Computing

Colton Primary School

Progression map

Curriculum intent

We live in an ever-changing world. Technology is moving forward at a pace that is difficult to predict. We have to fit our children for a technological world that, as yet, does not exist. Technology is changing the lives of everyone. Through teaching Computing, we equip children to participate in a rapidly-changing world where work and leisure activities are increasingly transformed by technology.

We want our children to find, explore, analyse, exchange and present information from and in a range of sources and media. In a world of fake news and misinformation we aim to focus on developing the skills necessary for children to be able to use information in a discriminating and effective way. We want children to know more, remember more and understand more in computing so that they leave primary school computer literate. We know that the jobs of the future will be heavily based in the Computing sector and it is a priority of ours to ensure our children get the best start on this path.

Colton Primary Computing Taught

Year group	Autumn Term	Spring Term	Summer Term
1	Technology Around Us & Digital Painting	Moving a Robot & Grouping Data	Digital Writing & Programming animation
2	Information Technology around us & Digital Photography	Robot Algorithms and Pictograms	Making Music and Programming Quizzes
3	Connecting Computers & Stop Frame Animation	Sequencing sounds & Branching Databases	Desktop Publishing & Events and Actions in Programs
4	The Internet & Audio Production	Repetition in Shapes & Data Logging	Photo Editing & Repetition in Games
5	Sharing Information & Video Production	Selection In Physical Computing & Flat-File Databases	Vector Drawing & Selection in Quizzes
6	Internet Communication & Webpage Creation	Variables In Games & Introduction To Spreadsheets	3D Modelling & Sensing

Progression of knowledge and skills in Computing

YEAR GROUP	Computing opportunities throughout the year in EYFS	
Computing in our EYFS is centred around play-based, unplugged activities that focus on building children's listening skills, curiosity, and creative problem solving.		
EYFS	**Nursery**	**Reception**
	Using SMART boards Using programmable toys such as Beebots Watching online clips.	Take a photograph with a camera or iPad Searching for information on the internet Playing games on the interactive whiteboard Exploring old typewriters and mechanical toys Using a beebot Watching online video clips Listening to music and audiobooks

Strand	Y1	Y2	Y3
Computing Systems and Networks	- I can explain how these technology examples help us - I can explain technology as something that helps us - I can locate examples of technology in the classroom - I can name the main parts of a computer - I can switch on and log into a computer - I can use a mouse to click and drag - I can click and drag to make objects on a screen - I can use a mouse to create a picture - I can use a mouse to open a program - I can save my work to a file - I can say what a keyboard is for - I can type my name on a computer - I can delete letters - I can open my work from a file - I can use the arrow keys to move the cursor - I can discuss how we benefit from these rules - I can give examples of some of these rules - I can identify rules to keep us safe and healthy when we are using technology in and beyond the home	- I can describe some uses of computers - I can identify examples of computers - I can identify that a computer is a part of IT - I can identify examples of IT - I can identify that some IT can be used in more than one way - I can sort school IT by what it's used for - I can find examples of information technology - I can sort IT by where it is found - I can talk about uses of information technology - I can demonstrate how IT devices work together - I can recognise common types of technology - I can say why we use IT - I can list different uses of information technology - I can say how rules can help keep me safe - I can talk about different rules for using IT - I can explain the need to use IT in different ways - I can identify the choices that I make when using IT - I can use IT for different types of activities	- I can explain that digital devices accept inputs - I can explain that digital devices produce outputs - I can follow a process - I can classify input and output devices - I can describe a simple process - I can design a digital device - I can explain how I use digital devices for different activities - I can recognise similarities between using digital devices and non-digital tools - I can suggest differences between using digital devices and non-digital tools - I can discuss why we need a network switch - I can explain how messages are passed through multiple connections - I can recognise different connections - I can demonstrate how information can be passed between devices - I can explain the role of a switch, server, and wireless access point in a network - I can recognise that a computer network is made up of a number of devices - I can identify how devices in a network are connected together - I can identify networked devices around me - I can identify the benefits of computer networks
Sticky Knowledge	What is a mouse? What device would I use to write on a Computer? Which key deletes letters? What is the name of the arrow on the screen	What are computers used for? What does the interactive whiteboard do? Why don't we share passwords? Name three types of IT you have in school	What is an input? How is an iPad pencil different from a classroom pencil? What does a wireless access point do? Name three things on the school network

