Reach for the Stars

Progression in the Computing Curriculum

Computer Science

E-Safety

Creativity

Learning to be computer scientists

Computer Science Unit Overviews

Key Stage 1		Key Stage 2			
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Which way to go? Demonstrate logical thinking to support algorithmic thinking, prediction and debugging. Encode algorithms to a program to control a floor turtle. Activity types are unplugged and physical computing. Use logical thinking to evaluate algorithms and route-based programs to improve outcomes.	**Testing Testing** Sequences are the main logical structure of algorithms or programs. Children will predict and investigate route-based programs to answer numerous challenges. Some of the tasks will require the children to modify route-based programs and make their own route-based programs.	**Can you repeat that please?** This unit will look at debugging sequences of code. Use j2Code tool 'Visual' to create a scene with two characters having a conversation/telling a joke. Complete some 'unplugged activities' to improve concepts of debugging, logical reasoning. Use j2Code tool 'Visual'. Create the code in Visual to draw simple shapes and patterns. Introduce pupils to repetition in code.	**On the Move!** This unit will use Scratch 3. Pupils will use various inputs and output to make this move, change size or play sounds. They will also learn how to use 'broadcast' as a conditional input. Using Scratch 3 to introduce movement blocks to animate sprites, changing backgrounds and using conditional statements If.. Then.. Reinforcing sequence, repetition and selection in programming.	**Making games** Develop logical thinking and coding using Scratch 3 to make a range of computer games.	**Game design** Using Scratch 3 to effectively plan, design and build complex code that uses pseudocode, cloning and conditional operators (Boolean).

Computer Science Pupil Outcomes

Key Stage 1		Key Stage 2			
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Which way to go? I can explain what an algorithm is I understand that instructions need to be written clearly and in the correct order to complete a specific task I can use logical reasoning to create an algorithm to complete a specific task I can debug a simple algorithm I can reorder instructions to complete a specific task I can follow instructions I understand what a program is and how it is different to an algorithm	**Testing Testing** I can give a sequence of commands to complete a specific task I can follow a sequence of commands to complete a specific task I can predict the movement of the sprite to create a route-based program before I test it out I can debug my route-based program during running the program to correct any mistakes I can evaluate my algorithms to make judgements on its effectiveness before I create a route-based program to complete a given task	**Can you repeat that please?** I can use symbols to write an algorithm. I can debug a simple algorithm. I can create and write a simple algorithm. I can change sprites and backgrounds I can create a sequence of code in blocks in Visual I can identify errors in blocks of code I can modify a sequence of code blocks to fix errors I can select my own Background and Sprites to create a simple algorithm that tells a	**On the Move!** I can write code using a sequence I can use the drawing tools to edit sprite costumes I can debug a simple algorithm. I can change the background of my scene and add my choice of sprites in scratch. I can add the music extensions blocks to scratch I can write an algorithm that contains a forever loop to repeat a sequence I can modify a sequence of code blocks to fix errors	**Making games** I can use selection if then can be used to make something happen e.g. if touching another sprite then…do something I know the term input – and understand that they can trigger an event, e.g. when the green flag is clicked then… I know that sprites can be controlled by different inputs I can use abstraction to identify what details I need to include in a game I can compare code and explain why one is better than the other	**Game design** I can increase the speed of a car based on a condition being met I can write a programming plan using pseudo code I can create several variables and use them correctly I can use conditional if/else blocks I can create a game that has multiple questions in a loop I know what Boolean Logic is and that computer science relies on True/False conditions being met I can explain what makes a good game.

