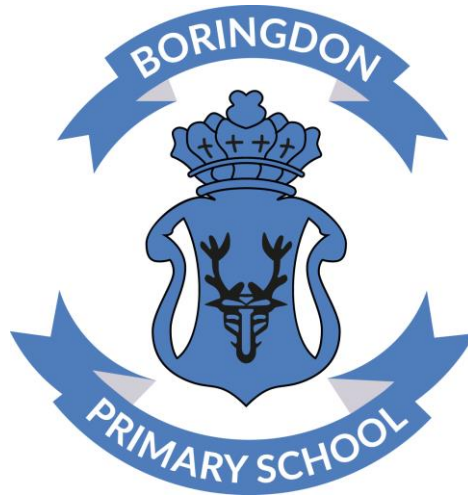


Boringdon Primary School



Computing Overview

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Boringdon Primary School Computing Vision

All pupils at Boringdon Primary School have the right to have rich, deep learning experiences that balance all aspects of computing. With technology playing such a significant role in society today, we believe that ‘computational thinking’ is a skill that children must be taught if they are to be able to participate effectively and safely in this digital world. A high-quality computing education equips pupils to use creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. At Boringdon Primary School, pupils are introduced to a wide range of technology, including desktops, iPads and interactive whiteboards, allowing them to continually practice and improve the skills they learn. This ensures they become digitally literate so that they are able to express themselves and develop their ideas through information and computer technology– at a level suitable for the future workplace and as active participants in a digital world.

Pupils are taught how to “be kind, be respectful and be your best” on and offline, which installs a sense of enjoyed around using technology as pupils know that they are safe and open to learn. We hope that this will then allow all pupils appreciation for technology to grow, along with their ever growing knowledge.

How do we teach computing?

We teaching computing weekly ensuring that lessons incorporate a range of teaching strategies from independent tasks, paired and group work while as well as unplugged and digital activities. This variety means that all lessons are engaging and appeal to those with a variety of learning styles. Pupils are exposed to multiple technologies throughout their school day including PC’s, laptops and iPads to embed their learning and where possible, use technology throughout the day (e.g. Accelerated Reader, group research projects etc). We revisit each topic every year, as the Kapow scheme focuses on five key areas:

- Computer systems and networks
- Programming
- Creating media
- Data handling
- Online safety

The expected impact of following the Kapow Primary Computing scheme of work is that children will:

- Be critical thinkers and able to understand how to make informed and appropriate digital choices in the future.
- Understand the importance that computing will have going forward in both their educational and working life and in their social and personal futures.
- Understand how to balance time spent on technology and time spent away from it in a healthy and appropriate manner, understand that technology helps to showcase their ideas and creativity, they will know that different types of software and hardware can help them achieve a broad variety of artistic and practical aims.
- Show a clear progression of technical skills across all areas of the National curriculum - computer science, information technology and digital literacy.
- Be able to use technology both individually and as part of a collaborative team.
- Be aware of online safety issues and protocols and be able to deal with any problems in a responsible and appropriate manner.
- Have an awareness of developments in technology and have an idea of how current technologies work and relate to one another.
- Meet the end of key stage expectations outlined in the National curriculum for computing

computing overview

	<u>R</u>	<u>Y1</u>	<u>Y2</u>	<u>Y3</u>	<u>Y4</u>	<u>Y5</u>	<u>Y6</u>
Term 1	Computing systems and networks 1: Using a computer	Computing systems and networks: Improving mouse skills	Networks 1: What is a Computer?	Computing systems and networks 1: Networks and the internet	Computing systems and networks: Collaborative learning	Computing Systems: Search engines	Computing systems and networks: Bletchley Park
Term 2	Mouse Skills Using media to draw a Christmas tree (paintnet)	Programming 1: Algorithms unplugged	Computing systems and networks 2: Word Processing	Computing System and networks 2: Emailing	Data Handling: Investigating Weather Patterns	Programming 1: Sonic Pi	Data handling 1: Big Data 1
Term 3	Programming 1: All about instructions	Programming 2: Bee-Bot	Programming 1: Algorithms and Debugging	Programming: Scratch	Creating Media: Website Design	Creating media: Stop motion animation	Creating Media: History of computers

Term 4	Computing systems 2: Exploring hardware	Data Handling	Data Handling (International Space Station)	Top Trumps Databases	Programming 1: Further coding with Scratch	Programming 2: Micro:bit	Programming: Intro to Python
Term 5	Programming 2: Programming Bee- Bots	Creating Media: Digital Imagery	Programming 2: ScratchJr Unit 2a Different sorts of inputs Unit 2b Buttons and instructions	Creating media: Video trailers	Programming 2: Computational thinking (Scratch)	Data handling: Mars Rover 1	Data handling 2: Big Data 2
Term 6	Data Handling: Introduction to data	Skills showcase: Rocket to the moon	Kapow Stop Motion	Computing systems and networks 3: Journey inside a Computer	Showcase: HTML	Skills showcase: Mars Rover 2	Skills Showcase: Inventing a product
Termly Assembly	Online Safety	Online Safety	Online Safety	Online Safety	Online Safety	Online Safety	Online Safety

