

Computing Skills and Knowledge Progression



Subject Domain - through Purple Mash	YEAR 1	YEAR 2
<p>Algorithms & Coding</p>	<p>Coding –</p> <ul style="list-style-type: none"> • Children can explain what coding means. • Children know that for the computer to make something happen, it needs to follow clear instructions. • Children can explain what a block of code is. • Children can read through combined blocks of code. • Children can use the drop-down menu to change backgrounds and characters. • Children can design a simple program and then create the program using 2Code. • Children can program a character to move given a variety of input events. <p>Lego Builders –</p> <ul style="list-style-type: none"> • Children know that to achieve the effect they want when building something, they need to follow accurate instructions. • Children know that by following the instructions correctly, they will get the correct result. • Children know that an algorithm is a precise, step-by-step set of instructions used to solve a problem or achieve an objective. • Children can follow instructions in a simple computer program. • Children know that computers need precise instructions to follow. • Children know that an algorithm written for a computer to follow is called a program. • Children know that correcting errors in an algorithm or program is called 'debugging'. 	<p>Coding –</p> <ul style="list-style-type: none"> • Children can explain that an algorithm is a set of instructions. • Children can describe the algorithms they created. • Children can explain that for the computer to make something happen, it needs to follow clear instructions. • Children are beginning to understand that the Repeat and Timer commands both make objects repeat actions but function differently and the type of object can affect which is the best command to use. • Children can explain what debug (debugging) means. • Children have a clear idea of how to use a design document to start debugging a program. • Children can debug simple programs. • Children can create a computer program using different objects. • Children can plan and use algorithms in programs successfully to achieve a result. • Children can plan and use algorithms in programs successfully to achieve the desired a result. • Children can code a program using a variety of objects, actions, events and outputs successfully.

	<p>Maze Explorers –</p> <ul style="list-style-type: none"> • Children know how to use the direction keys in 2Go to move forwards, backwards, left and right. • Children know how to undo their last move. • Children can use diagonal direction keys to move the characters in the right direction. • Children know how to create a simple algorithm. • Children know how to debug their algorithm. • Children can use the additional direction keys to create a new algorithm. 	
<p>Data and Data Representation</p>	<p>Grouping & Sorting –</p> <ul style="list-style-type: none"> • Children use Purple Mash activities to sort various items online using a variety of criteria. <p>Pictograms –</p> <ul style="list-style-type: none"> • Children use illustrations to create a simple pictogram. • Children can contribute to a class pictogram and can discuss what the pictogram shows. • Children can represent the results as a pictogram. <p>Spreadsheets –</p> <ul style="list-style-type: none"> • Children can navigate around a spreadsheet. • Children can explain what rows and columns are. • Children can save and open sheets. • Children can enter data into cells. • Children can open the Image toolbox and find and add clipart. • Children can use the ‘move cell’ tool so that images can be dragged around the spreadsheet. • Children can use the ‘lock’ tool to prevent changes to cells. • Children can give images a value that the spreadsheet can use to count them. • Children can add the count tool to count items. • Children can add the speak tool so that the items are counted out loud. • Children can use a spreadsheet to help work out a fair way to share items. 	<p>Questioning –</p> <ul style="list-style-type: none"> • Children understand that the information on pictograms cannot be used to answer more complicated questions. • Children have used a range of yes/no questions to separate different items. • Children understand what is meant by a binary tree. • Children have designed a binary tree to sort pictures of children. • Children understand that questions are limited to ‘yes’ and ‘no’ in a binary tree. • Children understand what is meant by a database. • Children have used a database to answer simple and more complex search questions <p>Spreadsheets –</p> <ul style="list-style-type: none"> • Children can explain what rows and columns are in a spreadsheet. • Children can open, save and edit a spreadsheet. • Children can add images from the image toolbox and allocate them a value. • Children can add the count tool to count items. • Children can use copying a pasting to help make spreadsheets. • Children can use tools in a spreadsheet to automatically total rows and columns. • Children can use a spreadsheet to solve a mathematical puzzle. Children can use images in a