I can use logical thinking to predict the behaviour of simple route-based programs to control a beebot/on-screen turtle I can write simple route-based programs to control a beebot/on-screen turtle I can debug a simple route-based program to control a beebot/ on-screen turtle I know that there is more than one way to solve a problem, but some are more efficient than others I can use logical thinking to evaluate my algorithm and route-based program to improve the outcome	I can use logical thinking to reverse a route-based program	short story / scene with characters interacting. I can add an input to my code e.g. – when a key is pressed. I can predict the outcome of a simple algorithm. I can write a program that creates simple shapes and repeated shapes. I can add a repeat loop into my written algorithm I can debug my program. I can use a nested loop and explain why I have used it.	I can use Broadcast messages as inputs to trigger events I can select my own Background and Sprites to create a simple algorithm that tells a short story / scene with characters interacting. I understand what an input is I understand that the stage area is split into quadrants and can use the x and y axis values to move a sprite around I can move a sprite using various inputs (arrow keys, code, mouse) I can change the look of a sprite, through code, to switch between costumes I understand how and when to use the wait command in coding	I understand that code must be precise and that some scripts are more effective than others. I can code a sprite to hide and show again in a random position. I can create a range of variables e.g. for keeping score/time I understand the difference between the x and y axis and effectively use this knowledge to create a falling sprite. I can write a script for a sprite to start at the top of the stage in a random position I can 'hide' a sprite and send it back to the top of the screen if touching another sprite I can use the ask block and know that this will require an input from the keyboard	I can identify the components of a game. I know how a game is made.

			I understand the need for a continuous loop in programming I can create algorithms that are logical and in the correct order, giving precise instructions for each part of my maze program I can use if then code blocks and continuous loops in my program I can compare block-based code to an algorithm and identify where changes need to be made in the code to match the algorithm	I can create and use a procedure block I can use other scratch examples to help plan my own maze game, carefully evaluating other people's code to help me I am able to use variables in nested loops I can reflect on a scratch game and say how to improve it further	

Learning to be Creators

Data Handling Unit Overviews

Key Stage 1		Key Stage 2		
Year 1	**Year 2**	**Year 3**	**Year 5**	**Year 6**
Collecting data Create charts using JIT 'Chart' and 'Pictogram' tools. Develop an understanding of interpreting data from a chart using JIT 'Mix' to present work	**Organising data** Develop a better understanding of interpreting data from a chart – using JIT 'Chart' and 'Pictogram' tools. Gather opinions using the j2vote software and present the findings.	**Branching Out** Understand what a database is and how frequently we use them in life. Use JiT Branch to create and use a branching database, focusing on questions to ask to uniquely identify objects/people. Use j2Data to interrogate a simple database. Create a j2e5 file to evidence screen captures of the searches and to reflect on learning.	**How useful is a spreadsheet?** Use and create spreadsheets to support solving mathematical problems, use simple formulae to carry out calculations and answering what if type questions. Present information in the form of graphs where required.	**Spreadsheet modelling** Create spreadsheets that are fit for purpose and support the user in finding the answers to problems by modelling real life situations. Consider layout options to improve the user experience and create complex formula, that uses brackets, to carry out two step calculations.

Data Handling Pupil Outcomes

Key Stage 1		Key Stage 2		
Year 1	**Year 2**	**Year 3**	**Year 5**	**Year 6**
Collecting data I can create a tally chart I can analyse data from a tally chart I can add data to a pictogram using data from a tally chart I can analyse data from a pictogram I can add data to a bar chart using data from a pictogram I understand about the x and y axis and how this relates to my data I can analyse data from a simple bar chart	**Organising data** I can create questions with appropriate multiple-choice answers I can interpret data from a chart I can design a data collection sheet I can use a branching database to sort and organise data	**Branching Out** I can create a branching database I can use a branching database to classify data I can use a simple database to search and sort information I understand what field and record mean in a database I can enter data into a class database I can recognise different types of data I can explain the difference between discrete and continuous data I can create charts to interpret data I can find errors in a database	**How useful is a spreadsheet?** I know what a cell reference/cell address is I know how to generate lists of numbers using the autofill tool I can create simple formulae to perform calculations in a spreadsheet I can make my formulae more efficient through using the inbuilt formulae functions and cell references I can use column labels appropriately in a spreadsheet I can explain how formulae work in a spreadsheet I can use a spreadsheet to help solve problems I can use the editing tools to improve the legibility of a spreadsheet table and display decimal places	**Spreadsheet modelling** I can create simple formulae to perform calculations in a spreadsheet I can create formulae to find the min and max scores in a game I understand the importance of expressing formulae correctly I can create formulae to carry out each one of the four basic mathematical functions I understand which variables to change and can predict what the effect of changing the variable will be to answer 'what if?' questions I can use the editing tools to improve the legibility of a spreadsheet table and display decimal places