National curriculum – Key Stage 1

Pupils should be taught to:	Y1 T1	Y1 T2	Y1 T3	Y1 T4	Y1 T5	Y1 T6	Y1 OS	Y2 T1	Y2 T2	Y2 T3	Y2 T4	Y2 T5	Y2 T6	Y2 OS
understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions		?			?	?					?	?		
create and debug simple programs		?				?					?	?		
use logical reasoning to predict the behaviour of simple programs		?	?			?		?			?	?		
use technology purposefully to create, organise, store, manipulate and retrieve digital content	?	?	?	?	?				?				?	
recognise common uses of information technology beyond school	?			?			?	?	?				?	
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.	?		?				?	?	?	?	?		?	?

National Curriculum – KS2

Pupils should be taught to:	Y3 T1	Y3 T2	Y3 T3	Y3 T4	Y3 T5	Y3 T6	Y3 OS	Y4 T1	Y4 T2	Y4 T3	Y4 T4	Y4 T5	Y4 T6	Y4 OS	Y5 T1	Y5 T2	Y5 T3	Y5 T4	Y5 T5	Y5 T6	Y5 OS	Y5 OS	Y6 T1	Y6 T2	Y6 T3	Y6 T4	Y6 T5	Y6 T6	Y6 OS
design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts		?		?		?		?			?	?	?		?		?		?						?			?	
use sequence, selection, and repetition in programs; work with variables and various forms of input and output		?		?				?			?				?		?		?						?			?	
use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs		?		?							?	?						?	?						?			?	
understand 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	?		?		?				?	?								?		?			?	?		?		?	

use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content		2			2	2	2	2	2	2						2	2	2		2	2				2	2		2	
select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	2	2	2		2	2	2	2	2							2	2			2	2					2	2	2	2

use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.			?		?	?	?		?					?					?	?					?			?	?
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Early Years computing

Reception follow the Kapow scheme which is supported by the use of “My World”. Kapow prepares the pupils for Year 1 and supports them with every day problem solving activities to embed their learning. Reception use “MyWorld” to support ‘unplugged’ lessons to ensure that pupils are provided with the opportunity to consolidate their learning ‘unplugged’ knowledge and recall prior ‘plugged’ knowledge.

While Computing isn’t on the EYFS framework, we still believe that there is a firm technological importance to computing in our pupils lives, whether that being in school or at home. Boringdon primary School recognises that we live in a technological world and technology is integrated into the lives of young children. Our curriculum will ensure that pupils are prepared for Year 1 with a strong foundation of knowledge, but the lessons additionally ensure that pupils develop their listening skills, problem-solving abilities and thoughtful questioning.

By the end of the year, Reception pupils will be able to:

- take a photograph with a camera or tablet
- search for information on the internet
- play games on the interactive whiteboard
- explore an old typewriter or other mechanical toys
- use a Beebot
- watch a video clip
- listen to music

Reception Curriculum overview

R	Unit Overview	Substantive knowledge	EYFS Framework
Kapow Computing systems and networks 1: using a computer Kapow and MyWorld	Learning about the main parts of a computer and how to use the keyboard and mouse. Logging in and out	How can you predict the outcome from a set of instructions? (what will happen when...) What is digital art? How do you log in/out of a computer?	• Communication and language • Understanding the world • Expressive art and design
Computing systems and networks 2: Exploring hardware	Tinkering and exploring with different computer hardware and learning to operate a camera	How can you predict the outcome from a set of instructions? (what will happen when...) How do you log in/out of a computer?	• Communication and language • Understanding the world • mathematics
Programming 1: all about instructions	The children learn to receive and give instructions and understand the importance of precise instructions	How do you operate a camera? Where do we use technology? Can you identify electric/computerised items? What is a keyboard? What is a mouse? How can you move and click a mouse? How do you log in/out of a computer?	• Communication and language • Understanding the world • Personal, social and emotional development • Mathematics • Understanding the world
Programming 2: Programming Bee-Bots	Children learn about directions, experiment with programming a Bee-bot/Blue-bot and tinker with hardware	How can you predict the outcome from a set of instructions? (what will happen when...) How do you log in/out of a computer?	• Communication and language • Understanding the world • Personal, social and emotional development

			• Mathematics • Understanding the world • Expressive art and design
Data Handling Introduction to data Kapow and MyWorld	Children sort and categorise data and are introduced to branching databases and pictograms	How can we sort _____? What is data? How do you log in/out of a computer?	• Communication and language • Understanding the world • Personal, social and emotional development • Mathematics • Physical development • Understanding the world
On-line safety Draw a self-portrait using Paint.net	Learn how to stay safe on the internet and that we should always ask for permission.	Where will you find technology? Can you identify technology? How do you log in/out of a computer?	• Communication and language • Physical development • Personal, social and emotional development