		<p>spreadsheet.</p> <ul style="list-style-type: none"> • Children can work out how much they need to pay using coins by using a spreadsheet to help calculate. • Children can create a table of data on a spreadsheet. • Children can use the data to create a block graph manually.
<p>Programming and Development & Hardware and Processing</p>	<p>Animated Story Books –</p> <ul style="list-style-type: none"> • Children know the difference between a traditional book and an e-book. • Children can use the different drawing tools to create a picture on the page. • Children can add text to a page and change the colour, font and size of the text. • Children can save their work. • Children can open work that they saved in my last lesson. • Children can add an animation to their picture. • Children can play the pages they have created. • Children can save their changes and overwrite the file. • Children can add a sound to the page. • Children can copy and paste a page in the book. 	<p>Creating Pictures –</p> <ul style="list-style-type: none"> • Children can explain what is meant by impressionist art. • Children can use 2Paint a Picture to create their own art based upon this style. • Children can use 2Paint a Picture to create their own art based upon this style. • Children can use 2Paint a Picture to create their own art based upon his style. • Children can use 2Paint a Picture to create their own art by repeating patterns in a variety of ways. • Children can combine more than one effect in 2Paint a Picture to enhance their patterns. • Children can use the eCollage function in 2Paint a Picture to create their own surrealist art using drawing and clipart. <p>Making Music –</p> <ul style="list-style-type: none"> • Children understand what 2Sequence is and how it works. • Children have used the different sounds within 2Sequence to create a tune. • Children have explored how to speed up and slow down tunes. • Children understand what happens to the tune when sounds are moved. • Children can change the volume of the background sounds. • Children can create two tunes which depict two feelings. • Children have uploaded and used their own sound chosen from a bank of sounds.

		<ul style="list-style-type: none"> • Children have created, uploaded and used their own recorded sound. • Children have created their own tune using some of the chosen sounds.
<p>Communication and Information Technology</p>	<p>Online Safety –</p> <ul style="list-style-type: none"> • Children can login to Purple Mash using their own login. • Children are beginning to develop an understanding of ownership of work online. • Children can save work into the My Work folder in Purple Mash and understand that this is a private saving space just for their work. • Children can find their saved work in the Online Work area of Purple Mash. • Children can explore the Tools section on Purple Mash and become familiar with some of the key icons, save, print, open and new. • Children can logout of Purple Mash when they have finished using it and know why that is important. <p>Technology outside school –</p> <ul style="list-style-type: none"> • Children understand what is meant by ‘technology’. • Children have considered types of technology used in school and out of school. • Children have recorded 4 examples of where technology is used away from school. 	<p>Online Safety –</p> <ul style="list-style-type: none"> • Children can share the work they have created to a display board. • Children understand that the teacher approves work before it is displayed. • Children have discussed their own experiences and understanding of what email is used for. • Children can explain what a digital footprint is. • Children can give examples of things that they wouldn’t want to be in their digital footprint. <p>Effective searching –</p> <ul style="list-style-type: none"> • Children can recall the meaning of key internet terms. • Children have completed a quiz about the internet. • Children can identify basic parts of a web search engine search page. • Children have learnt to read a web search results page. • Children can search for answers to a quiz on the Internet. • Children have created a leaflet to consolidate their knowledge of effective Internet searching. <p>Presenting Ideas -</p> <ul style="list-style-type: none"> • Children have examined a traditional tale presented as a mind map, as a quiz, as an e-book and as a fact file. • Children know that digital content can be represented in many forms. • Children can talk about their work and make improvements to solutions based on feedback

		<p>received. Children know that data can be structured in tables to make it useful.</p> <ul style="list-style-type: none"> • Children can use a variety of software to manipulate and present digital content and information. • Children can collect, organise and present data and information in digital content. • Children can create digital content to achieve a given goal by combining software packages.
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Computing Skills and Knowledge Progression



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	YEAR 3	YEAR 4
Algorithms & Coding	<p>Coding -</p> <ul style="list-style-type: none"> • Children can create a design that represents a sequential algorithm. • Children can use a flowchart design to create the code. • Children can explain what Object, Action, Output, Control and Event are in computer programming. • Children can explain how their program simulates a physical system, i.e. my vehicles move at different speeds and angles. • Children can make use of the X and Y properties of objects in their coding. • Children can create an 'If' statement in their program. • Children can use a timer and if statement to introduce selection in their program. • Children can explain what a variable is in programming. • Children can explain why variables need to be named. • Children can create a variable in a program. • Children can set/change the variable values appropriately to create a timer. 	<p>Coding -</p> <ul style="list-style-type: none"> • Children can use sketching to design a program and reflect upon their design. • Children can create code that conforms to their design. • Children can create an 'If/else' statement. • Children understand what a variable is in programming. • Children can set/change the variable values appropriately. • Children can interpret a flowchart that depicts an if/else flowchart. • Children can show how a character repeats an action and explain how they caused it to do so. • Children can make a character respond to user keyboard input. • Children can explain what a variable is when used in programming. • Children can create a timer that prints a new number to the screen every second. • Children can explain how they made their program

