know: Constraints such as time, audience, and purpose influence design decisions Design includes modelling system behaviour, user interaction, and data structure Implementation can be undertaken as part of a team, where each developer must coordinate with each other Algorithms are developed through stepwise refinement to increase detail and accuracy Testing a complete solution is a planned and structured activity Design of coding solutions involves algorithms that include sequence,	Do: Apply an iterative development process collaboratively Analyse research findings to justify design decisions and prioritise features Produce a detailed design plan that anticipates user needs and constraints. Represent data and processes using recognised design techniques. Refine sub-processes from a top-level design (Making) Build solutions that follow the planned design and structure Create a test plan for a complete solution	Know: Designers must consider constraints that apply to any proposal made. Methodologies are used to ensure research is impartial and objective. Iterative design is non-linear; designers may return to earlier stages based on testing and feedback. Different forms of modelling offer a range of benefits when designing and are selected based on their purpose such as communication or testing. Existing designs can be analysed using design methodologies to identify useful features, limitations, and opportunities for improvement. User testing provides subjective data, whilst technical testing provides	Do: Demonstrate and use established methodologies to undertake research and analysis. Plan a strategy to complete design activities. Employ different forms of physical and digital modelling (sketch, scale, block, CAD) and justify, with evidence, why that model type is suitable for the purpose. Apply and justify test results and feedback to improve and refine their ideas. Assess the success of a design against given design criteria, justifying the findings and recommending improvements. Critique an existing product utilising

	different from competitors and can influence customers choice.	Develop and/or evaluate a marketing strategy used by an organisation towards their target market	nested selection and repetition constructs. Evaluation of software by a developer assesses the efficiency, robustness, and readability (white box)	Evaluate a computing solution as a part of the development team Apply success criteria to evaluate a solution design including usability and suitability.	objective data. Critique is about judging a design based on evidence, data or testing.	design methodology suggesting improvements.
	Notes Feasibility can include costing or breakeven analysis of the activity. Calculating the total costs involved. Taking into consideration the impact external factors or other constraints may have on the idea. Entrepreneurship plays a role in enabling individuals from marginalised groups to overcome social and economic barriers, build wealth, and create community change in their communities. People from marginalised backgrounds often face barriers to becoming entrepreneurs.		**Notes** The development process is utilised across a range of computing projects, using stages explicitly: analysis, design, implementation, testing, and evaluation, while working iteratively by revisiting stages to refine solutions based on feedback and evidence. Analysis involves structured research to define problems, identify requirements, constraints, risks, and success criteria. Design plans the solution's structure, behaviour, presentation, and user interaction, modelling workflows and user experience through sketches, prototypes, and representations. It incorporates algorithm design, including stepwise refinement from high-level ideas to detailed instructions. Implementation involves building solutions aligned with designs using appropriate tools and constructs. Testing is both continuous and planned, focusing on functionality, usability, and reliability, and may include both learner-created and provided solutions. Evaluation uses predefined success criteria and evidence such as test results and user feedback to judge effectiveness and identify improvements. Computational thinking supports this throughout. Decomposition breaks problems into interrelated components and prioritises them; abstraction represents systems at a high level; and pattern recognition identifies trends in data, behaviour, or processes to inform decisions. Algorithmic thinking focuses on designing and refining multi-level solutions using branching, repetition, nesting, and complex conditions, and evaluating them for correctness and efficiency. Algorithms at this level include stepwise refinement, nested structures, and multi-branch selection (IF / ELSE IF / ELSE). Learners read, trace, predict, debug, and construct algorithms involving combined conditions (AND, OR, NOT), recognising how this affects TRUE/FALSE outcomes and control flow. They identify and fix errors such as incorrect branching, misuse of logical operators, and faults in nested structures, while designing algorithms that incorporate multiple levels of decision-making and repetition.		**Notes** Design constraints may include function, performance, market, safety, ergonomics and aesthetics, sustainability. The outcome could be a presentation, report or digital submission of research. Methodologies can be user experiences, artefact analysis, focus groups, case studies, mood-boards; user trials; questionnaires etc. Design decisions are influenced by multiple factors, and improving one aspect can impact another. This uses structured methodologies to understand a design. Conceptualise and communicate how changing one aspect of a design impacts other considerations and justify the design choice (e.g. safety versus cost). A strategy can be communicated verbally, visually, or in written form and might include timelines; desired outcomes; objectives; methodologies etc. and must be justified against a determined criteria. Communicating can be through a range of approaches including verbal, visual, models, written etc. At this level the learner should select and use appropriate modelling techniques. Learner's own designs, or existing items, can be critiqued. Evaluation is about judging a design based on evidence, data or testing, and results in recommendations for improvement. Evidence can also be drawn from prior research and should be tangible. User testing provides subjective data, whilst technical testing provides objective data.	

Version History

Version	Date	Detail
Version 1	23 June 2026	First released