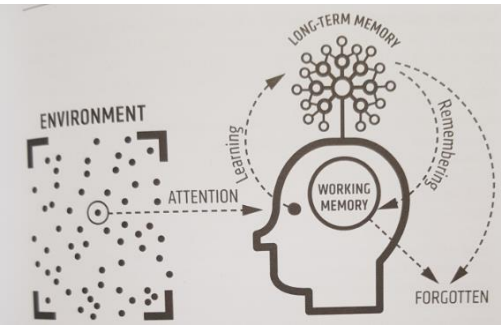
Computing Curriculum Delivery Document

Intent	We have created a comprehensive progression document for staff to follow to best embed and cover every element of the computing curriculum. The knowledge/skills statements build year on year to deepen the understanding of our learners. All staff are aware of their year group expectations, and what comes prior/next in order to maximise pupil progress. In order to reduce teacher workload for non-specialist staff, we use the 'Twinkl' unit of work from Year 1 to Year 6 to meet the aims of the National Curriculum in the form of a long-term plan as well as planned iPad sessions that expand learners knowledge. In addition to the core teaching of computing skills, further opportunities to utilise technology are carefully planned into the wider curriculum to ensure children recognise how technology can enhance their schooling e.g. using word-processing in English, using spreadsheets in science and using online platforms to record, and reflect upon, their work. To provide early experiences of technology, children within the Early Years Foundation stage are provided with opportunities to handle technology purposefully such as using BeeBots and walkie talkies as an early opportunity for programming and the iPads/interactive whiteboard to capture and display their learning. As children progress into Key Stage 1, weekly lessons are timetabled which allow children to explore the computing curriculum from the 'Twinkl' unit of work. This introduces them to a more formal approach to the curriculum that introduces them to the three strands of computing: digital literacy, computer science and information technology.
Implementation	At Ash Grove Academy, we feel the majority of computing should be embedded across the curriculum. We endeavour to have timetabled an explicit Computing session each week, however knowing how packed a weekly timetable can be, this approach will allow for flexibility in the timetable. Each week, we aim to provide, an 'Explicit Computer Science' lesson or 'A Tinkering Session'. The computer science part of the computing curriculum will often, but not always, need a more explicit approach, but that is not to say it can't be embedded across the curriculum. A 'tinkering session' looks at introducing a new app or tool and giving children opportunity to experiment and familiarise themselves with the different elements and tools before it can be applied in a more focused approach across the curriculum. For example: If a class were covering World War 2 in Year 6 and exploring how the Second World War started, I could set the children the task of creating a video explaining this. First, the children may want to research some more information about how the Nazi party rose to power. This would involve covering some Digital Literacy: Managing Online Information: - • I can use search technologies effectively. • I can explain how search engines work and how results are selected and ranked. • I can demonstrate the strategies I would apply to be discerning in evaluating digital content. • I can describe how some online information can be opinion and can offer examples. If the pupils were to then create a video using an app such as Adobe Spark Video to demonstrate their learning, they would be covering some of the Information Technology: Video Creation - • I can create videos using a range of media - green screen, animations, film and image. If the pupils were to then upload or publish their work on a blog or platform such as Seesaw, we would also be covering this objective from Information Technology: Word Processing objectives - • I can publish my documents online regularly and discuss the audience and purpose of my content. Even though this would be a History lesson, we would be covering a fair few computing objectives therefore if we need to spend more time on other subjects that week, we are still covering computing without having a timetabled computing session. This is the way we want computing delivered in our school, embedded to allow learning to be more accessible and allow learners to be more creative in demonstrating their learning.
Impact	We encourage our children to enjoy the curriculum we deliver. We want learners to appreciate the impact computing has on their learning, development and well-being. Finding the right balance with technology is key to an effective education and a healthy life-style. At Ash Grove, we feel the way we implement computing helps children realise the need for the right balance and one they can continue to build on in their next stage of education and beyond. We encourage regular discussions between staff and pupils to best embed and understand this. The way pupils share and publish their work will best show the impact of our curriculum. We also look for evidence through reviewing pupil's knowledge and skills digitally through Seesaw and observing learning regularly. Progress of our computing curriculum is demonstrated through outcomes.

How do we ensure that knowledge gained is transferred from working memory into long term memory?

Staff in school have based their strategies on Rosenshine's principles in action (bridging research and classroom practice:



What do our lessons look like			
Introduction	**Teaching input**	**Pupil activity**	**Ongoing assessment**
Daily review	**Present new materials using small steps**	**Guide student practice**	**Ask questions**
	Provide models	**Obtain a high success rate**	**Check for student understanding**
	Provide scaffolds for difficult tasks	**Provide scaffolds for difficult tasks**	**Weekly and Monthly Review**
		Independent practice	

