

# Computing Curriculum Overview



WORKING TOGETHER TO MAKE A POSITIVE DIFFERENCE FOR EVERY CHILD

# The Curriculum – our approach

## Introduction

Our curriculum raises the ambition of our pupils. It ensures that all pupils have the chance for success, regardless of their starting points. We strive to provide meaningful experiences, allowing children to appreciate the wider world and recognise the opportunities that exist outside of our community. We have a clear focus on progression by carefully sequencing knowledge, providing clarity about what ‘getting better’ at a subject means and making explicit connections and links between the different subjects and experiences. **Key concepts, knowledge and skills** have been identified and organised into subject specific progressive objectives. These are sequenced to ensure they build and develop as pupils’ move through the school; ensuring learning becomes embedded. These progressive objectives are used to inform planning and sequences of lessons across all subjects. Clear end points are identified in all subjects and teaching and learning builds towards achieving these. The whole curriculum is underpinned by 5 Pastoral Drivers (see below). These drivers ensure we meet the holistic needs of our pupils and allow them to **REACH** their full potential.



## **Subject Specific Sequencing:**

Each subject discipline has been planned to ensure that knowledge and skills are sequenced from Early Years to Year 6.

## **Key Concepts:**

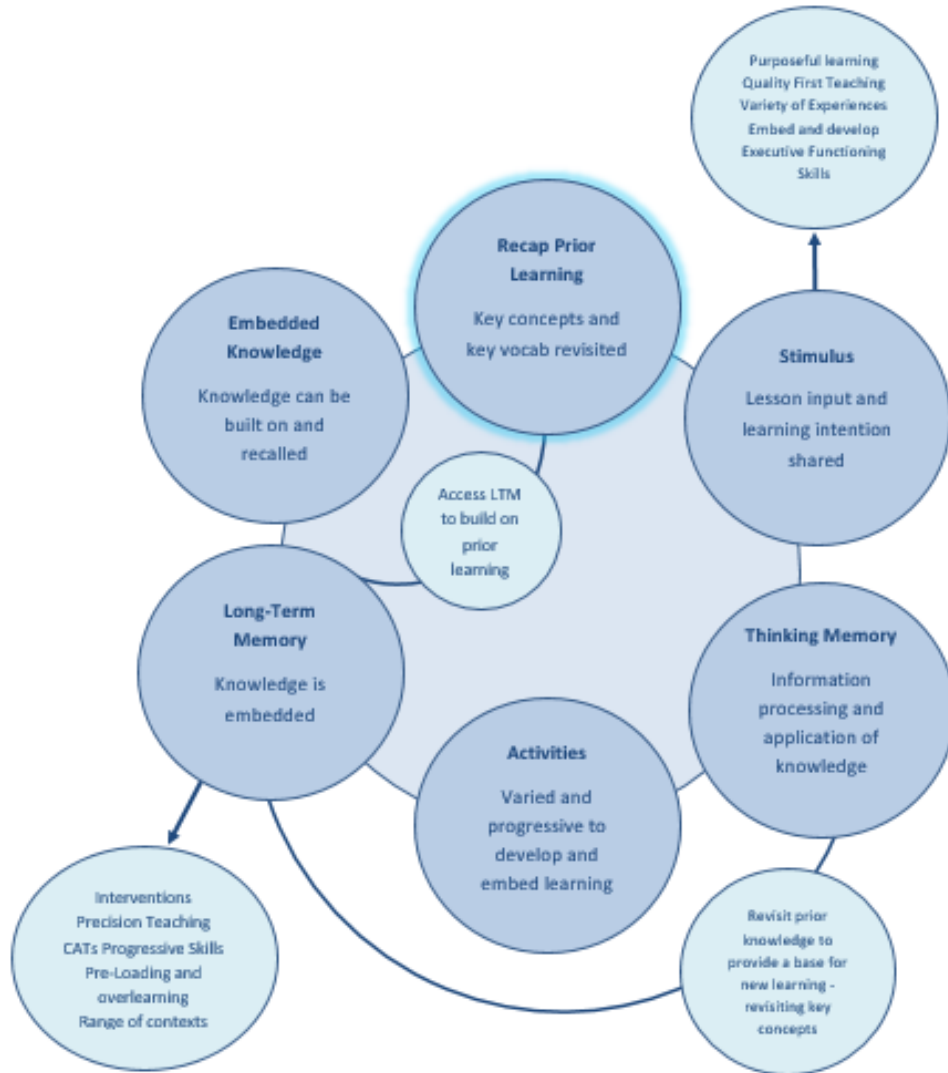
For each subject, a set of key concepts have been identified. These are the subject specific 'big ideas' that children will learn about, return to and revisit and they progress through the school. They will have opportunities to link new learning to prior knowledge within a key concept to build a rich and deep knowledge of the big ideas in each subject. Knowledge is empowering and provides a foundation for success. We accept that the more children know, the more they can learn. The subject overviews provide specific, progressive objectives that allow teachers to be precise in planning. Retrieval practice forms part of regular teaching to allow pupils to secure long-term knowledge.