	<ul style="list-style-type: none"> • Children are beginning to understand how the use of the timer differs from the repeat command and can experiment with the different methods of repeating blocks of code. • Children can explain how they made objects repeat actions. • Children have a clear idea of how to use a design document to start debugging a program. • Children can debug simple programs. Children can explain why it is important to save their work after each functioning iteration of the program they are making. 	<ul style="list-style-type: none"> change the number every second. • Children can create an algorithm modelling the sequence of a simple event. • Children can manipulate graphics in the design view to achieve the desired look for the program. • Children can use an algorithm when making a simulation of an event on the computer. <ul style="list-style-type: none"> • Children can recognise the need to start coding at a basic level of abstraction to remove superfluous details from their program that do not contribute to the aim of the task. <p>Logo –</p> <ul style="list-style-type: none"> • Children know what the different instructions are in Logo and how to type them. • Children can follow simple Logo instructions to create shapes on paper. • Children can follow simple instructions to create shapes in Logo. • Children can create Logo instructions to draw letters of increasing complexity. • Children can write Logo instructions for a word of four letters. • Children can create shapes using the Repeat function. • Children can find the most efficient way to draw shapes. • Children can use the Build feature. • Children can create ‘flowers’ using Logo.
<p>Data and Data Representation</p>	<p>Spreadsheets –</p> <ul style="list-style-type: none"> • Children can create a table of data on a spreadsheet. Children can use a spreadsheet program to automatically create charts and graphs from data. • Children can use the ‘more than’, ‘less than’ and ‘equals’ tools to compare different numbers and help to work out solutions to sums. • Children can use the ‘spin’ tool to count through times tables. <ul style="list-style-type: none"> • Children can describe a cell location in a spreadsheet using the notation of a letter for the column followed by a number for the row. 	<p>Spreadsheets –</p> <ul style="list-style-type: none"> • Children can use the number formatting tools within 2Calculate to appropriately format numbers. • Children can add a formula to a cell to automatically make a calculation in that cell. <ul style="list-style-type: none"> • Children can use the timer, random number and spin button tools. • Children can combine tools to make fun ways to explore number. <ul style="list-style-type: none"> • Children can use a series of data in a spreadsheet to create a line graph. • Children can use a line graph to find out when the

	<ul style="list-style-type: none"> Children can find specified locations in a spreadsheet. <p>Branching Databases -</p> <ul style="list-style-type: none"> Children understand how YES/NO questions are structured and answered. <ul style="list-style-type: none"> Children can select and save appropriate images. Children can create a branching database. Children know how to use and debug their own. Children have contributed to a class branching database. <ul style="list-style-type: none"> Children have completed a branching database. <p>Graphing –</p> <ul style="list-style-type: none"> Children can set up a graph with a given number of fields. Children can enter data for a graph. Children can produce and share graphs made on the computer. Children can present the results in a range of graphical formats. 	<p>temperature in the playground will reach 20°C.</p> <ul style="list-style-type: none"> Children can make practical use of a spreadsheet to help them plan actions. Children can use the currency formatting in 2Calculate. Children can allocate values to images and use these to explore place value. Children can use a spreadsheet made in 2Calculate to check their understanding of a mathematical concept.
<p>Programming and Development & Hardware and Processing</p>	<p>Touch typing –</p> <ul style="list-style-type: none"> Children understand the names of the fingers. Children understand what is meant by ‘top row’, ‘home row’, ‘bottom row’ and ‘space bar’. <ul style="list-style-type: none"> Children can use two hands to type the letters on the keyboard. Children can type full words using the correct fingering. Children can type a series of words with speed and accuracy. <p>Simulations –</p> <ul style="list-style-type: none"> Children know that a computer simulation can represent real and imaginary situations. Children can give some examples of simulations used for fun and for work. Children can give suggestions of advantages and problems of simulations. 	<p>Animation -</p> <ul style="list-style-type: none"> Children have put together a simple animation using paper to create a flick book. Children have an understanding of animation ‘frames’. Children have made a simple animation using 2Animate. Children know what the Onion Skin tool does in animation. Children can use the Onion Skin tool to create an animated image. Children can use backgrounds and sounds to make more complex and imaginative animations. Children know what stop motion animation is and how it is created. Children have used ideas from existing stop motion films to recreate their own animation.

