Computing at Abbots Green Academy
INTENT

Intent

At Abbots Green, it is our intention that computing opportunities will enhance their learning throughout their time in school and beyond.

We use the National Curriculum 2014 and the Early Years Foundation Stage Early Learning Goals to plan our curriculum. The use of information and communication technology (ICT) is an integral part of the national curriculum and is a key skill for everyday life. A high-quality computing education allows pupils to be aspirational learners, building on their skills each year to ensure a solid grounding for future learning and beyond. Pupils at Abbots Green Academy will gain key knowledge and skills in the three main areas of the computing curriculum: computer science (programming and understanding how digital systems work), information technology (using computer systems to store, retrieve and send information) and digital literacy (evaluating digital content and using technology safely and respectfully). E-safety is a fundamental element of computing teaching and technology use at Abbots Green. Children are taught to be bold in their beliefs when using the internet and taking photographs to decide what is right and wrong.

Aims of teaching Computing:

Intent

- Children will understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions

- Children will create and debug simple programs

- To use logical reasoning to predict the behaviour of simple programs

- To use technology purposefully to create, organise, store, manipulate and retrieve digital content

- To recognise common uses of information technology beyond school

- To use technology safely and respectfully, keeping personal information private, identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

Three significant evidence-informed components underpin our ambition at Abbots Green: cognitive load theory, principles of instruction and tasks that support pupils to generate learning and make sense of the content. These are realised in the long-term teaching sequence, our teaching practice, and the tasks we set for children to think hard and thrive.

Early Years Foundation Stage

In early years children will:

- Children will develop listening skills, problem-solving abilities and thoughtful questioning
- Children will improve subject skills and enter year 1 with a strong foundation knowledge
- Children will take photographs with a camera or tablet
- Children will use technologies such as tablets, iPads, computers or interactive whiteboards to watch video clips, listen to music or play games
- Children will explore keyboards and mice
- Children will use a Beebot

Intent

EYFS Vocabulary to Communicate in computing		
	Nursery	**Reception**
	Picture	Picture
	Computer	Computer
	iPad	iPad
	tablet	tablet
	photograph	photograph
		Keyboard
		Beebot
		Type
		Mouse
		Direction
		Route
		Group
		Category
		Sort

| Reception Early Learning Goals

Understanding the world

Links to Computing	The Natural World • Chooses to independently make observations of the natural world through taking photographs • Can demonstrate a developing knowledge of a diverse ecology from the wider community e.g. country parks and larger towns. • Knows that the environment and living things are influenced by human activity. Can describe some actions that people in their own community do that helps to maintain the area they live in. Finds out about and uses a range of technology to support their understanding.

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Curriculum coverage

The long-term plan demonstrates the break down of modules within each term in each year group. Modules are blocked per term.

Intent

Year 1	Online safety Computer systems and networks: improving mouse skills	Programming 1: algorithms unplugged Programming 2: Bee-Bot	Digital imagery Data handling: introduction to data Skills showcase: Rocket to the moon
Year 2	Online safety Computing systems and networks - What is a computer and word processing	Programming 1: algorithms and debugging Programming 2: scratch Jr	Creating media: stop motion Data handling: international space station
Year 3	Online safety Computing systems and networks 1: Networks and the internet	Computer systems and networks (2): emailing Creating media: video trailers	Programming: scratch (5 lessons to 3 plus quiz) Data handling: comparison cards databases Computer systems and networks (3): journey inside a computer
Year 4	Online safety Creating media: website design	Computing systems and networks: collaborative learning Data handling: investigating weather	Programming 1: Scratch Programming 2: computational thinking Skills showcase: HTML
Year 5	Online safety Computing systems and networks: search engines	Programming 1: music 1 week: Programming 2: Micro:Bit	Creating media: stop motion animation Data handling: Mars Rover Skills showcase: Mars rover 2
Year 6	Online safety Creating media: History of computers	Data handling: Big Data 1 Data handling: Big data 2	Computing systems and networks: Bletchley Park Programming: Intro to python (5 lessons to 3 plus quiz) Skills showcase: Inventing a product

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Key Stage 1

Intent

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Digital Literacy and Online Safety