## **Second Order Concepts:**

These relate to the transferable knowledge that pupils can use and apply across different curriculum subjects. For example, in all areas of the curriculum, children will build an understanding of 'significance'; learning about significant authors, artists, scientific discoveries, pieces of music, figures and events from history etc.... These are summarised on pages 8 to 10 of our whole school curriculum overview to outline how these apply across a range of subjects. They aim to develop **flexible knowledge and skills** that children can apply to multiple curriculum areas.

## Working Memory Model

With the collation of all this extensive research, we have generated a 'Working Memory Model' which enables teachers to ensure that learning is robust and that all pupils are using their interconnected schema to their full potential.



## Key concepts (Big Ideas) in **COMPUTING**

Pupils will develop their knowledge of computing through the three strands of **computer science**, **information technology** and **digital literacy**. The computing curriculum will equip pupils with the knowledge to become creators of digital technologies and digital artefacts.

**COMPUTER SCIENCE:** This focuses on programming & algorithms and data & information. This will provide pupils with the foundational knowledge needed to understand the rest of the curriculum.

### Programming



Pupils will learn how to interpret, create and evaluate algorithms. They will be taught to program to accomplish specific goals and to detect and correct errors. Pupils will implement algorithms as programs on digital devices, working with various forms of input and output. They will use sequence, selection and repetition in programs.

### Data and information



Pupils will learn how to collect, analyse, evaluate and present data and information

**INFORMATION TECHNOLOGY:** Studying this aspect will give children the knowledge of how computers are used in society. They will also explore how computers are used to create digital artefacts such as videos, animations or 3D models.

### Computer systems and networks



Pupils will learn about computer systems, networks and how they are used. They will learn about the opportunities for communication and collaboration offered by networks and how to use these services safely and respectfully. They will also learn about the internet and different types of hardware and software.

### Creating media



Pupils will learn about the design and development of digital media in different forms. They will learn how to collaborate online, evaluate online content and how to communicate, create and present content in a respectful and responsible way.


**DIGITAL LITERACY:** This is woven through the key concepts above, ensuring pupils know how to **operate devices**, how to **search and select information**, and how to use digital devices **safely and responsibly**




## Computing LTP and Key Concept Map


	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<b>EYFS</b>	<p>The EYFS is the bed rock of all subjects. Whilst there is no Technology Early Learning Goal, at Francis Askew Primary School we recognise that children require access to a range of technologies, both digital and non-digital in their early lives. Exploring with different technologies through play provides opportunities to develop skills that children will go onto develop in their lifetimes. Investigations, scientific enquiry and exploration are essential components of learning about and with technology both digitally and in the natural world. Through technology children have additional opportunities to learn across all areas in both formal and informal ways. Technologies should be seen as tools to learn both from and with, in order to integrate technology effectively within early years practice.</p>					
<b>Year 1</b>	<p><b>Computer Systems and Networks</b> 1.1 Technology around us</p>		<p><b>Project EVOLVE</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Personal and private</a></li> </ul>	<p><b>Data and Information</b> 1.4 Grouping data</p>	<p><b>Creating Media</b> 1.5 Digital Writing</p>	<p><b>Programming</b> 1.3 Moving a Robot</p>
<b>Year 2</b>	<p><b>Computer Systems and Networks</b> 2.1 IT Around Us</p>	<p><b>Creating Media</b> 2.2 Digital Photography</p>	<p><b>Project EVOLVE</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Reaching out</a></li> <li>• <a href="#">Making Choices</a></li> <li>• <a href="#">How going online makes you feel</a></li> <li>• <a href="#">Tech talk and truth</a></li> </ul>	<p><b>Data and Information</b> 2.4 Pictograms</p>		<p><b>Programming</b> 2.3 Robot Algorithms</p>
<b>Year 3</b>	<p><b>Computer Systems and Networks</b> 3.1 Connecting computers</p>	<p><b>Creating Media</b> 3.2 Stop-frame animation</p>	<p><b>Project EVOLVE</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Caring about sharing</a></li> <li>• <a href="#">I know I think I believe</a></li> <li>• <a href="#">After School Timetable</a></li> <li>• <a href="#">Identifying online profiles</a></li> </ul>	<p><b>Data and Information</b> 3.4 Branching databases</p>	<p><b>Creating Media</b> 3.3 Sequencing Sounds</p>	