Strategies identified	What do we expect to see in our Computing lessons?
Daily review	Academic or subject vocabulary that has been taught will be modelled throughout daily teaching and contact time, in both computing and wider curriculum lessons.
Present new materials using small steps	Short term planning activities break all material down into achievable, repeatable steps to build children's confidence, competence and retention.
Ask questions	Questions help students practice new information and connect new material to their prior learning. The teacher would question children around the specific knowledge and vocabulary they have been using in this and other modules.
Provide models	Expert teachers / peer models identified in the learning would exemplify the specific skills / knowledge required for the task. Where teachers are not confident to provide expert models, this is looked at in the regular Computing subject skills audit organised by the Computing leader.
Guide student practice	Successful teachers spend more time guiding students' practice of new material. It will be forgotten unless time is given for rehearsal. We revisit computing knowledge in the three domains over and over again, allowing children lots of chance to practice. This is always guided and supported by expert teaching. This leads into opportunities to apply in other subjects (for example English, maths, geography etc) both within school.
Check for student understanding	Checking understanding at each point can help students learn the material with few errors. We would expect to see tasks / skills broken down into very small chunks, with regular assessment checking from teachers throughout.
Obtain a high success rate	In computing, we would expect to see that a skill is successfully taught before moving on. For example, if teaching algorithmic knowledge at year 2, we would expect that children could give complex instructions using half and quarter turns, before moving onto another skill. We take our time to achieve consistent success.
Provide scaffolds for difficult tasks	The teacher provides students with temporary supports and scaffolds to assist them when they learn difficult tasks. So, for example, children may progress from high levels of adult support and resourcing to them becoming more proficient to independently perform tasks within computer science, information technology and digital literacy.
Independent practice	Students should have the opportunity to practice regularly and independently to transfer the knowledge into their long term memory. In computing lessons, there is opportunity for this. Further, we ensure that the appropriate equipment is available throughout the wider curriculum for children to utilise their computing skills in horizontally linked subjects.
Weekly and Monthly Review	Students need to be involved in extensive practice in order to develop well connected and automatic knowledge. Weekly reviews can take place in computing lessons, where teachers return to knowledge learned in a previous unit, and following a period of forgetfulness the children use that knowledge again. Monthly reviews are planned in by the class teacher, where children undertake a task using knowledge from a previous unit after a month.

Computing overview (Delivering: Computer Science 50%; Information Technology 25%; Digital literacy (safety) 25%)

Detail of the units can be found in the planning folder – we revisit the same topic areas each year across a key stage; the lessons are progressively planned increasing independence and depth. Please see the lesson planning folders for detail.

Year A

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1/2	Paint – Making Christmas cards using paint – Can you publish your card and write a message?		Botley the Robot/ Daisy Dinosaur (Tinker then Teach) LO: To understand algorithms – De Bug simple programs (How can we rescue …) Introduce Online safety rules		Augmented Reality – Leo AR (iPad) Make a fact file about a plant (can the plant talk about all its features?) Online Safety	
Years 3/4	Leo AR – Animate an object or person using speech and movement		Book Creator – Create and illustrate your own book using book creator		Scratch – Design and move a character, add sound, fix bugs in their code	
Years 5/6	Adobe Spark Video - Can you make a movie\about a topic area		Scratch – Developing a game (planning in folder)		Sketch – Up – Follow planning and smart books from the sketch up planning (Year 5 folders)	

Year B

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1/2	Paint – Making Christmas cards using paint – Can you publish your card and write a message?		Bee Bot (I pads) - Daisy Dinosaur Microsoft Word – Collect data for Bar charts		Research topic - Can you create notes on your chosen topic ad create a fact file Book Creator – Create and illustrate your own book using book creator	
Years 3/4	Scratch – Using coordinates to control movement Add sounds – time response to speech Use if and then buttons Sensing the edge of a screen		Adobe Spark Video (I Movie) - discuss and research a topic - make a movie		Leo AR – Augmented Reality	
Years 5/6	Scratch – Whack a mole – Programming (Tinker and Teach) https://projects.raspberrypi.org/en/projects/catch-the-dots		Create a website using adobe page – could you entice tourists to visit a location of your choice?		Digital Literacy – Create a virtual year book Create a film – (green screen)	

Knowledge Progression overview

This shows that our coherently and logically planned learning programmes cover the full range of progressive knowledge needed to be successful in computing.

Knowledge Progression grid (shows expected knowledge in each area)	Units taught Year A Year B	Y1	Y2	Y3	Y4	Y5	Y6
Computer Science		Botley the Robot/ Daisy Dinosaur (Tinker then Teach) LO: To understand algorithms – De Bug simple programs (How can we rescue …) Bee Bot (I pads) - Daisy Dinosaur		Scratch - Design and move a character, add sound, fix bugs in their code		Scratch – Whack a mole – Programming (Tinker and Teach) https://projects.raspberrypi.org/en/projects/catch-the-dots Scratch – Developing a game (planning in folder) Sketch – Up – Follow planning and smart books from the sketch up planning (Year 5 folders)	
Information Technology		Microsoft Word – Collect data for Bar charts Research topic - Can you create notes on your chosen topic ad create a fact file Book Creator – Create and illustrate your own book using book creator		Book Creator – Create and illustrate your own book using book creator		Create a website using adobe page – could you entice tourists to visit a location of your choice?	
Digital Literacy		Augmented Reality – Leo AR (iPad) Make a fact file about a plant (can the plant talk about all its features?) Digital		Adobe Spark Video (I Movie) – discuss and research a topic – make a movie Leo AR – Animate an object or person using speech and movement		Digital Literacy – Create a virtual year book Create a film (green screen)	

Vocabulary progression

We identify at the common academic vocabulary that children will need in order to full develop depth of understanding in the chosen subject (Computing). We find that many of these are common to all or some subjects.

