In line with our whole school curriculum intent, our aims are to ensure that all students experience a wide breath of study and develop long-term memory of their learning. Every child has the right to a curriculum that champions excellence, supporting pupils in achieving their very best. Computing has deep links across both core and foundation subjects, and Christ Church makes it a priority to embed the subject throughout the curriculum, as well as in the day-to-day life of our school.

- To ensure that every pupil develops the necessary skills and knowledge base to competently and confidently access and use computing throughout the curriculum, with relation to their age and stage of development.
- To encourage, assist and support staff in feeling confident about their ability to deliver all aspects of the Computing Curriculum, and to use computing to support aspects of their professional work.
- To develop continuity of hardware and software provision throughout the key stages.
- To identify and supply adequate hardware and software provision, so that computing can become a part of every classroom, every day.
- To incorporate new computing developments into both the Computing Curriculum and as teaching tools throughout the wider curriculum.
- To ensure children have equal opportunity to access computing provision and the curriculum regardless of race, gender or educational needs.

Implementation:

1. Curriculum drivers (the Arts and Possibilities) shape our curriculum breadth in computing. They are derived from an exploration of the backgrounds of our students, our beliefs about high quality education and our values. They are used to ensure we give our students appropriate and ambitious curriculum opportunities.
2. Cultural capital gives our students the vital background knowledge required to be informed and thoughtful members of our community who understand and believe in British values.
3. Curriculum breadth is shaped by our curriculum drivers, cultural capital, subject topics and our ambition for students to study the best of what has been thought and said by many generations of academics and scholars.
4. Our curriculum distinguishes between subject topics and 'threshold concepts'. Subject topics are the specific aspects of subjects that are studied.
5. **Threshold concepts** tie together the subject topics into meaningful schema. The same concepts are explored in a wide breadth of topics. Through this 're-visiting' of the curriculum, students return to the same concepts over and over and gradually build understanding of them. In Science, these threshold concepts are;**.**
6. **Knowledge categories:** These categories help students to relate each topic to previously studied topics and to form strong, meaningful schema. In computing these knowledge categories include: **code, connect, communicate and collect.**
7. **Milestones:** For each of the threshold concepts three Milestones, each of which includes the procedural and Knowledge categories in each subject give students a way of expressing their understanding of the threshold concepts. Milestone 1 is taught across Years 1 and 2, milestone 2 is taught across Year 3 and 4 and milestone 3 is taught across Year 5 and Year 6
8. **Cognitive Domains:** Within each Milestone, students gradually progress in their procedural fluency and semantic strength through three cognitive domains: basic, advancing and deep. The goal for students is to display sustained mastery at the 'advancing' stage of understanding by the end of each milestone and for the most able to have a greater depth of understanding at the 'deep' stage.

Progression through the Cognitive Domains

Basic	Advancing	Deep
Acquiring knowledge.	Applying knowledge.	Reasoning with knowledge.
Knowledge is explicit and unconnected.	Knowledge is explicit and connected.	Knowledge is connected and tacit.
Relying on working memory.	Drawing on long-term memory, freeing working memory to consider application.	Relies on long-term memory, freeing working memory to be inventive.
Procedures processed one at a time with conscious effort.	Procedures being automatic.	Automatic recall of procedures.
Understands only in the context in which the materials are presented.	Sees underlying concepts between familiar contexts.	Uses conceptual understanding in unfamiliar situations.
New information does not readily stick. Schemes are limited.	New information is linked to prior knowledge. Schemas are strong.	Readily assimilates new information into rapidly expanding schemas.
Struggles to search for problem solutions. Relies on means-end analysis.	Combines searching for problem solutions with means-end analysis.	Draws on a vast store of problem solutions.
Requires explicit instructions and models.	Uses models effectively.	Prefers discovery approaches to learning.