			<ul style="list-style-type: none"> <li><a href="#">Password generation</a></li> </ul>			
Year 4	<b>Computer Systems and Networks</b> 4.1 The internet	<b>Project EVOLVE</b> <ul style="list-style-type: none"> <li><a href="#">Open book?</a></li> <li><a href="#">Lingo Bingo</a></li> <li><a href="#">Online monitoring</a></li> <li><a href="#">Right to reuse?</a></li> </ul>	<b>Programming</b> 4.3 Repetition in shapes	<b>Data and Information</b> 4.4 Data logging	<b>Creating Media</b> 4.2 Audio Production	<b>Project EVOLVE</b> <ul style="list-style-type: none"> <li><a href="#">Safety first</a></li> <li><a href="#">How to spot if someone is being bullied online?</a></li> </ul>
Year 5	<b>Computer Systems and Networks</b> 5.1 Sharing information		<b>Project EVOLVE</b> <ul style="list-style-type: none"> <li><a href="#">All as it seems?</a></li> <li><a href="#">Dognapped</a></li> <li><a href="#">Where's the harm in that?</a></li> <li><a href="#">Adapting use before sleep</a></li> <li><a href="#">Community Spirit</a></li> <li><a href="#">Are you a privacy pro?</a></li> </ul>	<b>Data and Information</b> 5.4 Flat-file databases	<b>Creating Media</b> 5.5 Introduction to Vector Graphics	<b>Programming</b> 5.3 Selection in Physical Computing
Year 6	<b>Computer Systems and Networks</b> 6.1 Internet communication	<b>Creating Media</b> 6.2 Webpage creation	<b>Project EVOLVE</b> <ul style="list-style-type: none"> <li><a href="#">What I know, what I share</a></li> <li><a href="#">Gaming the algorithm</a></li> <li><a href="#">Permission Mission</a></li> <li><a href="#">Age-related content</a></li> <li><a href="#">Toy Advert</a></li> </ul>	<b>Data and Information</b> 6.4 Introduction to spreadsheets		<b>Programming</b> 6.3 Variables in games


Knowledge and skills sequencing		COMPUTING						
	EYFS	Y1	Y2	Y3	Y4	Y5	Y6	
COMPUTER SCIENCE	<b>Programming</b> 	<p>Program a floor robot to follow a simple set of instructions. (N)</p> <p>Completes a simple program on an electronic device to achieve a goal (beebots). (R)</p>	<p>Understand what commands are</p> <p>Use commands to control a device</p> <p>Choose commands to achieve a goal</p> <p>Understand that a program is a set of commands</p> <p>Debug and improve programs</p> <p>Know that an algorithm is a set of instructions</p> <p><b>Suggested TeachComputing unit – Moving a robot</b></p>	<p>Understand that an algorithm is a set of instructions.</p> <p>Understand that computers read and follow algorithms without thought.</p> <p>Make predictions about programs.</p> <p>Write a program to achieve an aim.</p> <p>Debug and improve programs</p> <p><b>Suggested TeachComputing unit – Robot Algorithms</b></p>	<p>Understand that commands have outcomes.</p> <p>Write a program from a task description.</p> <p>Develop, adapt and refine a program</p> <p>Develop a process for debugging.</p> <p><b>Suggested TeachComputing unit – Sequencing sounds</b></p>	<p>Develop understanding in a <b>different environment.</b></p> <p>Use loops in programs.</p> <p>Compare infinite loops and count- controlled loops.</p> <p>Debug and improve programs</p> <p><b>Suggested TeachComputing unit – Repetition in shapes</b></p>	<p>Control a simple circuit connected to a computer.</p> <p>Design write and create a program that uses selection.</p> <p>Write programs including controlled loops.</p> <p><b>Suggested TeachComputing unit – Selection in physical computing</b></p>	<p>Understand what variables are.</p> <p>Know how to use variables in programs.</p> <p>Write a purposeful program using variables</p> <p>Debug, improve and evaluate projects</p> <p>Write code to control a device for a purpose</p> <p>Install software onto hardware</p> <p><b>Suggested TeachComputing unit – Variables in games Sensing movement</b></p>
	<p>Related digital media content: Operating devices</p>							