Creating Media			
	- I can draw lines on a screen and explain which tools I used - I can make marks on a screen and explain which tools I used - I can use the paint tools to draw a picture - I can make marks with the square and line tools - I can use the shape and line tools effectively - I can use the shape and line tools to recreate the work of an artist - I can choose appropriate shapes - I can create a picture in the style of an artist - I can make appropriate colour choices - I can choose appropriate paint tools and colours to recreate the work of an artist - I can say which tools were helpful and why - I know that different paint tools do different jobs - I can change the colour and brush sizes - I can make dots of colour on the page - I can use dots of colour to create a picture in the style of an artist on my own - I can explain that pictures can be made in lots of different ways - I can say whether I prefer painting using a computer or using paper - I can spot the differences between painting on a computer and on paper	- I can explain what I did to capture a digital photo - I can recognise what devices can be used to take photographs - I can talk about how to take a photograph - I can explain the process of taking a good photograph - I can explain why a photo looks better in portrait or landscape format - I can take photos in both landscape and portrait format - I can discuss how to take a good photograph - I can identify what is wrong with a photograph - I can improve a photograph by retaking it - I can experiment with different light sources - I can explain why a picture may be unclear - I can explore the effect that light has on a photo - I can explain my choices - I can recognise that images can be changed - I can use a tool to achieve a desired effect - I can apply a range of photography skills to capture a photo - I can identify which photos are real and which have been changed - I can recognise which photos have been changed	- I can create an effective flip book—style animation - I can draw a sequence of pictures - I can explain how an animation/flip book works - I can create an effective stop-frame animation - I can explain why little changes are needed for each frame - I can predict what an animation will look like - I can break down a story into settings, characters and events - I can create a storyboard - I can describe an animation that is achievable on screen - I can evaluate the quality of my animation - I can review a sequence of frames to check my work - I can use onion skinning to help me make small changes between frames - I can evaluate another learner's animation - I can explain ways to make my animation better - I can improve my animation based on feedback - I can add other media to my animation - I can evaluate my final film - I can explain why I added other media to my animation
Sticky Knowledge	What could you use to draw on screen? Name two tools in paint How is painting on screen different to painting on paper? Which tool would remove work in paint?	What hardware allows us to take pictures? When would we use portrait rather than landscape? How does a filter change a photograph? What effect does light have on a photograph?	What is stop-motion animation? Why would you need to use a storyboard? What is onion skinning? Name three tips for creating good stop motion movies

Programming - A	- I can match a command to an outcome - I can predict the outcome of a command on a device - I can run a command on a device - I can follow an instruction - I can give directions - I can recall words that can be acted out - I can compare forwards and backwards movements - I can predict the outcome of a sequence involving forwards and backwards commands - I can start a sequence from the same place - I can compare left and right turns - I can experiment with turn and move commands to move a robot - I can predict the outcome of a sequence involving up to four commands - I can choose the order of commands in a sequence - I can debug my program - I can explain what my program should do - I can identify several possible solutions - I can plan two programs - I can use two different programs to get to the same place	- I can choose a series of words that can be enacted as a sequence - I can follow instructions given by someone else - I can give clear and unambiguous instructions - I can create different algorithms for a range of sequences (using the same commands) - I can show the difference in outcomes between two sequences that consist of the same commands - I can use an algorithm to program a sequence on a floor robot - I can compare my prediction to the program outcome - I can follow a sequence - I can predict the outcome of a sequence - I can explain the choices I made for my mat design - I can identify different routes around my mat - I can test my mat to make sure that it is usable - I can create an algorithm to meet my goal - I can explain what my algorithm should achieve - I can use my algorithm to create a program - I can plan algorithms for different parts of a task - I can put together the different parts of my program - I can test and debug each part of the program	- I can explain that objects in Scratch have attributes (linked to) - I can identify the objects in a Scratch project (sprites, backdrops) - I can recognise that commands in Scratch are represented as blocks - I can choose a word which describes an on-screen action for my plan - I can create a program following a design - I can identify that each sprite is controlled by the commands I choose - I can create a sequence of connected commands - I can explain that the objects in my project will respond exactly to the code - I can start a program in different ways - I can combine sound commands - I can explain what a sequence is - I can order notes into a sequence - I can build a sequence of commands - I can decide the actions for each sprite in a program - I can make design choices for my artwork - I can identify and name the objects I will need for a project - I can implement my algorithm as code - I can relate a task description to a design
Sticky Knowledge	How can you make the device move forwards? Why is the order of your commands important? What is debugging? What command could make the device turn?	Why do your commands have to be clear? What is debugging? What is an algorithm? Why is it important to test your program?	What do the blocks in scratch represent? Can you think of two different ways to start a program? What is code? What is debugging?