Year 1 - overview

Unit Overview	Substantive knowledge	National Curriculum link
<u>Developing mouse skills</u> Using computers more purposefully is introduced; learning how to login and navigate around a computer; developing mouse skills; learning how to drag, drop, click and control a cursor to create works	Where can you find computers? What do computers look like? How do you log into a computer? What tools should you use to change the colour and size of your shape? How do you use a mouse? /How do you drag and click?	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content • Recognise common uses of information technology beyond school

of art inspired by Kandinsky and self-portraits	What items should be password protected? Why do we need passwords? Can you identify a piece of hardware? (what is the name of this...) What is an input/output?	• Use technology safely and respectfully, keeping personal information private
<u>Bee Bots (algorithms)</u> Programming is introduced through the use of a Bee-Bot; exploring its functions, creating a video to explain its capabilities, undertaking an unplugged activity, creating a world for a Bee-Bot to explore and programming Bee-Bots to tell a story.	How can you predict where the Bee Bot may go? How do you programme a Bee Bot? Can you show me how the Bee Bot moves when you press different buttons? Can you explain what a Bee Bot does? What is an algorithm? How to you programme a Bee Bot to follow a planned route? How do you debug/reset your instructions if the Bee Bot/instructions goes wrong? What does decomposition mean?	• Use logical reasoning to predict the behaviour of simple programs • Create and debug simple programs • Use technology purposefully to create, organise, store, manipulate and retrieve digital content • Understand what algorithms are, how they are implemented as programs on digital devices and that programs execute by following precise and unambiguous instructions
<u>Digital imagery</u> Using creativity and imagination to plan a miniature adventure story and capture it using developing photography skills. Learn to enhance photos using a range of editing tools as well as searching for and adding other images to a project, resulting in a high-quality photo collage showcase.	What is the importance of sequencing? Which devices can you use to take a photo? How can photos be changed once they have been taken? How do you crop, resize and add a colour filter to a photo? How do you search online? What should you do if you see something that makes you uncomfortable? What does download mean? How do you use a camera? Can you follow (instructions)?	• Use logical reasoning to predict the behaviour of simple programs • Use technology purposefully to create, organise, store, manipulate ad retrieve digital content. • Identify where to go for help and support when they have concerns about the content or contact on the internet or other technologies.

<u>Introducing data</u> Learn what data is and the different ways that it can be represented, both with and without a computer before developing an understanding of why data is useful, how it can be used and the ways in which it can be gathered and recorded both by humans and computers	How can data be represented? How can you type using a keyboard? Can you identify a keyboard? What is data? How can you record data? How can you sort data? What is an input? Can you identify an input? Can you identify a chart/table?	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content • Recognise common uses of information technology beyond school
<u>Rocket to the moon</u> Development of keyboard and mouse skills through designing, building and testing individual rockets by creating a digital list of materials, using drawing software and recording data, as well as developing computational skills through sequencing and debugging a set of instructions.	What is a spreadsheet? How do you open a spreadsheet? How do you input data into cells on a spreadsheet? How do you order instructions? Why is it important for instructions to be in the right order? What is a digital image? How do you make a digital image? What are the different types of digital content? (words and pictures) How can you make a list on a computer?	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content • Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
<u>Algorithms unplugged</u> This unplugged unit requires no computers so that algorithms, decomposition and debugging are made relatable to familiar contexts, such as dressing up, following directions or making a sandwich, while learning why	What is an algorithm? Why do instructions need to be carried out in a specific order? Why do computers use algorithms? Why must an algorithm be clear and precise? Can you identify an input/output device? What is a bug in an algorithm?	• Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions • Create and debug simple programs

instructions need to be specific and unambiguous	How can you fix a bug?	• Use logical reasoning to predict the behaviour of simple programs
<u>Online safety</u> Learning about online safety, including using useful tips to stay safe when online; how to manage feelings and emotions when someone or something has upset us online; learning about the responsibility we have as online users; exploring the idea of a 'digital footprint'	What is the internet? What should we do if we are or someone else is treated unkindly online? Who should you seek help from? How can you stay happy and safe online? What does it mean to 'share' and 'post' online? What is a digital footprint?	• recognise common uses of information technology beyond school • 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

Year 2 - overview

Unit overview	Substantive knowledge	National Curriculum link
<u>What is a computer?</u> When picturing a computer, thoughts are often of a screen, mouse and keyboard. This unit explores exactly what a computer is by identifying and learning how inputs and outputs work, how computers are used in the wider world and designing their own computerised invention	Can you name the key parts of a computer? What is the purpose of a screen, a monitor, a mouse and a keyboard? Can you predict what each button on a computer will do? What is an input/output? What does technology mean/do? Can you identify this piece of hardware?	• Recognise common uses of information technology beyond school • Use technology purposefully to create, organise, store, manipulate and retrieve digital content • Use logical reasoning to predict the behaviour of simple programs
<u>Algorithms and Debugging</u> This combination of unplugged and plugged-in activities develop an understanding of; what algorithms are, how to program them and how they can be developed to be more efficient, introduction of loops	What is an algorithm? What does decomposition mean? How do computers use algorithms to make predictions? What is a loop? What does 'debugging' mean? What is abstraction? How can you predict what may happen? What can you predict will happen when_____?	• Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions • Create and debug simple programs • Use logical reasoning to predict the behaviour of simple programs • Solve problems by decomposing them into smaller parts • Use sequence and repetition in programs • Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