		EYFS	Y1	Y2	Y3	Y4	Y5	Y6
COMPUTER SCIENCE	<b>Data and information</b> 	Group objects by type. (N)  Discuss data and information and understand that things can be categorised using labels. (R)  Create tally charts. (R)	Understand that objects can be labelled and grouped.  Be able to label and group objects based on properties.  <i>Choose searches and compare groups.</i>  Debug and improve.  <b>Suggested TeachComputing unit – Grouping data</b>	Understand that data can be represented in pictograms and tally charts.  <i>Be able to present and discuss data.</i>  Draw conclusions from represented data.  <b>Suggested TeachComputing unit - Pictograms</b>	Understand that attributes can be used to refine data.  <i>Select appropriate attributes required to find desired data.</i>  Understand what a branching database is.  <i>Use a branching database to sort information.</i>  Compare branching databases/pictograms.  <b>Suggested TeachComputing unit – Branching databases</b>	Understand that data can be collected over time.  <i>Be able to use a datalogger.</i>  <i>Select what data need to be collected.</i>  Answer questions using data.  <b>Suggested TeachComputing unit – Data logging</b>	Compare paper and computer-based databases  <i>Explain that tools can be used to select specific data</i>  Apply knowledge of a database to ask and answer real-world questions  <b>Suggested TeachComputing unit – Flat-file databases</b>	Understand how spreadsheets organise data.  <i>Manipulate data sets using spread- sheets.</i>  <i>Write and use formulas.</i>  <i>Calculate using spreadsheets.</i>  <b>Suggested TeachComputing unit – An introduction to spreadsheets</b>
	Related digital media content: <i>Operating devices</i>  <i>Searching and selecting information</i>							

	EYFS	Y1	Y2	Y3	Y4	Y5	Y6	
INFORMATION TECHNOLOGY	<p><b>Computer systems and networks</b></p>  <p>Related digital media content: Operating devices</p> <p>Searching and selecting information</p> <p>Using devices safely and responsibly</p>	<p>To know that a computer has a mouse and a key-board and be able to recognise them. (N).</p> <p>To use a mouse to manipulate a program. (R)</p> <p>To use a keyboard and understand keys represent letters and numbers. (R)</p> <p>To understand that a tablet is different to a computer in some ways. (R)</p>	<p>Understand what technology is.</p> <p>Know what technology they have in their lives.</p> <p>Be able to use a mouse and a keyboard.</p> <p>Be able to open a file.</p> <p>Be able to create a typed document and save it.</p> <p><b>Suggested TeachComputing unit – Technology around us</b></p>	<p>Develop the understanding of where technology can be found in the world.</p> <p>Be able to name the types of technology found in shops, schools and at home.</p> <p>Understand why we use IT.</p> <p><b>Understand how to use IT safely.</b></p> <p><b>Suggested TeachComputing unit – Information technology around us</b></p>	<p>Understand how inputs and outputs work in digital technology and use this to achieve an aim.</p> <p>Understand why we choose to use technology.</p> <p>Understand the difference between digital and analogue outcomes.</p> <p>Begin to understand how networks connect people and how they work.</p> <p><b>Suggested TeachComputing unit – Connecting Computers</b></p>	<p>Understand how computers are physically connected in networks.</p> <p>Start to understand the role of some of the devices in a network.</p> <p>Know what the internet and WWW are and that they are different</p> <p>Understand that people create web page.</p> <p><b>Understand that not all information on the WWW is accurate.</b></p> <p><b>Suggested TeachComputing unit – The internet</b></p>	<p>Understand what a digital system is.</p> <p>Recognise the role of computer systems in our lives</p> <p>Understand that the internet forms part of some systems.</p> <p><b>Develop from the understanding of the internet to understand what the WWW is.</b></p> <p><b>Be able to carry out specific searches on the WWW.</b></p> <p>Understand how search engines work.</p> <p><b>Suggested TeachComputing unit – Systems and Searching</b></p>	<p>Know what an IP address is.</p> <p><b>Know that the internet can be used to communicate.</b></p> <p><b>Understand how systems and networks enable collaborative working.</b></p> <p><b>Be able to work collaboratively online</b></p> <p><b>Evaluate methods of online communication</b></p> <p><b>Understand how to stay safe when communicating online.</b></p> <p><b>Suggested TeachComputing unit – Communication and Collaboration</b></p>