	<ul style="list-style-type: none"> • Children can explore a simulation. • Children can use a simulation to try out different options and to test predictions. • Children can begin to evaluate simulations by comparing them with real situations and considering their usefulness. <ul style="list-style-type: none"> • Children can recognise patterns within simulations and make and test predictions. • Children can identify the relationships and rules on which the simulations are based and test their predictions. • Children can evaluate a simulation to determine its usefulness for purpose. 	<p>Hardware Investigators –</p> <ul style="list-style-type: none"> • Children can name the different parts of a desktop computer. • Children know what the function of the different parts of a computer is.
<p>Communication and Information Technology</p>	<p>Online Safety –</p> <ul style="list-style-type: none"> • Children can contribute to a concept map of all the different ways they know that the Internet can help us to communicate. • Children understand what makes a good password for use on the Internet. Children are beginning to realise the outcomes of not keeping passwords safe. • Children have contributed to a class blog with clear and appropriate messages. <ul style="list-style-type: none"> • Children understand that some information held on websites may not be accurate or true. • Children are beginning to understand how to search the Internet and how to think critically about the results that are returned. • Children have accessed and assessed a ‘spoof’ 	<p>Online Safety –</p> <ul style="list-style-type: none"> • Children know that security symbols such as a padlock protect their identity online. • Children know the meaning of the term ‘phishing’ and are aware of the existence of scam websites. • Children can explain what a digital footprint is and how it relates to identity theft. <ul style="list-style-type: none"> • Children can give examples of things that they wouldn’t want to be in their digital footprint. • Children can identify possible risks of installing free and paid for software. • Children know that malware is software that is specifically designed to disrupt, damage, or gain access to a computer.

- website.
- Children have created their own 'spoof' webpage mock-up.
- Children have shared their 'spoof' web page on a class display board.
 - Children can identify some physical and emotional effects of playing/watching inappropriate content/games.
 - Children relate cyberbullying to bullying in the real-world and have strategies for dealing with online bullying including screenshot and reporting.

Emailing –

- Children can list a range of different ways to communicate.
 - Children can open an email and respond to it.
 - Children have sent emails to other children in the class.
 - Children have written rules about how to stay safe using email.
 - Children can attach work to an email.
- Children know what CC means and how to use it.
 - Children can read and respond to a series of email communications.
 - Children can attach files appropriately and use email communication to explore ideas.

- Children know what a computer virus is.
- Children are able to determine whether activities that they undertake online, infringe another's' copyright. They know the difference between researching and using information and copying it
- Children know about citing sources that they have used.
- Children consider the reliability of the source of information when looking online.
 - Children are able to take more informed ownership of the way that they choose to use their free time. They recognise a need to find a balance between being active and digital activities.
 - Children can give reasons for limiting screen time.

Writing for Different Audiences -

- Children have looked at and discussed a variety of written material where the font size and type are tailored to the purpose of the text.
 - Children have used text formatting to make a piece of writing fit for its audience and purpose.
- Children have interpreted a variety of incoming communications and used these to build up the details of a story.
- Children have used the incoming information to write their own newspaper report.
 - Children have used 2Connect to mind-map ideas for a community campaign.
 - Children have assessed their texts using criteria to judge their suitability for the intended audience.

Effective searching –

- Children can structure search queries to locate specific information.
- Children have used search to answer a series of questions.
- Children have written search questions for a friend to solve.
- Children can analyse the contents of a web page for clues about the credibility of the information.