9. **Key vocabulary -** move the learning from basic to deep and show progression through the milestones.
10. **Pedagogical Content Knowledge and Strategies:** As part of our progression model we use a different pedagogical style in each of the cognitive domains of basic, advancing and deep. This is based on the research of Sweller, Kirschner and Rosenshine who argue to direct instruction in the early stages of learning and discovery based approaches later. We use direct instruction in the basic domain and problem based discovery in the deep domain. This is called the reversal effect.
11. Also as part of our progression model we use POP tasks (Proof of Progress) which shows our curriculum expectations in each cognitive domain.
12. Our curriculum design is based on evidence from cognitive science; three main principles underpin it:
    - Learning is most effective with spaced repetition.
    - Interleaving helps pupils to discriminate between topics and aids long-term retention.
    - Retrieval of previously learned content is frequent and regular, which increases both storage and retrieval strength.
13. In addition to the three principles we also understand that learning is invisible in the short-term and that sustained mastery takes time.
14. Our content is subject specific. We make intra-curricular links to strengthen schema.
15. Continuous provision, in the form of daily routines, replaces the teaching of some aspects of the curriculum and, in other cases, provides retrieval practice for previously learned content.

Milestone 1 Key Stage 1	Milestone 2 Lower Key Stage 2	Milestone 3 Upper Key Stage 2
Code		
Control motion by specifying the number of steps to travel, direction and turn.	Use specified screen coordinates to control movement.	Use IF conditions for movements. Specify types of rotation giving the number of degrees.

Add text string, show and hide objects and change the features of an object. Select sounds and control when they are heard, their duration and volume. Control when drawings appear and set the pen colour, size and shape. Specify user inputs (such as clicks) to control events. Specify the nature of events (such as a single event or a loop). Create conditions for actions by waiting for a user input (such as responses to questions like: what is your name?).	Set the appearance of objects and create sequences of changes. Create and edit sounds. Control when they are heard, their volume, duration and rests. Control the shade of pens. Specify conditions to trigger events. Use IF THEN conditions to control events or objects. Create conditions for actions by sensing proximity or by waiting for a user input (such as proximity to a specified colour or a line or responses to questions. Use variables to store a value. • Use the functions define, set, change, show and hide to control the variables. Use the Reporter operators () + () () - () () * () () / () to perform calculations.	Change the position of objects between screen layers (send to back, bring to front). Upload sounds from a file and edit them. Add effects such as fade in and out and control their implementation. Combine the use of pens with movement to create interesting effects. Set events to control other events by 'broadcasting' information as a trigger. Use IF THEN ELSE conditions to control events or objects. Use a range sensing tools (including proximity, user inputs, loudness and mouse position) to control events or actions. Use lists to create a set of variables. Use the Boolean operators () < () () = () () > () ()and() ()or() Not() to define conditions. • Use the Reporter operators () + () () - () () * () () / () to perform calculations. Pick Random () to () Join () () Letter () of () Length of () () Mod () This reports the remainder after a division calculation Round () () of ().

Connect		
Participate in class social media accounts. Understand online risks and the age rules for sites.	Contribute to blogs that are moderated by teachers. • Give examples of the risks posed by online communications. • Understand the term 'copyright'. • Understand that comments made online that are hurtful or offensive are the same as bullying. • Understand how online services work.	Collaborate with others online on sites approved and moderated by teachers. • Give examples of the risks of online communities and demonstrate knowledge of how to minimise risk and report problems. • Understand and demonstrate knowledge that it is illegal to download copyrighted material, including music or games, without express written permission, from the copyright holder. • Understand the effect of online comments and show responsibility and sensitivity when online. • Understand how simple networks are set up and used.
Communicate		
Use a range of applications and devices in order to communicate ideas, work and messages.	Use some of the advanced features of applications and devices in order to communicate ideas, work or messages professionally.	Choose the most suitable applications and devices for the purposes of communication. Use many of the advanced features in order to create high quality, professional or efficient communications.
Collect		
Use simple databases to record information in areas across the curriculum.	Devise and construct databases using applications designed for this purpose in areas across the curriculum.	Select appropriate applications to devise, construct and manipulate data and present it in an effective and professional manner.
Key Vocabulary Progression		