		EYFS	Y1	Y2	Y3	Y4	Y5	Y6
INFORMATION TECHNOLOGY	<p><b>Creating media</b></p>  <p>Related digital media content: Operating devices</p>	<p>To independently listen to digital audio. (N)</p> <p>Take photographs using a digital device. (N/R)</p> <p>To record video using a digital device. (R)</p> <p>To record audio. (R)</p>	<p>Use technology purposefully to create digital content</p> <p>Select and use a range of tools</p> <p>Compare digital and paper-based content</p> <p><b>Suggested TeachComputing unit – Digital writing</b></p>	<p>Use technology purposefully to create digital content</p> <p>Produce digital content to meet a brief</p> <p>Edit and improve own pieces</p> <p><b>Suggested TeachComputing unit – Making music</b></p>	<p>Select, use and combine a variety of software on a range of devices</p> <p>Understand how to create and edit content using IT</p> <p>Use editing tools such as copy and paste to create content.</p> <p>Evaluate work produced</p> <p><b>Suggested TeachComputing unit – Stop – Frame Animation</b></p>	<p>Select, use and combine a variety of software on a range of devices</p> <p>Understand how to create and edit content using IT</p> <p>Use editing tools such to create content.</p> <p>Understand what input and output devices are.</p> <p>Evaluate work produced</p> <p><b>Suggested TeachComputing unit – Audio production</b></p>	<p>Understand what makes digital content effective.</p> <p>Create digital content for a specific purpose</p> <p>Improve and edit work produced</p> <p><b>Suggested TeachComputing unit – Introduction to vector graphics</b></p>	<p>Understand that web pages are written in HTML.</p> <p>Plan a web page design.</p> <p>Create a web page using software.</p> <p>Use navigation paths and consider effective links.</p> <p>Improve and edit work produced</p> <p><b>Suggested TeachComputing unit – Web page creation</b></p>

	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
 <p>Operating devices</p> <p>Searching and selecting information</p> <p>Using devices safely and responsibly</p>	<p>Knows how to access information on a device eg: open an app, open a link, use a QR code</p> <p>Knows to ask an adult if they want to go online</p> <p>Suggested Project Evolve lesson - Responses and reactions</p>	<p>Uses digital technology to find information</p> <p>Knows not to share personal information online</p> <p>Suggested Project Evolve lesson – Personal and Private</p>	<p>Navigates the web to complete simple searches</p> <p>Knows what personal information is and why to keep it private</p> <p>Suggested Project Evolve lesson – Making Choices</p> <p>Can say who they would go to for help if they were worried by something they saw online</p> <p>Suggested Project Evolve lesson – How Going Online Makes You Feel</p> <p>Can choose appropriate websites and avoid sites/pop ups that are not appropriate or accurate</p> <p>Suggested Project Evolve lesson – Tech Talk and Truth</p>	<p>Searches for information on the web in different ways</p> <p>Know how to access help if they are concerned about anything on social media or the internet</p> <p>Suggested Project Evolve lesson – Identifying Online Profiles</p> <p>Knows how to use technology safely, respectfully and responsibly</p> <p>Suggested Project Evolve lesson – After School Timetable</p> <p>Understands why passwords are used online and how to use them responsibly</p> <p>Suggested Project Evolve lesson – Password Generation</p>	<p>Understands that not all information on the WWW is accurate.</p> <p>Understand how to protect their identity online and how to report any concerns</p> <p>Suggested Project Evolve lesson – How to Spot If Someone is Being Bullied Online</p> <p>Knows what to do if they see inappropriate content or they are contacted by someone they do not know online</p> <p>Suggested Project Evolve lesson – Safety first</p> <p>Understands what cyberbullying is and know how to be a member of a respectful and positive online community</p> <p>Suggested Project Evolve lesson – Open Book?</p>	<p>Understands how search results are selected and ranked</p> <p>Know that there are rights and responsibilities in an online community or social network</p> <p>Know that there are rights and responsibilities when playing a game online</p> <p>Know how to stay safe when using technology to communicate with friends</p> <p>Suggested Project Evolve lesson – Community Spirit</p> <p>Know that too much screen time isn't healthy</p> <p>Suggested Project Evolve lesson – Adapting Use Before Sleep</p> <p>Knows what to do if they see inappropriate content (including pop ups) or am contacted by someone I do not know online</p> <p>Suggested Project Evolve lesson – Where's the Harm in that?</p> <p>Understands the importance of online security and how to create a secure password</p> <p>Suggested</p>	<p>Be able to carry out specific searches on the WWW.</p> <p>Understand how search engines work.</p> <p>Know some of the dangers of being 'online'</p> <p>Suggested Project Evolve lesson – Age Related content</p> <p>Know how to use technology safely and positively to communicate with their friends and family</p> <p>Suggested Project Evolve lesson – What I Know and What I Share</p> <p>Knows how to protect private information online</p> <p>Suggested Project Evolve lesson – Toy Advert</p> <p>Understands how to be respectful and responsible online as well as offline</p> <p>Suggested Project Evolve lesson – Permission Mission</p>