Creating Media	- I can identify and find keys on a keyboard - I can open a word processor - I can recognise keys on a keyboard - I can enter text into a computer - I can use backspace to remove text - I can use letter, number, and space keys - I can explain what the keys that I have learnt about already do - I can identify the toolbar and use bold, italic, and underline - I can type capital letters - I can change the font- I can select all of the text by clicking and dragging- I can select a word by double-clicking - I can decide if my changes have improved my writing - I can say what tool I used to change the text - I can use 'undo' to remove changes - I can explain the differences between typing and writing - I can make changes to text on a computer - I can say why I prefer typing or writing	- I can describe how music makes me feel, e.g. happy or sad - I can identify simple differences in pieces of music - I can listen with concentration to a range of music (links to the Music curriculum) - I can create a rhythm pattern - I can explain that music is created and played by humans - I can play an instrument following a rhythm pattern - I can identify that music is a sequence of notes - I can refine my musical pattern on a computer - I can use a computer to create a musical pattern using three notes - I can identify that music is a sequence of notes - I can refine my musical pattern on a computer - I can use a computer to create a musical pattern using three notes - I can describe an animal using sounds - I can explain my choices - I can save my work - I can explain how I made my work better - I can listen to music and describe how it makes me feel - I can reopen my work	- I can explain the difference between text and images - I can identify the advantages and disadvantages of using text and images - I can recognise that text and images can communicate messages clearly - I can change font style, size, and colours for a given purpose - I can edit text - I can explain that text can be changed to communicate more clearly - I can create a template for a particular purpose - I can define the term 'page orientation' - I can recognise placeholders and say why they are important - I can choose the best locations for my content - I can make changes to content after I've added it - I can paste text and images to create a magazine cover - I can choose a suitable layout for a given purpose - I can identify different layouts - I can match a layout to a purpose - I can compare work made on desktop publishing to work created by hand - I can identify the uses of desktop publishing in the real world - I can say why desktop publishing might be helpful
Sticky Knowledge	What do we use to enter text into the computer? What key is pressed to turn capital letters on? How can you highlight a word? What does the 'undo' button do?	How can music be made without instruments? How do you save your songs? Name one way to improve a computer based song? How do you find a previously saved piece of work?	What is the difference between text and images? Name one advantage and one disadvantage of adding images to your work. What is page orientation? When might desktop publishing be used in the real world?

Data and Information		
- I can describe objects using labels - I can identify the label for a group of objects - I can match objects to groups - I can count a group of objects - I can count objects - I can group objects - I can describe an object - I can describe a property of an object - I can find objects with similar properties - I can count how many objects share a property - I can group objects in more than one way - I can group similar objects - I can choose how to group objects - I can describe groups of objects - I can record how many objects are in a group - I can compare groups of objects - I can decide how to group objects to answer a question - I can record and share what I have found	- I can compare totals in a tally chart - I can record data in a tally chart - I can represent a tally count as a total - I can enter data onto a computer - I can use a computer to view data in a different format - I can use pictograms to answer simple questions about objects - I can explain what the pictogram shows - I can organise data in a tally chart - I can use a tally chart to create a pictogram - I can answer 'more than'/'less than' and 'most/least' questions about an attribute - I can create a pictogram to arrange objects by an attribute - I can tally objects using a common attribute - I can choose a suitable attribute to compare people - I can collect the data I need - I can create a pictogram and draw conclusions from it - I can give simple examples of why information should not be shared - I can share what I have found out using a computer - I can use a computer program to present information in different ways	- I can create two groups of objects separated by one attribute - I can investigate questions with yes/no answers - I can make up a yes/no question about a collection of objects - I can arrange objects into a tree structure - I can create a group of objects within an existing group - I can select an attribute to separate objects into groups - I can group objects using my own yes/no questions - I can prove my branching database works - I can select objects to arrange in a branching database - I can compare two branching database structures - I can create yes/no questions using given attributes - I can explain that questions need to be ordered carefully to split objects into similarly sized groups - I can create questions and apply them to a tree structure - I can select a theme and choose a variety of objects - I can use my branching database to answer questions - I can compare two ways of presenting information - I can explain what a branching database tells me - I can explain what a pictogram tells me
Sticky Knowledge		
What is a label? How do we group different objects? Why is grouping things important? How could you record your groups?	What is data? How could you present your data? What is a tally used for? How could you use a computer to show your data?	What is data? What is a branching data base? Why is it important to use Yes/No questions in a branching database? What does a branching database do?