<u>Word Processing</u> Learn about word processing and how to stay safe online as well developing touch-typing skills. Introduce important keyboard shortcuts, as well as simple editing tools within a word processor including bold, italics, underline and font colour as well as how to import images	What are the home keys on a computer? How can you type a capital letter using the shift key? How can you select text and make it bold or italic? How can you search for an image? How can you import and alter an image in a document? How can you copy and paste? What is/is not safe to share online? Who should you talk to if something that is shared online makes you feel sad or worried?	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content • Use technology safely and respectfully, keeping personal information private • Recognise common uses of information technology beyond school • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact
<u>Programming (Scratch Junior)</u> Explore what 'blocks' do, using the app 'ScratchJr,' by carrying out an informative cycle of predict > test > review, programme a familiar story and an animation of an animal, make their own musical instrument by creating buttons and recording sounds and follow an algorithm to record a joke	What does coding mean? How can you predict what something will do? What is a programming block? What is a loop? How can you design a program code to run 'on tap'? Why do you need to sequence your blocks in a set order?	• Use logical reasoning to predict the behaviour of simple programs • Create and debug simple programs • Use technology purposefully to create, organise, store, manipulate and retrieve digital content • Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
<u>Data handling: International Space Station</u> The International Space Station (ISS) is a fascinating real-world setting for	How is a computer used to monitor data? How can you draw and add text to a project using your mouse and keyboard? How can you represent data?	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content

teaching how data is collected, used and displayed as well as the scientific learning of the conditions needed for plants and animals, including humans, to survive	How can you create an algorithm?	
<u>Stop Motion</u> Storyboarding and simple animation creation using either tablet devices or devices with cameras	What is an animation? What does 'stop motion' mean? How can you create a short animation? What is 'onion skinning'? What does decompose mean? What is a frame? How can you take a photo on a camera/tablet?	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content • Recognise common uses of information technology beyond school • Use technology safely and respectfully, keeping personal information private
<u>Online safety</u> Learning about online safety, including: what happens to information posted online; how to keep things private online; who we should ask before sharing online; describing different ways to ask for, give, or deny permission online	What is online information? What is/is not safe to share online? Who can you talk to if something makes you worried or sad? What is a password? Why do we need passwords? How can you keep your information private? Why is it important to ask for permission? What should we do if something makes us upset or scared online?	• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

Year 3 - overview

Unit Overview	Substantive knowledge	National Curriculum link
<u>Networks</u> Introduction to the concept of networks, learning how devices communicate. Identifying components, learning how information is shared and exploring examples of real-world networks. Options for both Google and Microsoft schools	What is a network? What devices are in a network? What is the internet? What is wireless connection and why is it helpful? What is a device? (name multiple e.g. printer, desktop, laptop, iPad etc) How does information move around a network? What is a submarine cable? What is a packet and why is it useful that they are numbered?	• Understand 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 • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
<u>Journey inside of a computer</u> Assuming the role of computer parts and creating paper versions of computers helps to consolidate an understanding of how a computer works, as well as identifying similarities and differences between various models	What is an input and an output? What are some examples of some inputs and outputs? What happens inside the computer when you move the mouse? What happens inside the computer when you click on something? What are the similarities and differences of a laptop and a tablet? What are the parts inside of a laptop/tablet? What is a CPU/GPU? Why do computers need memory?	• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals,

		including collecting, analysing, evaluating and presenting data and information • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
<u>Comparison cards databases</u> Learning about records, fields and data, the children further explore the concepts of sorting and filtering.	What is a database? How do we compare two different values? Why is it useful to sort data? How do you filter results? When might we need to use a database? Which method of representing data would be more beneficial (chart or graph)? What are databases used for? How do you insert a chart/table? Why are digital databases easier than paper databases? Why might we need a password to protect data?	• Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information • Understand 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 • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

<u>Programming Scratch</u> Building on the use of the 'ScratchJr' application in Year 2, progress to using the more advanced computer-based application called 'Scratch', learning to use repetition or 'loops' and building upon skills to program; an animation, a story and a game	What is coding? What is an algorithm? What is coding used for? What will this code do? What is a loop? Why are loops useful in music? Why would we want to use a loop? What is an animation? What is a sprite? What is a block? How can you change the size of the sprite? Can you predict what will happen when...?	• Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs • Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output
<u>Emailing</u> Learning how to send emails with attachments and how to be a responsible digital citizen by thinking about the contents of what is sent.	What is an email? How and why do we use emails? What does being a responsible citizen mean? What is good about an email as a form of communication? How and why do you add attachments? What should you do if someone is unkind to you online or if you receive a 'spam' email? How can you tell if someone is being real or fake?	• Understand 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 • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create [...] content that accomplish given goals • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour;

		identify a range of ways to report concerns about content and contact
<u>Video trailers (digital literacy)</u> Developing filming and editing video skills through the storyboarding and creation of book trailers	<u>Term 6 – Video trailers (digital literacy)</u> What is media? What is a trailer? Can you name different types of media? How do sound effects and music change the effect of a video? How do we add effects and sound to a video trailer? What is a device? How do you use WeVideo? What is a sequence?	• Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. • Solve problems by decomposing them into smaller parts
<u>Online Safety</u> Learning about online safety: ‘fake news’, privacy settings, ways to deal with upsetting online content, protecting our personal information on social media	What is a ‘hoax’? What is fake news? What is news? Why shouldn’t we believe everything we see on the internet? What is a fact? What is a search engine?	• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and