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<p style="writing-mode: vertical-rl; transform: rotate(180deg);">DIGITAL LITERACY</p>	 <p>Operating devices</p>	<p>Knows how to access information on a device eg: open an app, open a link, use a QR code</p>	<p>Uses digital technology to find information</p>	<p>Navigates the web to complete simple searches</p>	<p>Searches for information on the web in different ways</p>	<p>Understands that not all information on the WWW is accurate.</p>	<p>Understands how search results are selected and ranked</p>	<p>Be able to carry out specific searches on the WWW.</p>
	<p>Searching and selecting information</p> <p>Using devices safely and responsibly</p>	<p>Knows to ask an adult if they want to go online</p> <p>Suggested Project Evolve lesson - Responses and reactions</p>	<p>Knows not to share personal information online</p> <p>Suggested Project Evolve lesson – Personal and Private</p>	<p>Knows what personal information is and why to keep it private</p> <p>Suggested Project Evolve lesson – Making Choices</p> <p>Can say who they would go to for help if they were worried by something they saw online</p> <p>Suggested Project Evolve lesson – How Going Online Makes You Feel</p> <p>Can choose appropriate websites and avoid sites/pop ups that are not appropriate or accurate</p> <p>Suggested Project Evolve lesson – Tech Talk and Truth</p>	<p>Know how to access help if they are concerned about anything on social media or the internet</p> <p>Suggested Project Evolve lesson – Identifying Online Profiles</p> <p>Knows how to use technology safely, respectfully and responsibly</p> <p>Suggested Project Evolve lesson – After School Timetable</p> <p>Understands why passwords are used online and how to use them responsibly</p> <p>Suggested Project Evolve lesson – Password Generation</p>	<p>Understand how to protect their identity online and how to report any concerns</p> <p>Suggested Project Evolve lesson – How to Spot If Someone is Being Bullied Online</p> <p>Knows what to do if they see inappropriate content or they are contacted by someone they do not know online</p> <p>Suggested Project Evolve lesson – Safety first</p> <p>Understands what cyberbullying is and know how to be a member of a respectful and positive online community</p> <p>Suggested Project Evolve lesson – Open Book?</p>	<p>Know that there are rights and responsibilities in an online community or social network</p> <p>Know that there are rights and responsibilities when playing a game online</p> <p>Know how to stay safe when using technology to communicate with friends</p> <p>Suggested Project Evolve lesson – Community Spirit</p> <p>Know that too much screen time isn't healthy</p> <p>Suggested Project Evolve lesson – Adapting Use Before Sleep</p> <p>Knows what to do if they see inappropriate content (including pop ups) or am contacted by someone I do not know online</p> <p>Suggested Project Evolve lesson – Where's the Harm in that?</p> <p>Understands the importance of online security and how to create a secure password</p> <p>Suggested</p>	<p>Understand how search engines work.</p> <p>Know some of the dangers of being 'online'</p> <p>Suggested Project Evolve lesson – Age Related content</p> <p>Know how to use technology safely and positively to communicate with their friends and family</p> <p>Suggested Project Evolve lesson – What I Know and What I Share</p> <p>Knows how to protect private information online</p> <p>Suggested Project Evolve lesson – Toy Advert</p> <p>Understands how to be respectful and responsible online as well as offline</p> <p>Suggested Project Evolve lesson – Permission Mission</p>

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