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	YEAR 5	YEAR 6
Algorithms & Coding	<p>Coding -</p> <ul style="list-style-type: none"> • Children can use sketching to design a program and reflect upon their design. • Children can create code that conforms to their design. Children can explain how their program simulates a physical system. • Children can select the relevant features of a situation to incorporate into their simulation by using decomposition and abstraction. • Children can reflect upon the effectiveness of their simulation. <ul style="list-style-type: none"> • Children can explain what a variable is in programming. • Children can set/change the variable values appropriately. • Children know some ways that text variables can be used in coding. • Children can create a game which has a timer and score pad. • Children can use variables to control the objects in the game. • Children can create loops using the timer and If/else statements. <ul style="list-style-type: none"> • Children can include buttons and objects that launch windows to websites and programs. • Children can code a program that informs others. 	<p>Coding –</p> <ul style="list-style-type: none"> • Children can plan a program before coding to anticipate the variables that will be required to achieve the desired effect. • Children can follow through plans to create the program. • Children can debug when things do not run as expected. • Children can explain what functions are and how they can be created and labelled in 2Code. • Children can explain how to move code from one tab to another in 2Code. • Children can explain how they organised code in a program into functions to make it easier to read. • Children can code programs that take text input from the user and use this in the program. • Children can attribute variables to user input. • Children are aware of the need to code for all possibilities when using user input. • Children can follow flowcharts to create and debug code. • Children can create flowcharts for algorithms using 2Chart. • Children can be creative with the way they code to generate novel visual effects. • Children can follow through the code of how a text adventure can be programmed in 2Code. • Children can adapt an existing text adventure to make it unique to their requirements.
Data and Data	<p>Spreadsheets -</p> <ul style="list-style-type: none"> • Children can create a formula in a spreadsheet to convert m to cm. 	<p>Spreadsheets –</p> <ul style="list-style-type: none"> • Children can create a spreadsheet to answer a mathematical question relating to probability.

Representation

- Children can apply this to creating a spreadsheet that converts miles to km and vice versa.
 - Children can use a spreadsheet to work out which letters appear most often.
 - Children can use the 'how many' tool.
 - Children can use a spreadsheet to work out the area and perimeter of rectangles.
 - Children can use these calculations to solve a real-life problem.
 - Children can create simple formulae that use different variables.
 - Children can create a formula that will work out how many days there are in x number of weeks or years.
 - Children can use a spreadsheet to model a real-life situation and come up with solutions that can be practically applied.

Databases –

- Children understand the different ways to search a database.
- Children can search a database in order to answer questions correctly.
- Children have designed an avatar for a class database.
- Children have successfully entered information into a class database.
- Children can create their own database on a chosen topic.
- Children can add records to their database.
- Children know what a database field is and can correctly add field information.
- Children understand how to word questions so that they can be effectively answered using a search of their database.

- Children can take copy and paste shortcuts.
- Children can problem solve using the count tool.
- Children can use a spreadsheet to model a real-life situation and come up with solutions.
- Children can make practical use of a spreadsheet to help plan actions.
- Children can create a machine to help work out the price of different items in a sale.
- Children can use the formula wizard to create formulae.
- Children can use a spreadsheet to solve a problem.
- Children can use a spreadsheet to model a real-life situation and come up with solutions that can be applied to real life.

Programming and Development & Hardware and Processing

Game Creator -

- Children can review and analyse a computer game.
- Children can describe some of the elements that make a successful game.
- Children can begin the process of designing their own game.
- Children can design the setting for their game so that it fits with the selected theme.
- Children can upload images or use the drawing tools to create the walls, floor and roof.
- Children can design characters for their game.
- Children can decide upon, and change, the animations and sounds that the characters make.
- Children can make their game more unique by selecting the appropriate options to maximise the playability.
- Children can write informative instructions for their game so that other people can play it.
- Children can evaluate their own and peers' games to help improve their design for the future.

3D Modelling –

- Children know what the 2Design and Make tool is for.
- Children have explored the different viewpoints in 2Design and Make whilst designing a building.
- Children have adapted one of the vehicle models by moving the points to alter the shape of the vehicle while still maintaining its form.
Children have explored how to edit the polygon 3D models to design a 3D model for a purpose.
- Children have refined one of their designs to prepare it for printing.
- Children have printed their design as a 2D net and then created a 3D model.
- Children have explored the possibilities.