Programming - B	- I can compare different programming tools - I can find which commands to move a sprite - I can use commands to move a sprite - I can run my program - I can use a Start block in a program - I can use more than one block by joining them together - I can change the value - I can find blocks that have numbers - I can say what happens when I change a value - I can add blocks to each of my sprites - I can delete a sprite - I can show that a project can include more than one sprite - I can choose appropriate artwork for my project - I can create an algorithm for each sprite - I can decide how each sprite will move - I can add programming blocks based on my algorithm - I can test the programs I have created - I can use sprites that match my design	- I can identify that a program needs to be started - I can identify the start of a sequence - I can show how to run my program - I can change the outcome of a sequence of commands - I can match two sequences with the same outcome - I can predict the outcome of a sequence of commands - I can build the sequences of blocks I need - I can decide which blocks to use to meet the design - I can work out the actions of a sprite in an algorithm - I can choose backgrounds for the design - I can choose characters for the design - I can create a program based on the new design - I can build sequences of blocks to match my design - I can choose the images for my own design - I can create an algorithm - I can compare my project to my design - I can debug my program - I can improve my project by adding features	- I can choose which keys to use for actions and explain my choices - I can explain the relationship between an event and an action - I can identify a way to improve a program - I can choose a character for my project - I can choose a suitable size for a character in a maze - I can program movement - I can choose blocks to set up my program - I can consider the real world when making design choices - I can use a programming extension - I can build more sequences of commands to make my design work - I can choose suitable keys to turn on additional features - I can identify additional features (from a given set of blocks) - I can match a piece of code to an outcome - I can modify a program using a design - I can test a program against a given design - I can evaluate my project - I can implement my design - I can make design choices and justify them
Sticky Knowledge	What do we call a set of commands? What do we need to put at the start of your program? How do you delete a sprite? What is debugging?	What is debugging? How can a program be started? What is an algorithm? How could you improve a project?	Explain why you chose a specific key for an action What is debugging? What is a programming extension? Name two real world things that use programming

Strand	Y4	Y5	Y6

Computing Systems and Networks		
- I can demonstrate how information is shared across the internet - I can describe the internet as a network of networks - I can discuss why a network needs protecting - I can describe networked devices and how they connect - I can explain that the internet is used to provide many services - I can recognise that the World Wide Web contains websites and web pages - I can describe how to access websites on the WWW - I can describe where websites are stored when uploaded to the WWW - I can explain the types of media that can be shared on the WWW - I can explain that internet services can be used to create content online - I can explain what media can be found on websites - I can recognise that I can add content to the WWW - I can explain that there are rules to protect content - I can explain that websites and their content are created by people - I can suggest who owns the content on websites - I can explain that not everything on the World Wide Web is true - I can explain why I need to think carefully before I share or reshare content - I can explain why some information I find online may not be honest, accurate, or legal	- I can describe that a computer system features inputs, processes, and outputs - I can explain that computer systems communicate with other devices - I can explain that systems are built using a number of parts - I can explain the benefits of a given computer system - I can identify tasks that are managed by computer systems - I can identify the human elements of a computer system - I can explain that data is transferred over networks in packets - I can explain that networked digital devices have unique addresses - I can recognise that data is transferred using agreed methods - I can explain that the internet allows different media to be shared - I can recognise that connected digital devices can allow us to access shared files stored online - I can send information over the internet in different ways - I can compare working online with working offline - I can make thoughtful suggestions on my group's work - I can suggest strategies to ensure successful group work - I can explain how the internet enables effective collaboration - I can identify different ways of working together online - I can recognise that working together on the internet can be public or private	- I can compare results from different search engines - I can complete a web search to find specific information - I can refine my search - I can explain why we need tools to find things online - I can recognise the role of web crawlers in creating an index - I can relate a search term to the search engine's index - I can explain that a search engine follows rules to rank relevant pages - I can explain that search results are ordered - I can suggest some of the criteria that a search engine checks to decide on the order of results - I can describe some of the ways that search results can be influenced - I can explain how search engines make money - I can recognise some of the limitations of search engines - I can choose methods of communication to suit particular purposes - I can explain the different ways in which people communicate - I can identify that there are a variety of ways of communicating over the internet - I can compare different methods of communicating on the internet - I can decide when I should and should not share - I can explain that communication on the internet may not be private