		I understand that there is a difference between a computer and paper-based database	I can present and interpret information in a graph	I can design and create a functional spreadsheet that includes working formulae, to answer a real-life problem I can abstract information fit for purpose and use it in a spreadsheet to model answers to the problems

Creators Unit Overviews

Key Stage 1		Key Stage 2		
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Word Skills Develop understanding of Word and the tools they can use to create a simple word document linked to cross-curricular learning	**Text and graphics together** **Stop Motion 2D** Use Publisher to create an information poster linked to cross-curricular learning Design animations that present information on a topic. Each lesson assets will be drawn using JIT5 'Paint' as well as adding backgrounds and shared images to combine and create an effective animation	**QR Codes** Explore what QR codes are and how they are created to present information to a user. Children will record sound files and create QR codes to allow others to access and listen to the sound file	**Its all in the presentation** **Green Screening** Develop an understanding of the features and tools of PowerPoint. Create their own presentation to present information to an audience on cross-curricular learning. Create an understanding of how green screening is used in the film industry and then create a short green screen film of their own linked to cross-curricular learning.	**Infographics** Develop an understanding of what makes infographics a popular choice to present and share information. Develop an understanding of colour, styling, enhanced editing tools and the use of charts/graphs/tables to effectively present information. They will research and select key information to present as an infographic in J2e5

Creators Pupil Outcomes

Key Stage 1		Key Stage 2		
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Word Skills I can input text I can edit text I can copy and paste images I can change the colour and style of fonts I can save my work in my files I can print my work	**Text and graphics together** I can insert a text box I can edit text I can copy and paste images I can edit images I can change the colour and style of fonts I can save my work in my files I can print my work **Stop Motion 2D** I can name and save my work as a JiT Paint file, an image and a stamp. I know what a frame is - an individual pictures in a sequence and that an animation creates an illusion of movement when frames are shown in sequence	**QR Codes** I know what a QR code is I know that a QR code stores data that is machine readable that directs a user to the information I know how to create a QR code online I can scan a QR code and access the information that it links to I can search for appropriate images using Google I can save an image from Google and upload to to J2e I can add text boxes, shapes and images to a J2e5 file I can use layers in J2e5 I can record sound in J2e5	**It's all in the presentation** I can choose an appropriate design for my presentation I can edit slide layouts I can include appropriate information I can choose appropriate fonts I can add transitions between slides I can add animations when needed I can present my information **Green Screening** I can create a story board I can record frames I can edit frames to create a short film I can add titles and credits	**Infographics** I can explain what an infographic is and why infographics are used by businesses I know that infographics are easy to find in a web search because of the way the search engine algorithm works e.g. favouring content shared on social media I can make judgements on the design of an infographic to evaluate its effectiveness I understand that colour can impact the design of an infographic due to meanings and associations as well as colour combinations I know that text styles are chosen for their effect and intended use when presenting information I know that carefully selecting images to convey the right message is important

	I can create several paintings and save them as pictures to use later. I can use the textures and colour wheel to add extra detail to my pictures I can make use of the 'onion skin' effect to add movement to my JiT animation. I know the difference between the duplicate + frame and + add frame when using JiT animate. I can add background images and stamps to my presentation. I can create a JiT Paint file and add text to it.	I can create a QR code that links to my sound recording in J2e I can add a QR code to my J2e5 file and print it	I can evaluate my film	I understand that I should abide by copyright licences if I am to use someone else's image in my own work I understand how to carry out an image search more effectively by using the appropriate search tools I can use charts and graphs appropriately to display data I have considered the overall design and limited my use of colour and images so as not to distract from the intention of the infographic I have used a variety of presentation skills such as layering, transparent images, coloured text, filled text boxes and background fills to design my infographic I have carefully chosen interesting and related facts and stats to convey the intended message for my infographic