Text Adventures –

- Children can map out a story-based text adventure.
- Children can use 2Connect to record their ideas.
- Children can use the full functionality of 2Create a Story Adventure mode to create, test and debug using their plan.
- Children can split their adventure-game design into appropriate sections to facilitate creating it.
- Children can map out an existing text adventure.
- Children can contrast a map-based game with a sequential story-based game.
- Children can create their own text-based adventure based upon a map.
- Children can use coding concepts of functions, two-way selection (if/else statements) and repetition in conjunction with one another to code their game.
 - Children make logical attempts to debug their code when it does not work correctly.

Quizzing –

- Children have used the 2DIY activities to create a picture-based quiz.
- Children have considered the audience's ability level and interests when setting the quiz.
- Children have shared their quiz and responded to feedback.
- Children understand the different question types within 2Quiz.
- Children have ideas about what sort of questions are best suited to the different question types.
- Children have used 2Quiz to make and share a science quiz.
- Children have considered the audience's ability level and interests when setting the quiz.
- Children have shared their quiz with peers.
- Children have given and responded to feedback.
- As a class, children have collaborated on a quiz.
- Children have tried out the different types of Text Toolkit grammar games.
- Children have chosen an appropriate Text Toolkit tool to make their own grammar game.
 - Children have used a 2Investigate quiz to answer quiz questions.

		<ul style="list-style-type: none"> • Children have designed their own quiz based on one of the 2Investigate example databases. • Children have used their knowledge of quiz types to create a quiz show quiz based on a curriculum area.
<p>Communication and Information Technology</p>	<p>Online Safety –</p> <ul style="list-style-type: none"> • Children know what Childnet SMART CREW is and have thought critically about the information that they share online both about themselves and others. • Children know who to tell if they are upset by something that happens online. • Children can use the SMART rules as a source of guidance when online. • Children think critically about what they share online, even when asked by a usually reliable person to share something. • Children have clear ideas about good passwords. • Children can see how they can use images and digital technology to create effects not possible without technology. • Children have experienced how image manipulation could be used to upset them or others even using simple, freely available tools and little specialist knowledge. • Children can cite all sources when researching and explain the importance of this. • Children select keywords and search techniques to find relevant information and increase reliability • Children show an understanding of the advantages and disadvantages of different forms of communication and when it is appropriate to use each. <p>Concept Maps –</p> <ul style="list-style-type: none"> • Children can see the importance of recording concept 	<p>Online safety -</p> <ul style="list-style-type: none"> • Children have used the example game and further research to refresh their memories about risks online including sharing location, secure websites, spoof websites, phishing and other email scams. • Children have used the example game and further research to refresh their memories about the steps they can take to protect themselves including protecting their digital footprint, where to go for help, smart rules and security software. • Children understand how what they share impacts upon themselves and upon others in the long-term. • Children know about the consequences of promoting inappropriate content online and how to put a stop to such behaviour when they experience it or witness it as a bystander. • Children can take more informed ownership of the way that they choose to use their free time. They recognise a need to find a balance between being active and digital activities. • Children can give reasons for limiting screen time. • Children can talk about the positives and negative aspects of technology and balance these opposing views. <p>Blogging -</p> <ul style="list-style-type: none"> • Children understand how a blog can be used as an

maps visually.

- Children understand what is meant by 'concept maps', 'stage', 'nodes' and 'connections'.
- Children can create a basic concept map.
- Children have used 2Connect Story Mode to create an informative text.
- Children have used 2Connect collaboratively to create a concept map.
- Children have used Presentation Mode to present their concept maps to an audience.

informative text.

- Children understand the key features of a blog.
- Children can create a blog with a specific purpose.
- Children understand that the way in which information is presented has an impact upon the audience.
- Children understand that blogs need to be updated regularly to maintain the audience's interest and engagement. Children can work collaboratively to plan a blog.
 - Children can post comments and blog posts to an existing class blog.
 - Children understand the approval process that their posts go through and demonstrate an awareness of the issues surrounding inappropriate posts and cyberbullying.
 - Children can comment on and respond to other blogs.
 - Children can assess the effectiveness and impact of a blog.

Networks –

- Children know the difference between the WorldWide Web and the internet.
 - Children know about their school network.
 - Children have considered some of the major changes in technology which have taken place during their lifetime and the lifetime of their teacher/another adult.