Sticky Knowledge	What is the Internet? What does WWW stand for? What is the purpose of the school website? Why is it important to think carefully before sharing content found online?	What is the Internet? What types of media can be shared on the internet? How is working online different to working offline? Why must we be careful what we send online?	What is the Internet? What is a search engine? How are search engine results ordered and why does it matter? Why may communication on the internet not be private?
Creating Media	- I can identify digital devices that can record sound and play it back - I can identify the inputs and outputs required to play audio or record sound - I can recognise the range of sounds that can be recorded - I can discuss what other people include when recording sound for a podcast - I can suggest how to improve my recording - I can use a device to record audio and play back sound - I can discuss why it is useful to be able to save digital recordings - I can plan and write the content for a podcast - I can save a digital recording as a file - I can discuss ways in which audio recordings can be altered - I can edit sections of of an audio recording - I can open a digital recording from a file - I can choose suitable sounds to include in a podcast - I can discuss sounds that other people combine - I can use editing tools to arrange sections of audio - I can discuss the features of a digital recording I like - I can explain that digital recordings need to be exported to share them - I can suggest improvements to a digital recording	- I can compare features in different videos - I can explain that video is a visual media format - I can identify features of videos - I can experiment with different camera angles - I can identify and find features on a digital video recording device - I can make use of a microphone - I can capture video using a range of filming techniques - I can review how effective my video is - I can suggest filming techniques for a given purpose - I can create and save video content - I can decide which filming techniques I will use - I can outline the scenes of my video - I can explain how to improve a video by reshooting and editing - I can select the correct tools to make edits to my video - I can store, retrieve, and export my recording to a computer - I can evaluate my video and share my opinions - I can make edits to my video and improve the final outcome - I can recognise that my choices when making a video will impact on the quality of the final outcome	- I can discuss the different types of media used on websites - I can explore a website - I know that websites are written in HTML - I can draw a web page layout that suits my purpose - I can recognise the common features of a web page - I can suggest media to include on my page - I can describe what is meant by the term 'fair use' - I can find copyright-free images - I can say why I should use copyright-free images - I can add content to my own web page - I can evaluate what my web page looks like on different devices and suggest/make edits - I can preview what my web page looks like - I can describe why navigation paths are useful - I can explain what a navigation path is - I can make multiple web pages and link them using hyperlinks - I can create hyperlinks to link to other people's work - I can evaluate the user experience of a website - I can explain the implication of linking to content owned by others

Sticky Knowledge	Name devices that can record and playback sound. What is a podcast? How could an audio file be altered? What does exporting mean?	Name three different shot set ups What tools could you use to edit a video? How is a YouTube face-cam react video different to a vlog? Name three types of Video-On-Demand	What is HTML? What is a hyperlink? Name an implication of linking content owned by others.
Programming - A	- I can create a code snippet for a given purpose - I can explain the effect of changing a value of a command - I can program a computer by typing commands - I can test my algorithm in a text-based language - I can use a template to create a design for my program - I can write an algorithm to produce a given outcome - I can identify everyday tasks that include repetition as part of a sequence, eg brushing teeth, dance moves - I can identify patterns in a sequence - I can use a count-controlled loop to produce a given outcome - I can choose which values to change in a loop - I can identify the effect of changing the number of times a task is repeated - I can predict the outcome of a program containing a count-controlled loop - I can explain that a computer can repeatedly call a procedure - I can identify 'chunks' of actions in the real world - I can use a procedure in a program - I can design a program that includes count-controlled loops - I can develop my program by debugging it - I can make use of my design to write a program	- I can create a simple circuit and connect it to a microcontroller - I can explain what an infinite loop does - I can program a microcontroller to make an LED switch on - I can connect more than one output component to a microcontroller - I can design sequences that use count-controlled loops - I can use a count-controlled loop to control outputs - I can design a conditional loop - I can explain that a condition is either true or - I can program a microcontroller to respond to an input - I can explain that a condition being met can start an action - I can identify a condition and an action in my project - I can use selection (an 'if…then…' statement) to direct the flow of a program - I can create a detailed drawing of my project - I can describe what my project will do - I can identify a real-world example of a condition starting an action - I can test and debug my project - I can use selection to produce an intended outcome - I can write an algorithm that describes what my model will do	- I can explain that the way that a variable changes can be defined - I can identify examples of information that is variable - I can identify that variables can hold numbers or letters - I can explain that a variable has a name and a value - I can identify a program variable as a placeholder in memory for a single value - I can recognise that the value of a variable can be changed - I can decide where in a program to change a variable - I can make use of an event in a program to set a variable - I can recognise that the value of a variable can be used by a program - I can choose the artwork for my project - I can create algorithms for my project - I can explain my design choices - I can choose a name that identifies the role of a variable - I can create the artwork for my project - I can test the code that I have written - I can extend my game further using more variables - I can identify ways that my game could be improved - I can share my game with others