Computational Thinking

Computers and Hardware

Year 1	Getting started (5 lessons)	Programming: Bee-Bots	Algorithms unplugged (5 lessons)	Digital imagery (5 lessons)	Introduction to data (5 lessons)	Rocket to the moon (5 lessons)
	Introducing children to logging in and using technology for a purpose, including creating art Go to topic	(5 lessons) Using Bee-Bots to navigate an area and constructing simple algorithms, through the story of The Three Little Pigs Go to topic	Learning how computers handle information by exploring 'unplugged' algorithms- completing tasks away from the computer Go to topic	Taking and manipulating digital photographs, including adding images found via a search engine Go to topic	Learning about what data is and how it can be represented and using these skills to show the findings of a mini beast hunt Go to topic	Appreciating the value of computers, understanding that they helped us get to the moon Go to topic
	DL Recognising common uses of information technology. Logging in and saving work on their own account. Knowing what to do if they have concerns about content or contact online. Understanding of how to create digital art using an online paint tool. **CH** Learning to locate where keys are on the keyboard. Developing basic mouse skills.	**CT** Learning how to explore and tinker with hardware to find out how it works. Constructing a series of instructions into a simple algorithm. Applying computing concepts to real world situation in an unplugged activity.	**CT** Understanding how to create algorithms. Learning that computers need information to be presented in a simple and clear way. Understanding how to break a computational thinking problem into smaller parts in order to solve it.	**DL** Using technology purposefully to create, organise, store, manipulate and retrieve digital content. Knowing what to do if they have concerns about content or contact online. **CT** Using logical reasoning to predict the behaviour of simple programs. **CH** Using cameras or tablets to take photos.	**DL** Using technology purposefully to create, organise, store, manipulate and retrieve digital content. Selecting software appropriately. **CH** Recognising uses of technology beyond school.	**DL** Using technology purposefully to create, organise, store, manipulate and retrieve digital content. Selecting software appropriately.
Cross curricular links	Art & Design Maths			English: Reading	Maths Science	Science D&T Maths History

Key Stage 1

Intent

Year 2	What is a computer? (5 lessons)	Word processing (5 lessons)	Programming: ScratchJr (5 lessons)	Algorithms and debugging (5 lessons)	International Space Station (5 lessons)	Stop motion (5 lessons)
	Children explore exactly what a computer is, identifying and learning how inputs and outputs work, how computers are used in the wider world and designing their own computerised invention **Go to topic**	Using their developing word processing skills, pupils write simple messages to friends and learn why we must be careful about who we talk to online **Go to topic**	Using the app 'ScratchJr', pupils programme a familiar story and an animation of an animal, make their own musical instruments and follow an algorithm to record a joke **Go to topic**	Identifying problems with code using both 'unplugged' and 'plugged' systems to diagnose and correct errors in an algorithm- a process known as 'debugging' **Go to topic**	Building on their understanding of how computers sense the world around us, pupils learn how data is collected, used and displayed to keep astronauts safe on-board the I.S.S **Go to topic**	Pupils create simple animations, storyboarding their ideas then decomposing it into small parts of action to be captured using Stop Motion Animation Software **Go to topic**
	CT Learning about inputs and outputs and how they are used in algorithms. **CH** Understanding what a computer is and the role of individual components.	**DL** Using word processing software to type and reformat text. Understanding the importance of staying safe online.	**CT** Creating and debugging simple programs. Using logical reasoning to predict the behaviour of simple programs. Understanding what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. **DL** Using technology purposefully to create, organise, store, manipulate and retrieve digital content.	**CT** Creating and debugging simple programs. Using logical reasoning to predict the behaviour of simple programs. Understanding what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.	**DL** Using technology to create and label images and to put data into a spreadsheet. **CT** Consider inputs and outputs to understand how sensors work.	**DL** Using technology purposefully to create, organise, store, manipulate and retrieve digital content. **CH** Understanding how to use tablets or computers to take photos.
Cross curricular links	D&T Science	PSHE			Science	English