	What should we do if we are a victim of or witness cyber bullying? if we are unsure about whether to put something online who should we ask for help and advice? What are privacy settings and how/why should we set them? Who can you share personal information with? What could happen to your personal information if the privacy settings are no correct? What are social media platforms?	content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information. • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.
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Year 4 - overview

Unit Overview	Substantive knowledge	National Curriculum link
<u>Investigating weather patterns</u> Researching and storing data using spreadsheets; designing a weather station that gathers and records data; learning how weather forecasts are made and using green screen technology to present a weather forecast.	What is data? What is a spreadsheet? How can you read data? How can you present data? How can you search on the internet? What is a search engine? What is an algorithm? How do you write an algorithm?	• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information • Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output
<u>Computer systems and networks: collaborative learning</u> Working collaboratively in a responsible and considerate way as well as looking at a range of collaborative tools.	How can you communicate/work with someone without being in the same room? What types of behaviour is not acceptable online? How can you share a document via email? How do you reply to an email? What is a presentation software?	• Understand 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 • Use technology safely, respectfully and responsibly; recognise

	How do you add text and pictures to a presentation? How do you add transmissions and animations to your slides? Why might a survey be useful? How can you export data to a spreadsheet? What can spreadsheets be used for?	acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information • Use technology safely, respectfully and responsibly
<u>Creating media: Website Design</u> Children develop their research, word processing, and collaborative working skills whilst learning how web pages and web sites are created, exploring how to change layouts, embed images and videos and link between pages.	What is a web page? What are the features of a webpage? How do you add videos and links to websites? How can we make our website informative or interactive? How should/could you present information? How do you create a webpage?	• Understand 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 • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact
<u>Programming 1: Further coding with Scratch</u> Using variables in coding.	What are the main parts of Scratch? How can you adjust a sprite? What is a Sprite? What is an algorithm? What is a code block? What is a script?	• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

	What does decomposition mean? What is a variable?	• Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output
<u>Programming 2: Computational thinking (Scratch)</u> Plugged and unplugged activities to develop the four areas of computational thinking	What is computational thinking? What is decomposition? What is pattern recognition? How can you recognise a pattern? What is an algorithm? What is a block on Scratch? What is a variable? What is a script?	• Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs • Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
<u>Skill Showcase: HTML</u> Editing the HTML and CSS of a web page to change the layout of a website and the text and images	What is a HTML tag? What is a line of code? How can you make some changes to a HTML code? How can you change the text size and content on a website? How can you change the HTML and CSS to alter the appearance of an object on the web? What are the components of a webpage? What is fake news and how can you identify it? How can you alter text and pictures on a webpage?	• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems • Solve problems by decomposing them into smaller parts

<u>Online safety</u> Learning how to navigate the internet in an informed, safe and respectful way	How can we safely search for information on search engines social media and image and video sites? What is fake news? How and why do companies use 'in app purchases' and 'pop ups'? What is a fact, opinion and belief? What is a 'bot'? Why should we limit the amount of time we spend on technology? How can you be respectful online? How can you keep yourself and others safe online?	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and

Year 5 – Overview

Unit Overview	Substantive knowledge	National Curriculum link
<u>Stop motion</u> Storyboarding ideas, taking photographs and editing to create a video animation	What does animation mean? What is a frame? What does stop motion mean? What is onion skinning? What does decompose mean? What devices can you successfully use to make a stop motion animation?	• use sequence, selection, and repetition in programs; work with variables and various forms of input and output • design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller part
<u>Search Engines</u> Using keywords and phrases, identifying inaccurate information, learning page rank works as well.	What is a search engine? How can you use search engines to navigate the web? How can you create a website? How can you check the validity of a website? What is fake news? What is a key word and why are they important? What is a web index and what is its role? What is a web crawler? What is an algorithm?	• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • Select, use and combine a variety of software (including internet services) to create content that accomplishes given goals, including collecting data and information • Use search technologies effectively and be discerning in evaluating digital content • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact •

<u>Programming: Music</u> Applying programming skills to create sounds and melodies leading to a battle of the bands performance	How can you predict what something will do? What is a loop? How can you put a loop in your program? What does 'spacing' mean? What is coding? What is an example of a command? What does debugging mean and how do you debug a code? What different variables can you add to your loop and what is their role?	• Design, write and debug programs that accomplish specific goals • Use sequence, selection, and repetition in programs • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs
<u>Data handling: Mars Rover 1</u> Data transfer and binary code	How and why is data collected from space? What does 'data' and 'transmit' mean? What are the challenges of transmitting data over large distances? What is a computer network? How can networks and the internet provide multiple services? What is a 'bit'? What is binary coding? What is an input and an output? How does the size of random-access memory (RAM) affect the processing of data (CPU)?	• Understand 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 • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
<u>Programming 2: Micro:Bit</u> The meaning and purpose of programming	What is a micro:bit? What device can connect to a computers network? What is an animation? What is a sequence/algorithm? What does decompose mean?	• Design, write and debug programs that accomplish specific goals • Use sequence, selection, and repetition in programs; work with various forms of input and output