Progression in Computing Vocabulary		
Milestone 1 Key Stage 1	Milestone 2 Lower Key Stage 2	Milestone 3 Upper Key Stage 2
Tier 2 vocab- Key vocabulary.		
Year 1 Vocabulary **1.1 Alert, avatar, button, device, file name, filter, home screen, icon, login, log out, menu, my work area, notification, password, private, Purple Mash Tools, saving, search, shared folder, textbox, think about box, topic area, tool bar, typing and writing template** **1.2 Activities, criteria, describe, equal, groups, less than, more than and sort** **1.3 Collect data, compare, data, pictogram, record results, title, totals and visual** **1.4 Algorithm, code, computer, debugging, instructions, machine, program, recipe and sequence** **1.5 Algorithm, challenge, command, delete, direction, instruction, left and right, route, undo and unit** **1.6 Animation, background, category, clip-art gallery, copy, drop down menu, e-book, edit, eraser, features, font, sound, overwrite, paint tools, paste,**	**Year 3 Vocabulary** **3.1 action, alert, algorithm, background, bug, button, click events, code, collision detection event, command, debug/debugging, degrees, event, flowchart, implement, input, interval, nest, object, predict, properties, repeat, right-angle, run, scene, sequence, test, timer and turtle object** **3.2 appropriate, blog, inappropriate, internet, password, personal information, permission, reliable source, reputable source, spoof, verify, vlogs and website** **3.3 advanced mode, bar graph, cell address, data, equals, less than, more than, more than, less than & equal tool, pie chart, quiz tool, spinner tool and table** **3.4 keys, posture, spacebar and typing** **3.5 address book, attachment, BCC- blind carbon copy, CC- carbon copy, communication, compose, email, inbox, link, mind mapping, node, password, personal information, save to draft and trusted contact** **3.6 binary tree, branching database, data, database and debugging** **3.7 advantages, analysis, decision, disadvantages, evaluation, modelling, point-of-view, realistic, simulation, solution and unrealistic**	**Graph, interpret, generalise, argue the statement, demonstrate, present, adapt, explain patterns, continuous variables.**

play mode, redo, save, sound effect, text, undo and voice recording

1.7 Action, algorithm, background, click, code, code blocks, coding, code view, command, debug/debugging, design view, event, execute, instruction, object, output, plan, programmer, properties, run, scale, scene, software, sound and when clicked

1.8 Button, calculations, cell, clip-art, column, count tool, data, delete, image, lock cell, move cell, row, select, speak tool, spreadsheet and value

1.9 Computer and technology

Year 2 Vocabulary

2.1 action, algorithm, background, bug, button, click events, collision detection action, collision detection event, command, debug/debugging, event, execute, image, implement, instructions, interaction, interval, object, object name, output, predict, properties, run, scale, scene, sequence, test, text, timer, turtle object, when clicked, when key event and when swiped event

2.2 attachment, digital footprint, display board, email, filter, identifying, internet, personal information, private information, protection, reply, search ,secure and sharing

2.3 addition, block graph, cell, coins, column, copy, count tool, cut, data, drag, equals, equals tool, image value, label, paste, price, row, speak tool, table, toolbox and total

2.4 avatar, binary tree, data, database, field, information, pictogram, question, record, search and sort

3.8 axis, chart, column, data, graph, investigation, row, sorting, survey, tally chart and title

3.9 animation, audio, border properties, duration, editing, fill colour, font formatting, layer, media, presentation, presentation design, preview, review, slide slideshow, sound effect, textbox, theme, timing, transition, video and word art

Year 4 Vocabulary

4.1 action, alert, algorithm, background, button,

2.5 browser, device, digital footprint, domain, internet, network, search engine, URL, web address, web page, web site and world wide web **2.6** art, clip-art, diagonal, dilute, eCollage, fill, horizontal, impressionism, line, palette, parallel, pointillism, repeating pattern, rotated, stamps, style, surrealism, symmetry and vertical **2.7** bars, beat, compose, note, tune, repeat, sound effect, soundtrack, speed, tempo and volume **2.8** e-book, fact file, fiction, mind map, multiple-choice, node, non-fiction, presentation and quiz **Suggest, create, diagnose, modify, devise, prove, contrast, evidence, reason and justify**.		