Key Stage 2

Intent

Year 3	Emailing (5 lessons) Pupils learn how to send emails, including attachments and how to be responsible digital citizens Go to topic	Journey inside a computer (5 lessons) Children learn about the different parts of a computer through role-play and develop their understanding of how they follow instructions Go to topic	Top trumps databases (5 lessons) Developing their understanding of data and databases, children play with and create their own Top Trumps cards, learning how to interpret information by ordering and filtering Go to topic	Digital literacy (5 lessons) Developing their video skills, pupils create a book trailer, storyboarding their trailers before then filming and editing their videos, adding effects such as transitions, music, voice and text Go to topic	Programming: Scratch (5 lessons) Using Scratch, with its block-based approach to coding, pupils learn to tell stories and create simple games Go to topic	Networks and the internet (5 lessons) To understand how computers communicate, children learn about networks and the internet, and how they are used to share information. Go to topic
	DL Learn about cyberbullying and fake emails. Understanding the purpose of emails.	**CH** Understanding what different components of a computer do. **CT** Understanding that programs execute by following precise and unambiguous instructions.	**DL** Using technology purposefully to create, organise, store, manipulate and retrieve data.	**DL** Using technology purposefully to create, organise, store, manipulate and retrieve digital content, including searching for relevant information.	**CT** Using logical reasoning to explain how simple algorithms work. Designing, writing and debugging programs that accomplish specific goals, including controlling or simulating physical systems. Solving problems by decomposing them into smaller parts. Using sequence, selection, and repetition in programs. Working with variables and various forms of input and output.	**CH** Identifying network components and understand how they are used to connect to the internet and how data is transferred. **DL** Understanding computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration.
Cross curricular links	English		Maths	English		

ABBOTS GREEN ACADEMY

Intent

Year 4	Collaborative learning (5 lessons)	Further coding with Scratch (5 lessons)	Website design (5 lessons)	HTML (5 lessons)	Investigating weather (5 lessons)	Computational thinking (5 lessons)
	Learning to work collaboratively in a responsible way using tools including Google Docs and Sheets Go to topic	The coding program Scratch is explored further by revisiting key features and introducing the children to the crucial concept and execution of using 'variables' in code scripts. Go to topic	Pupils design and create their own websites, considering content and style, as well as understanding the importance of working collaboratively Go to topic	Pupils explore the language behind well-known websites, while developing their understanding of how to change the core characteristics of a website using HTML and CSS Go to topic	Children investigate the role of computers in forecasting and recording weather as well as how technology is used to present forecasts Go to topic	Through developing their understanding of the four pillars of computational thinking, children learn to identify them in different contexts Go to topic
	DL Selecting using and combining a variety of software to design and create a range of programs, systems and content that accomplish given goals. Understanding opportunities offered by the World Wide Web for communication and collaboration.	**CT** Using logical reasoning to explain how simple algorithms work. Designing, writing and debugging programs that accomplish specific goals, including controlling or simulating physical systems. Solving problems by decomposing them into smaller parts. Using sequence, selection and repetition in programs. Working with variables and various forms of input and output.	**DL** Selecting using and combining a variety of software to design and create a range of programs, systems and content that accomplish given goals. Understanding opportunities offered by the World Wide Web for communication and collaboration.	**DL** Recognising that information on the Internet might not be true or correct. Using technology safely, by recognising acceptable/ unacceptable behaviour. Knowing what to do when they have concerns about content or contact online. **CT** Understanding that websites can be altered by exploring the code beneath the site. Designing, writing and debugging programs that accomplish specific goals. Solving problems by decomposing them into smaller parts.	**DL** Understanding why some sources are more trustworthy than others. **CT** Understanding the role of inputs and outputs in computerised devices.	**CT** Understand what decomposition is and how it facilitates problem solving. Designing, writing and debugging programs that accomplish specific goals. Understand abstraction and patterns recognition.
Cross curricular links					Science Geography	