Group 1	Analyse	Data	Estimate	Identify	Respond	Concept	Define	Structure	Area
	Consist	Derive	Export	Indicate	Principle	Section	Assess	Constitute	Factor
	Individual	Sector	Vary	Context	Interpret	Method	Process	Formula	Occur
	Create	Establish	Function	Research	Source				
Group 2	Category	Resource	Acquire	Obtain	Text	Construct	Participate	Range	evaluate
	Transfer	Appropriate	Complex	Feature	Select	Compute	Relevant	Conclude	design
	Maintain	Strategy							
Group 3	Alternative	Sequence	Technique	Criteria	Technology	Comment	Interact	Shift	Demonstrate
	Specify	Component	Document	Illustrate	Link	Task	Locate	Scheme	
Group 4	Access	Code	Predict	Sum	Option	Summary	Communicate	Output	Series
	Statistic	Implement	Label	Contrast	Error				
Group 5	Image	Modify	Trend	Adjust	Style	Amend	Logic	Symbol	Generate
	Target	Perspective							
Group 6	Input	Domain	Edit	Interval	Allocate	Enhance	Assign	Attach	
Group 7	Extract	File	Mode	Convert	Insert	Transmit			
Group 8	Minimise	Virtual	Detect	Restore	Guideline	Revise			
Group 9	Format	Overlap	Compatible	Distort	Preliminary	Integral			
Group 10	Collapse								

We then identify the **subject specific vocabulary (Computing)** that children will need in order to be able to develop depth in specific aspects of the knowledge progressions. Children need to progressively retain and build on this knowledge:

Knowledge Progression	Y1	Y2	Y3	Y4	Y5	Y6
Computer Science knowledge progression grid	algorithms; implemented; programs; digital devices; programs; execute; precise; unambiguous; instructions; logical reasoning; predict; behaviour; simple		Designing; writing; debugging; programs; accomplish; specific goals; controlling; simulating; physical; systems; solving problems; decomposing; sequence; selection; repetition; variables; various; forms; input; output; logical reasoning; simple algorithms; detect; correct;			
Information Technology knowledge progression grid	technology; purposefully; create; organise; store; manipulate; retrieve; information		networks; internet; services; world wide web; communication; collaboration; search technologies; results; ranked; discerning; evaluating; digital content; selecting; using; combining; digital services; design; create; programs; systems; content; accomplish; goals; collecting; analysing; evaluating; presenting data; information			
Digital Literacy (Safety) Knowledge progression grid	technology ; safely; respectfully; personal information; private; concerns; content; contact; internet; online technologies		technology; safely; respectfully; responsibly; recognise; acceptable; unacceptable; behaviour; range; report; concerns; content; contact			

Assessment and work recording strategies

Assessment is regular, and ongoing. It is a part of the learning process. It is not onerous and does not generate additional paperwork or workload for teachers. It is used to identify next steps for learning, to identify gaps and provide support and challenge where appropriate, ensuring the children are always prepared for their current and next stage of learning. Strategies for this are detailed in our 10 methods for moving knowledge from working to long term memory.

Collection of work: Children upload their outcomes where appropriate to the "See Saw" collection system. This enables subject leaders to review the work for each class, checking against the appropriate knowledge progression and planning documentation. In hand with pupil voice, this enables us to see how pupils are knowing more, remembering more and that knowledge is revisited on a regular basis.

Frequently asked questions about Computing

1) How does prior content prepare pupils for current learning?
    a. *Computing is broken into three domains: Computer Science; information technology; digital literacy. These are revisited every year, with lessons that build on previously taught skills, knowledge and vocabulary.*
    b. *Teachers work from a progressive plan of academic and subject specific vocabulary to ensure children acquire the vocabulary they need to succeed.*
2) What should pupils already know, and does this build on it?
    a. *See the academic and subject vocab, and the progression of knowledge grids.*
3) Are content choices and activities appropriate for the subject?
    a. *Lesson structure and delivery is planned around Rosenshine's research (10 step model see above)*
    b. *Content is planned to relate to knowledge progressions and the national curriculum.*
4) Does assessment check that the necessary components are learned, and how do you respond to what assessment is telling you?
    a. *Assessment is in built into the lesson – allows teachers to easily implement next steps and challenge for differing outcomes*
    b. *Assessment without levels – measuring every child's progress.*
5) How do you ensure your subject staff have the expertise to deliver your curriculum, and what support is there for non-specialists?
    a. *We deliberately target NQT and inexperienced staff with additional CPD and coaching sessions when designing our curriculum – this is planned around a regular audit. The Computing leader audits staff needs annually, and works with the CPD providers to ensure it meets staff needs and any needs identified in monitoring.*