Learning to be e-safe

E-Safe Unit Overviews

Key Stage 1		Key Stage 2			
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Safe Online Learn what we mean by being online and that we can leave a digital footprint when using the internet. Think about and discuss different ways for staying safe when using the internet. **What is Cyberbullying?** Understand what we mean by cyberbullying and that some people can use the internet to bully others. Discuss and consider how this makes us feel and understand where we can go for help or what we should do.	**The Secret Code** Understand what a password is. Learn why passwords are important and the reasons for keeping them private. Look at what makes a strong password. **Online Community** Learn that computers can be used to communicate with people close and far away creating an online community. Discuss and consider our responsibilities when using the online community.	**Sticks and Stones** Learn about how what we say and write can sometimes be hurtful to others. Understand where we can go for help and support if we have any concerns. **Good Digital Citizen** Understand that we have responsibilities as an online citizen. Learn how we can use technology safely and respectfully in order to be a good digital citizen	**Keeping it Private** Recap on how passwords can keep personal information safe. Learn how we can protect ourselves online by thinking about the information we share with others. **Whose is it anyway?** Understand the term plagiarism. Consider why this is important. Think about how we can find out information and change this into our own work so that we show respect for other people's work.	**Who can you talk to?** Understand that cyberbullying can have many different forms. Discuss strategies for dealing with online issues and identify where we can go for help and support if we need it. **Privacy Rules** Learn that we must keep our personal information private when online and what the consequences can be. Learn about how we can protect ourselves using privacy settings.	**Digital Life** Learn about digital media and the benefits it has. Understand our responsibilities when using digital media. **Scams and Schemes** Learn how others might access our private information online through the use of scams and schemes. Consider how we can prevent this happening to us. Identify where to go for help and support if we need it.

E-Safe Pupil Outcomes

Key Stage 1		Key Stage 2			
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Safe Online I know what online means I know different ways to keep safe online I know different ways information and data are shared online **What is Cyberbullying?** I understand what cyberbullying is I know how some people use the internet to bully others I know how cyberbullying can make us feel I know where I can go for help if I feel unsafe or unsure	**The Secret Code** I understand what a password is I know why passwords are important I understand why we should keep passwords private I know where and how to report concerns online I know that keeping secrets is not right if they relate to being safe **Online Community** I know that computers can be used to communicate with people close and far away I can name some of the different ways computers help us communicate	**Sticks and Stones** I understand that we must use technology safely and respectfully I understand that the words we write can be hurtful I know where to go for help and support when I have concerns I understand how negative use of the internet can make us feel I understand that cyberbullying has a negative and sometimes a lasting impact on us **Good Digital Citizen** I know what my responsibilities are online I know how to respond safely online	**Keeping it Private** I understand the importance of using passwords I understand why we need to keep our passwords safe I know how I can protect myself online I understand which information I shouldn't share with others I know where and how to report concerns with issues online I know that keeping secrets is not always right if they are about being safe **Whose is it anyway?** I understand what plagiarism means	**Who can you talk to?** I understand the difference between cyberbullying and in person bullying I know of strategies I can use to deal with bullying I can identify where I can go for help and support if I need it **Privacy Rules** I understand the concept of privacy I understand the importance of keeping personal information private online I understand about privacy settings I know that keeping secrets is not always right if they are about being safe	**Digital Life** I understand what digital media is I understand the benefits of digital media I know the benefits of rationing time spent online as well as the risks of excessive use I understand my responsibilities when using digital media **Scams and Schemes** I understand how others might access my private information I understand why they might want my private information

	I understand that we must use technology safely and respectfully I know that sometimes people behave differently online	I know where and how to report concerns with issues online To consider the effects of their online actions on others	I understand how we can show respect for other people's work I know why social media, computer games and online gaming are age restricted	I understand the effect my online actions have on others	I can identify where to go for help and support if I need it I understand the effect my online actions have on others I understand how information and data is shared and used