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Key Stage 2

Intent

Year 5	Online safety (5 lessons)	Micro:bit (5 lessons)	Search engines (5 lessons)	Sonic Pi (5 lessons)	Mars Rover 1 (5 lessons)	Mars Rover 2 (5 lessons)
	Pupils create an online safety resource for younger children using tools such as presentation software, video tools or a simple stop-motion animation Go to topic	Programming a small device called a micro:bit to display animations or messages on its simple LED display using block coding Go to topic	To enable children to quickly and accurately find information and become independent learners, they need to develop their searching skills and learn how to identify trustworthy sources Go to topic	Composing music using code through Sonic Pi, pupils can import samples, add drum beats and compose simple tunes culminating in a 'battle of the bands' using live loops of music Go to topic	Pupils explore inputs and outputs as well as Binary numbers to understand how the Mars Rover transmits and receives data and how scientists are able to control it to explore another planet! Go to topic	Children learn how the Mars Rover is able to send images all the way back to Earth and experiment with online CAD software to design new tyres for it Go to topic
	DL Recognising that information on the Internet might not be true or correct. Using technology safely, by recognising acceptable/ unacceptable behaviour and knowing what to do when they have concerns about content or contact online.	**CT** Using block coding to program a device. To explore variables and different forms of input. **CH** Understand how external devices can be programmed by a separate computer.	**DL** Recognising that information on the Internet might not be true or correct. Know how to use key words to quickly find accurate information.	**DL** Selecting using and combining a variety of software to design and create a range of programs, systems and content that accomplish given goals. **CT** Using programming language to create music, including use of loops.	**DL** Understanding computer networks including the internet; how they can provide multiple services, such as the world-wide web; and the opportunities they offer for communication and collaboration. **CH** Using search technologies effectively, appreciating how results are selected and ranked, and be discerning in evaluating digital content. Recognising that computers transfer data in binary and understand simple binary addition.	**DL** Developing their CAD skills. **CH** Understanding how image data is transferred.
Cross curricular links				English: Reading Music		

Intent

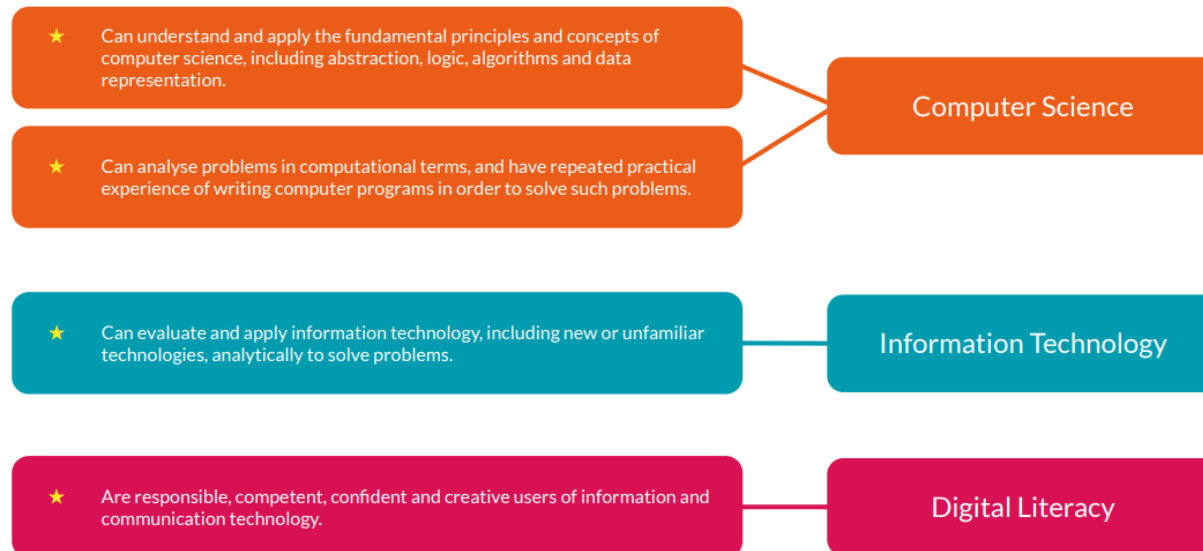| Year 6	Bletchley Park 1 & 2 (10 lessons)		Intro to Python (5 lessons)	Big Data 1 (5 lessons)	Big Data 2 (5 lessons)	Skills Showcase (5 lessons)
	Children learn about the history of Bletchley Park, including: key historical figures, how the first modern computers were created at as part of a WWII code breaking team and consider how computers have evolved over time. They then go on to investigate secret codes and how they are created, exploring 'brute force' hacking and learn how to make passwords more secure **Go to topic**		Building on their knowledge of coding from previous years, children are introduced to the text-based programming language Python, which is the language behind many apps and programs, such as Dropbox **Go to topic**	Children learn how data is collected and stored by exploring barcodes, QR codes and RFID chips, and investigate how collecting big data can be used to help people in a variety of different scenarios **Go to topic**	Children learn the difference between mobile data and WiFi and how data is transferred and use their understanding of big data to design their own smart school **Go to topic**	Reflecting on and showcasing their computing skills, pupils create an entire project around a specific theme **Go to topic**
	DL Understanding the importance of secure passwords and using searching and word processing skills to create a presentation. **CT** Using programming software to understand hacking, relating this to computer cracking codes in WWII.	**DL** Editing sound recordings for specific purpose. **CH** Learning about the history of computers and how they evolved over time.	**CT** Understanding that websites can be altered by exploring the code beneath the site. Designing, writing and debugging programs that accomplish specific goals Solving problems by decomposing them into smaller parts.	**DL** Understanding how learning can be applied to a real world context. Selecting, using and combining a variety of software to design and create a range of programs, systems and content to collect, analyse, evaluate and present data. **CH** Understanding that computer networks provide multiple services Understanding how barcodes and QR codes work.	**DL** Selecting, using and combining a variety of software to design and create a range of programs, systems and content to collect, analyse, evaluate and present data.	**DL** Showcasing their digital literacy skills. **CT** Demonstrating their computational thinking skills by designing and debugging programs, using different inputs and outputs. **CH** Understanding how search engines work and knowing how to use them safely and effectively.
Cross curricular	History Maths	English	Art & Design Maths	Science		