	What is the difference between 'on start' and 'forever'? What is a code block? How can you decompose a program? What is copyright? What is the role of the web index? What are web crawlers?	• Solve problems by decomposing them into smaller parts • Use logical reasoning to explain how some simple algorithms work • Work with variables and various forms of input
<u>Skills showcase: Mars Rover 2</u> 3D design skills	What is binary? How can computers transfer data in binary? What is a pixel? What are pixels used for? What is JPEG? How can you reduce a file size? What is the difference between ROM and RAM? What is the fetch, decode, execute cycle? What is an algorithm? How can we keep our personal information safe? What is an online community?	• Understand 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 • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
<u>Online Safety</u> Potential online dangers and safety	What is the importance of keeping our passwords safe? Why do we need passwords to access apps? How to apps require permission for personal data?	• Understand 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

	What are the different types of online communication? What are the positives and negatives of online communication? How can you search for people's personal information online? Why might you do this? How can you tell if someone's personal information is accurate? What are the differences between online and offline bullying? How can you help those who are being bullied?	• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
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<u>Year 6 - Overview</u>		
Unit Overview	Substantive knowledge	National Curriculum link
<u>Big Data 1</u> Barcodes, QR codes and RFID	What is a QR code? What are the limitations of a barcode and QR code? How is data contained in a bar code? How can infrared light be used to transmit data? What is infrared? What is binary? How can RFID can be used to transmit data? What is the importance of encoding? How can you sort data on an Excel sheet?	• Understand 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 • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

<u>Big Data 2</u> Data usage and smart schools	How can data become corrupted within a network? What is a 'packet'? Why is data sent in a 'packet'? What are methods of wireless data transfer? What is the difference between WiFi and mobile data? How can data analysis improve city life? How do devices be connected to the internet? What is GPS mostly used for?	• Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information • Understand 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
<u>Computing systems and networks:</u> <u>Bletchley Park 1</u> Code breaking and password hacking	Why might codes be valuable? What is a secret code and why are they used? What is meant by 'Brute Force Hacking?' Why is it important to have a secure password? What was the first computer built for? How can you make a website? How can you search the internet safely? How can you use 'key words' to have more accurate results when searching the internet?	• Solve problems by decomposing them into smaller parts • Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs • Select, use and combine a variety of software [...] to design and create a range of programs, systems and content that

		accomplish given goals, including collecting, analysing, evaluating and presenting data and information • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact
<u>Creating media: History of computers</u> Children write, record and edit radio plays set during WWII, look back in time at how computers have evolved and design a computer of the future.	What are the key features of radio play? How can you record sounds using a sound recording software? How can you add sound effects into your recording?	• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • Understand 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 • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
<u>Intro to Python</u> Using the programming language of Python	How can you predict what something may do? What is a loop? Why do we use loops? How do nested loops work?	• Design, write and debug programs that accomplish specific goals including controlling or simulating physical systems;

	What is a command? What is a code? How can you decompose a picture? What are the use of each command on Python? How can you write an algorithm? What is white noise? How many bits are in a byte? (8)	solve problems by decomposing them into smaller parts • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output • Solve problems by decomposing them into smaller parts • Solve problems by decomposing them into smaller parts
<u>Skills Showcase: Inventing a product</u> Designing a product, pupils: evaluate, adapt and debug code to make it suitable and efficient for their needs; use a software program to design their products; create their own websites and video adverts to promote their inventions.	What is the role of a code? How can you debug a program? How can you use sequence, selection, repetition, variables or inputs and outputs within a program? What is an input and an output? How can you create an appealing website? What are the features of a website? What does CAD stand for? What are 'image rights'?	• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information • Use technology safely, respectfully and responsibly; recognise

		acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. • Understand 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 • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
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<u>Online Safety</u> Learning how to navigate the internet in an informed, safe and respectful way	Can you name some scenarios where someone may feel sad, worried or uncomfortable on the internet? How can you get help on and offline? What is/is not appropriate to share online? How can you show respect to others online? What is the risk of sharing things online, even if it is sent privately? What is a positive online reputation? What strategies can you use to create an online reputation? How can you collect evidence of cyber bullying?	• use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact
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	Who should we share evidence with? Why do we need passwords? How can we create a strong password? What should you do if your password is shared, lost or stolen? How can you increase your privacy settings? Why should you keep your software updated? How can you identify scams?	
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Progression of skills

Computer systems and networks

Reception	How can you predict the outcome from a set of instructions? (what will happen when...) What is digital art? How do you log in/out of a computer? How can you predict the outcome from a set of instructions? (what will happen when...) How do you log in/out of a computer?
Year 1	Where can you find computers? What do computers look like? How do you log into a computer? What tools should you use to change the colour and size of your shape? How do you use a mouse? /How do you drag and click? What items should be password protected? Why do we need passwords? Can you identify a piece of hardware? (what is the name of this....?) What is an input/output?
Year 2	Can you name the key parts of a computer? What is the purpose of a screen, a monitor, a mouse and a keyboard? Can you predict what each button on a computer will do? What is an input/output? What does technology mean/do? Can you identify this piece of hardware?
Year 3	What is a network? What devices are in a network? What is the internet? What is wireless connection and why is it helpful? What is a device? (name multiple e.g. printer, desktop, laptop, IPad etc) How does information move around a network?