Sticky Knowledge	What is debugging? What is a loop? How does changing the number affect the program? What is the benefit of a procedure?	What is the difference between a loop and a conditional loop? What would an 'if…then…' do to a statement? Can you identify a real world example of a condition starting an action?	What role do variables play? What is debugging? Why does art choice matter in games? Name one thing an event can do
Data and Information	- I can choose a data set to answer a given question - I can identify data that can be gathered over time - I can suggest questions that can be answered using a given data set - I can explain that sensors are input devices - I can identify that data from sensors can be recorded - I can use data from a sensor to answer a given question - I can identify a suitable place to collect data - I can identify the intervals used to collect data - I can talk about the data that I have captured - I can import a data set - I can use a computer program to sort data - I can use a computer to view data in different ways - I can plan how to collect data using a data logger - I can propose a question that can be answered using logged data - I can use a data logger to collect data - I can draw conclusions from the data that I have collected - I can explain the benefits of using a data logger - I can interpret data that has been collected using a data logger	- I can create multiple questions about the same field - I can explain how information can be recorded - I can order, sort, and group my data cards - I can choose which field to sort data by to answer a given question - I can explain what a 'field' and a 'record' is in a database - I can navigate a flat-file database to compare different views of information - I can combine grouping and sorting to answer more specific questions - I can explain how information can be grouped - I can group information to answer questions - I can choose multiple criteria to answer a given question - I can choose which field and value are required to answer a given question - I can outline how 'AND' and 'OR' can be used to refine data selection - I can explain the benefits of using a computer to create graphs - I can refine a chart by selecting a particular filter - I can select an appropriate chart to visually compare data - I can ask questions that will need more than one field to answer - I can present my findings to a group - I can refine a search in a real-world context	- I can answer questions from an existing data set - I can ask simple relevant questions which can be answered using data - I can explain the relevance of data headings - I can apply an appropriate number format to a cell - I can build a data set in a spreadsheet application - I can explain what an item of data is - I can construct a formula in a spreadsheet - I can explain the relevance of a cell's data type - I can identify that changing inputs changes outputs - I can apply a formula to multiple cells by duplicating it - I can create a formula which includes a range of cells - I can recognise that data can be calculated using different operations - I can apply a formula to calculate the data I need to answer questions - I can explain why data should be organised - I can use a spreadsheet to answer questions - I can produce a graph - I can suggest when to use a table or graph - I can use a graph to show the answer to questions