Computing at Abbots Green Academy
IMPLEMENTATION

At Abbots Green we use Kapow Primary's Computing scheme. This aims to instil a sense of enjoyment around using technology and to develop pupil's appreciation of its capabilities and the opportunities technology offers to, create, manage, organise, and collaborate. The use of different software and programs forms a part of the ethos of the scheme as we want to develop pupils' confidence when encountering new technology, which is a vital skill in the ever evolving and changing landscape of technology.

Through our curriculum, we intend for pupils not only to be digitally competent and have a range of transferable skills at a suitable level for the future workplace, but also to be responsible online citizens. The scheme of work enables pupils to meet the end of Key Stage Attainment targets outlined in the National curriculum and the aims align with those in the National curriculum.

★ Can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation.

★ Can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems.

Computer Science

★ Can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems.

Information Technology

★ Are responsible, competent, confident and creative users of information and communication technology.

Digital Literacy

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Kapow Primary™

Kapow's modular approach

The modules within Kapow Computing enable pupils to study in depth key computational understanding, digital skills and vocabulary. Each module aims to activate and build upon prior learning, including EYFS, to ensure better cognition and retention. Each module is carefully sequenced to enable pupils to purposefully layer learning from previous sessions to facilitate the acquisition and retention of key knowledge. Individual modules and lessons build on knowledge that has previously been taught. Outcomes are revisited either later in the year or in the following year as part of a spaced retrieval practice method to ensure pupils retain key knowledge and information.

Progression of skills for one strand (Computational Thinking) across EYFS to Year 6

Quizzing

Quizzing is used at the beginning of all computing lessons and at the end of each module. The purpose of the short quizzes is to establish the retention of knowledge and understanding of the module content. Throughout each module pupils continually revisit the quiz questions and previous content to reinforce key knowledge and vocabulary. As part of spaced retrieval practice, online safety quiz questions are revisited and referred to throughout the year.

Quiz question from last lesson:

What does going online mean?

a) turning your device on

b) connecting to the Internet

c) walking in a straight line

online

Today's quiz question:

What activities can be done online?

a) watching videos

b) playing at the park

c) reading a comic

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Planning

Planning All modules have sequenced planning from Kapow detailing five sessions, key concepts, knowledge and vocabulary to be taught. Kapow's lessons make use of freely available software and develop pupils' knowledge across five areas of learning: Computer systems and networks, programming, creating media, data handling and online safety. These feature guidance videos for teachers subject knowledge, teaching videos and teaching slides.