	What is a submarine cable? What is a packet and why is it useful that they are numbered? What is an input and an output? What are some examples of some inputs and outputs? What happens inside the computer when you move the mouse? What happens inside the computer when you click on something? What are the similarities and differences of a laptop and a tablet? What are the parts inside of a laptop/tablet? What is a CPU/GPU? Why do computers need memory?
Year 4	How can you communicate/work with someone without being in the same room? What types of behaviour is not acceptable online? How can you share a document via email? How do you reply to an email? What is a presentation software? How do you add text and pictures to a presentation? How do you add transmissions and animations to your slides? Why might a survey be useful? How can you export data to a spreadsheet? What can spreadsheets be used for?
Year 5	What is a search engine? How can you use search engines to navigate the web? How can you create a website? How can you check the validity of a website? What is fake news? What is a key word and why are they important? What is a web index and what is its role? What is a web crawler? What is an algorithm?

	What is a network?
Year 6	Why might codes be valuable? What is a secret code and why are they used? What is meant by 'Brute Force Hacking?' Why is it important to have a secure password? What was the first computer built for? How can you make a website? How can you search the internet safely? How can you use 'key words' to have more accurate results when searching the internet? What is hardware/software?

Programming

Reception	How do you operate a camera? Where do we use technology? Can you identify electric/computerised items? What is a keyboard? What is a mouse? How can you move and click a mouse? How do you log in/out of a computer? How can you predict the outcome from a set of instructions? (what will happen when...) How do you log in/out of a computer?
Year 1	How can you predict where the Bee Bot may go? How do you programme a Bee Bot? Can you show me how the Bee Bot moves when you press different buttons? Can you explain what a Bee Bot does? What is an algorithm? How do you programme a Bee Bot to follow a planned route? How do you debug/reset your instructions if the Bee Bot/instructions goes wrong? What does decomposition mean?
Year 2	What are the home keys on a computer?

	How can you type a capital letter using the shift key? How can you select text and make it bold or italic? How can you search for an image? How can you import and alter an image in a document? How can you copy and paste? What is/is not safe to share online? Who should you talk to if something that is shared online makes you feel sad or worried?
Year 3	What is coding? What is an algorithm? What is coding used for? What will this code do? What is a loop? Why are loops useful in music? Why would we want to use a loop? What is an animation? What is a sprite? What is a block? How can you change the size of the sprite? Can you predict what will happen when...?
Year 4	What are the main parts of Scratch? How can you adjust a sprite? What is a Sprite? What is an algorithm? What is a code block? What is a script? What does decomposition mean? What is a variable? What is computational thinking? What is decomposition? What is pattern recognition?

	How can you recognise a pattern? What is an algorithm? What is a block on Scratch? What is a variable? What is a script?
Year 5	How can you predict what something will do? What is a loop? How can you put a loop in your program? What does 'spacing' mean? What is coding? What is an example of a command? What does debugging mean and how do you debug a code? What different variables can you add to your loop and what is their role? What is a micro:bit? What device can connect to a computers network? What is an animation? What is a sequence/algorithm? What does decompose mean? What is the difference between 'on start' and 'forever'? What is a code block? How can you decompose a program? What is copyright? What is the role of the web index? What are web crawlers?
Year 6	How can you predict what something may do? What is a loop? Why do we use loops? How do nested loops work? What is a command? What is a code? How can you decompose a picture? What are the use of each command on Python?

	How can you write an algorithm? What is white noise? How many bits are in a byte? (8) What is the role of a code? How can you debug a program? How can you use sequence, selection, repetition, variables or inputs and outputs within a program?
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Creating media

Reception	
Year 1	What is the importance of sequencing? Which devices can you use to take a photo? How can photos be changed once they have been taken? How do you crop, resize and add a colour filter to a photo? How do you search online? What should you do if you see something that makes you uncomfortable? What does download mean? How do you use a camera? Can you follow (instructions)?
Year 2	What is an animation? What does 'stop motion' mean? How can you create a short animation? What is 'onion skinning'? What does decompose mean? What is a frame? How can you take a photo on a camera/tablet?
Year 3	What is an email? How and why do we use emails? What does being a responsible citizen mean?