Sticky Knowledge	What is data? How can data be sorted? What does a data logger do? What is important to do with data?	What is data? What is a record? How do computers sort information? What would an 'And' command do when searching for data?	What is data? What is a cell? What is a formula? How could you show the answer to a question?
Creating Media	- I can explain the effect that editing can have on an image - I can explore how images can be changed in real life - I can identify changes that we can make to an image - I can change the composition of an image by selecting parts of it - I can consider why someone might want to change the composition of an image - I can explain what has changed in an edited image - I can choose effects to make my image fit a scenario - I can explain why my choices fit a scenario - I can talk about changes made to images - I can choose appropriate tools to retouch an image - I can give examples of positive and negative effects that retouching can have on an image - I can identify how an image has been retouched - I can combine parts of images to create new images - I can sort images into 'fake' or 'real' and explain my choices - I can talk about fake images around me - I can compare the original image with my completed publication - I can consider the effect of adding other elements to my work - I can evaluate the impact of my publication on others through feedback	- I can discuss how a vector drawing is different from paper-based drawings - I can identify the main drawing tools - I can recognise that vector drawings are made using shapes - I can explain that each element added to a vector drawing is an object - I can identify the shapes used to make a vector drawing - I can move, resize, and rotate objects I have duplicated - I can explain how alignment grids and resize handles can be used to improve consistency - I can modify objects to create different effects - I can use the zoom tool to help me add detail to my drawings - I can change the order of layers in a vector drawing - I can identify that each added object creates a new layer in the drawing - I can identify which objects are in the front layer or in the back layer of a drawing - I can copy part of a drawing by duplicating several objects - I can group to create a single object - I can reuse a group of objects to further develop my vector drawing - I can apply what I have learned about vector drawings - I can suggest improvements to a vector drawing - I create alternatives to vector drawings	- I can discuss the similarities and differences between 2D and 3D shapes - I can explain why we might represent 3D objects on a computer - I can select, move, and delete a digital 3D shape - I can change the colour of a 3D object - I can identify how graphical objects can be modified - I can resize a 3D object - I can position 3D objects in relation to each other - I can rotate a 3D object - I can select and duplicate multiple 3D objects - I can create digital 3D objects of an appropriate size - I can group a digital 3D shape and a placeholder to create a hole in an object - I can identify the 3D shapes needed to create a model of a real-world object - I can choose which 3D objects I need to construct my model - I can modify multiple 3D objects - I can plan my 3D model - I can decide how my model can be improved - I can evaluate my model against a given criterion - I can modify my model to improve it

Sticky Knowledge	Why should we be careful when looking at images online? What does retouching/airbrushing mean? How could an image be 'fake'? How are real and fake images different?	What is vector drawings? What techniques can you use to change the shapes? How can you easily copy several objects? How is vector drawing different to other digital drawing?	What is duplicating? Why would objects be represented in 3D? What would happen to a 3D object if it was rotated? How could a 3D model be created?
Programming - B	- I can list an everyday task as a set of instructions including repetition - I can modify a snippet of code to create a given outcome - I can predict the outcome of a snippet of code - I can choose when to use a count-controlled and an infinite loop - I can modify loops to produce a given outcome - I can recognise that some programming languages enable more than one process to be run at once - I can choose which action will be repeated for each object - I can evaluate the effectiveness of the repeated sequences used in my program - I can explain what the outcome of the repeated action should be - I can explain the effect of my changes - I can identify which parts of a loop can be changed - I can re-use existing code snippets on new sprites - I can develop my own design explaining what my project will do - I can evaluate the use of repetition in a project - I can select key parts of a given project to use in my own design - I can build a program that follows my design - I can evaluate the steps I followed when building my project - I can refine the algorithm in my design	- I can identify conditions in a program - I can modify a condition in a program - I can recall how conditions are used in selection - I can create a program with different outcomes using selection - I can identify the condition and outcomes in an 'if... then… else...' statement - I can use selection in an infinite loop to check a condition - I can design the flow of a program which contains 'if… then… else…' - I can explain that program flow can branch according to a condition - I can show that a condition can direct program flow in one of two ways - I can identify the outcome of user input in an algorithm - I can outline a given task - I can use a design format to outline my project - I can implement my algorithm to create the first section of my program - I can share my program with others - I can test my program - I can extend my program further - I can identify the setup code I need in my program - I can identify ways the program could be improved	- I can apply my knowledge of programming to a new environment - I can test my program on an emulator - I can transfer my program to a controllable device - I can determine the flow of a program using selection - I can identify examples of conditions in the real world - I can use a variable in an if, then, else statement to select the flow of a program - I can experiment with different physical inputs - I can explain that if you read a variable, the value remains - I can use a condition to change a variable - I can explain the importance of the order of conditions in else, if statements - I can modify a program to achieve a different outcome - I can use an operand (e.g. <>=) in an if, then statement - I can decide what variables to include in a project - I can design the algorithm for my project - I can design the program flow for my project - I can create a program based on my design - I can test my program against my design - I can use a range of approaches to find and fix bugs
Sticky Knowledge	What is debugging? What is coding? What is an example of a programming language? Why would a programmer re-use existing code snippets?	What is debugging? Why do engineers test their code? What is the use of an 'if' condition? What is an infinite loop and how is it used?	What is debugging? What are real world examples of programming? How would ' if <' statement work? Why is it important to always test code?