Teachers adapt these plans to differentiate or adhere to individual needs of their class. Noun project pictures are utilised to support SEND learners with new vocabulary.
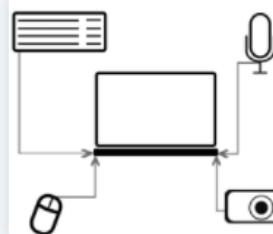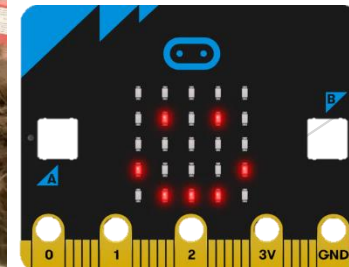
Digital literacy

A range of hardware and software are regularly planned into lessons in other areas of the curriculum. Laptops, interactive whiteboards and, in some year groups, iPads are integrated into learning. Frequently used software tools include Microsoft Excel, PowerPoint and Word as well as now familiar video conferencing software such as Teams and Zoom. Socrative quizzes can be used for recall and consolidation. Every child has access to Showbie, a classroom management platform that allows pupils to access and upload work in school and at home.

Kapow introduces a variety of software tools such as Scratch and Scratch Jr which are revisited throughout. At Abbots Green, we have an online reading library through Oxford Owl which pupils are expected to access to complete extra reading at home. Every child from Year 1 to Year 6 has a Times Tables Rockstars or NumBots account that they can access at home and school to practice their times tables on any device. There are termly battles among classes to encourage use. All of the above serve to create a cohort of digitally literate children growing up with technology.

CHROME MUSIC LAB

Count, Match and Order App

Number Patterns and Bonds App

Sorting Stones App

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Computing in the classroom

The development of digital literacy is apparent across the curriculum. iPads, Beebots and laptops are utilised in multiple subjects; not just computing. For example, BeeBots are used to support position and direction learning in maths (year 1 and 2) and laptops and iPads are used across all year groups to take part in times table competitions on TTRockstars.

All teachers have their own iPad that they utilise throughout the school day. In addition to this, all children in year 5 have their own iPad to complete their work where appropriate across the curriculum.

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Computing at Abbots Green Academy

IMPACT

Assessment

EYFS use the early excellence assessment tracker as an assessment tool is based around a Birth-5years child development framework. The assessment picture for each child is based on practitioner knowledge gained predominantly from observations and interactions with the child. Practitioners consider what a child can do consistently and independently in a range of everyday situations and take account of evidence from a range of perspectives. Effective assessment takes place within responsible pedagogy which enables each child to demonstrate learning in the fullest sense. It takes place when children have the opportunity to demonstrate their understanding, development and learning behaviours in a range of contexts. Through their access to a rich learning environment, children are provided with the opportunities and conditions in which to demonstrate all aspects of their computing development in both the indoor and outdoor learning environments.

EYFS Computing Progression of Knowledge and Skills Overview

Programming	• I can give and follow instructions • I can make a floor robot move. • I can use simple software to make something happen. • I can make choices about the buttons and icons I press, touch or click on
Data handling	• I can tell you about different kinds of information such as pictures, videos, text and sound • I can sort and categorise data
Multimedia	• I can move objects on a screen • I can create shapes and text on a screen • I can use technology to show my learning
Technology in our lives	• I understand the main parts of a computer and how to use them • I can take a picture • I can tell you about technology that is used at home and at school • I can operate simple equipment • I can use a safe part of the internet to play and learn
Online safety	• I can ask an adult when I want to use the internet • I can tell an adult if something worrying or unexpected happened while I am using the internet • I can be kind to my friends • I can talk about the amount of time I spend using a computer, tablet or game device • I am careful with technology devices.

Assessment

Using the quizzes made available on Kapow, teachers can assess pupil knowledge during and at the end of each module. Throughout each module pupils continually revisit previous content and quizzing to reinforce key knowledge and vocabulary. Teachers assess pupils throughout each session to monitor pupils and inform planning for subsequent sessions. Pupils who are identified as needing support will be supported either during post teaching interventions or in the following session as appropriate. Pupils working at above expected standard will also be identified and challenged appropriately to extend their learning. Most feedback is verbal and live during the session in accordance with our Feedback Policy.