	What is good about an email as a form of communication? How and why do you add attachments? What should you do if someone is unkind to you online or if you receive a 'spam' email? How can you tell if someone is being real or fake? What is media? What is a trailer? Can you name different types of media? How do sound effects and music change the effect of a video? How do we add effects and sound to a video trailer? What is a device? How do you use WeVideo? What is a sequence?
Year 4	What is a web page? What are the features of a webpage? How do you add videos and links to websites? How can we make our website informative or interactive? How should/could you present information? How do you create a webpage? What is a HTML tag? What is a line of code? How can you make some changes to a HTML code? How can you change the text size and content on a website? How can you change the HTML and CSS to alter the appearance of an object on the web? What are the components of a webpage? What is fake news and how can you identify it? How can you alter text and pictures on a webpage?
Year 5	What does animation mean? What is a frame? What does stop motion mean? What is onion skinning?

	What does decompose mean? What devices can you successfully use to make a stop motion animation? What is binary? How can computers transfer data in binary? What is a pixel? What are pixels used for? What is JPEG? How can you reduce a file size? What is the difference between ROM and RAM? What is the fetch, decode, execute cycle? What is an algorithm? How can we keep our personal information safe? What is an online community?
Year 6	What are the key features of radio play? How can you record sounds using a sound recording software? How can you add sound effects into your recording?

Data handling

Reception	How can we sort _____? What is data? How do you log in/out of a computer?
Year 1	How can data be represented? How can you type using a keyboard? Can you identify a keyboard? What is data? How can you record data? How can you sort data? What is an input?

	Can you identify an input? Can you identify a chart/table?
Year 2	How is a computer used to monitor data? How can you draw and add text to a project using your mouse and keyboard? How can you represent data? How can you create an algorithm? How is a computer used to monitor data? How can you draw and add text to a project using your mouse and keyboard? How can you represent data? How can you create an algorithm?
Year 3	What is a database? How do we compare two different values? Why is it useful to sort data? How do you filter results? When might we need to use a database? Which method of representing data would be more beneficial (chart or graph)? What are databases used for? How do you insert a chart/table? Why are digital databases easier than paper databases? Why might we need a password to protect data?
Year 4	What is data? What is a spreadsheet? How can you read data? How can you present data? How can you search on the internet? What is a search engine? What is an algorithm? How do you write an algorithm?

Year 5	How and why is data collected from space? What does 'data' and 'transmit' mean? What are the challenges of transmitting data over large distances? What is a computer network? How can networks and the internet provide multiple services? What is a 'bit'? What is binary coding? What is an input and an output? How does the size of random-access memory (RAM) affect the processing of data (CPU)?
Year 6	What is a QR code? What are the limitations of a barcode and QR code? How is data contained in a bar code? How can infrared light be used to transmit data? What is infrared? What is binary? How can RFID can be used to transmit data? What is the importance of encoding? How can you sort data on an Excel sheet? How can data become corrupted within a network? What is a 'packet'? Why is data sent in a 'packet'? What are methods of wireless data transfer? What is the difference between WiFi and mobile data? How can data analysis improve city life? How do devices be connected to the internet? What is GPS mostly used for?

Online safety

Reception	What is the internet? What should we do if we are or someone else is treated unkindly online? Who should you seek help from? How can you stay happy and safe online? What does it mean to 'share' and 'post' online? What is a digital footprint?
Year 1	What is the internet? What should we do if we are or someone else is treated unkindly online? Who should you seek help from? How can you stay happy and safe online? What does it mean to 'share' and 'post' online? What is a digital footprint?
Year 2	What is online information? What is/is not safe to share online? Who can you talk to if something makes you worried or sad? What is a password? Why do we need passwords? How can you keep your information private? Why is it important to ask for permission? What should we do if something makes us upset or scared online?
Year 3	What is a 'hoax'? What is fake news? What is news? Why shouldn't we believe everything we see on the internet? What is a fact? What is a search engine? What should we do if we are a victim of or witness cyber bullying? if we are unsure about whether to put something online who should we ask for help and advice? What are privacy settings and how/why should we set them?

	Who can you share personal information with? What could happen to your personal information if the privacy settings are no correct?
Year 4	How can we safety search for information on search engines social media and image and video sites? What is fake news? How and why do companies use 'in app purchases' and 'pop ups'? What is a fact, opinion and belief? What is a 'bot'? Why should we limit the amount of time we spend on technology? How can you be respectful online? How can you keep yourself and others safe online?
Year 5	What is the importance of keeping our passwords safe? Why do we need passwords to access apps? How to apps require permission for personal data? What are the different types of online communication? What are the positives and negatives of online communication? How can you search for people's personal information online? Why might you do this? How can you tell if someone's personal information is accurate? What are the differences between online and offline bullying? How can you help those who are being bullied?
Year 6	Can you name some scenarios where someone may feel sad, worried or uncomfortable on the internet? How can you get help on and offline? What is/is not appropriate to share online? How can you show respect to others online? What is the risk of sharing things online, even if it is sent privately? What is a positive online reputation? What strategies can you use to create an online reputation? How can you collect evidence of cyber bullying? Who should we share evidence with? Why do we need passwords? How can we create a strong password?

	What should you do if your password is shared, lost or stolen? How can you increase your privacy settings? Why should you keep your software updated?
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