Quiz question:

What does going online mean?

a) turning your device on

b) connecting to the Internet

c) walking in a straight line

Question 1: A B C
Question 2: A B C
Question 3: A B C
Question 4: A B C
Question 5: A B C
Question 6: A B C
Question 7: A B C
Question 8: A B C
Question 9: A B C

Question 10:

Score:

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Evidence of learning

Photo and video evidence is taken for each of the five modular areas of learning per year group. These are computer systems and networks, creating media, data handling, online safety and programming.

IMPACT

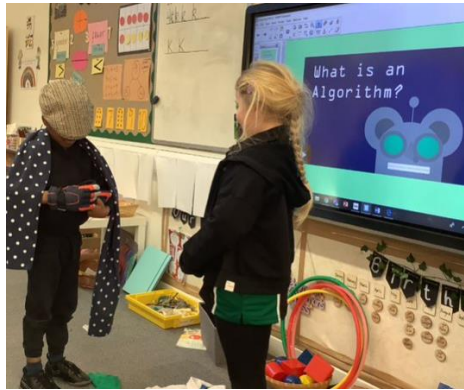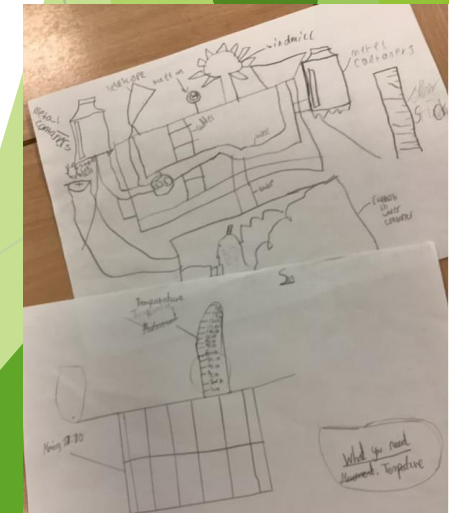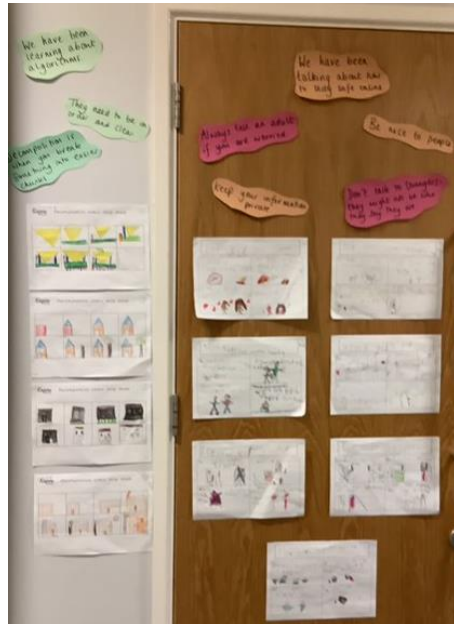| Computing systems and networks	Programming	Creating media	Data handling	Online safety
Identifying hardware and using software, while exploring how computers communicate and connect to one another.	Understanding that a computer operates on algorithms, and learning how to write, adapt and debug code to instruct a computer to perform set tasks.	Learning how to use various devices – record, capture and edit content such as videos, music, pictures and photographs.	Ensuring that information is collected, recorded, stored, presented and analysed in a manner that is useful and can help to solve problems.	Understanding the benefits and risks of being online – how to remain safe, keep personal information secure and recognising when to seek help in difficult situations.

Creating media- (iPad)

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Evidence of learning

IMPACT

Year 1

Year 2

Year 3

Year 4

Evidence of learning

Pupil voice	Evidence in knowledge
Through discussion and feedback, children talk enthusiastically about their computing lessons and speak about how they love learning on iPads and laptops. Children across the school articulate well about the potential risks of being safe online and can identify how to stay safe.	Pupils know how and why technology is used in the outside world, and in the workplace. They know about different wats that computers can be used.

IMPACT

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Beyond Abbots Green Academy

After the implementation of computing at Abbots Green Academy, pupils should leave school equipped with a range of skills to enable them to succeed in their secondary education and be active participants in the ever-increasing digital world.