

Computing Content Spine

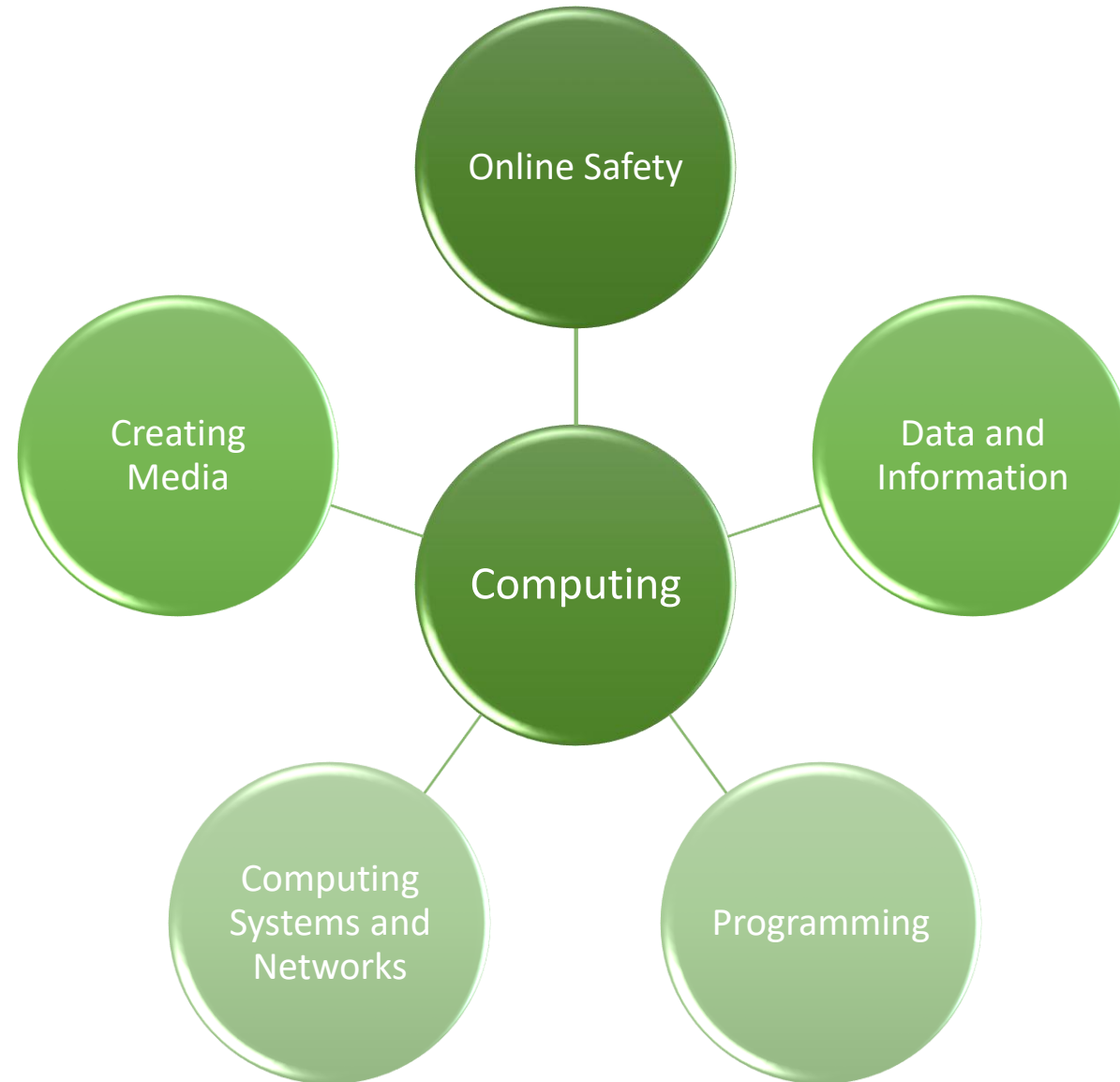
	Autumn		Spring		Summer	
	Computing systems and networks	Creating media	Programming A	Data and information	Creating media	Programming B
Year 3	<p>Connecting computers</p> <p>Children will learn:</p> <ul style="list-style-type: none"> That digital devices have inputs, processes and outputs How devices can be connected to make networks 	<p>Stop-frame animation</p> <p>Children will learn:</p> <ul style="list-style-type: none"> How to capture and edit digital still images How to produce a stop-frame animation that tells a story 	<p>Sequencing sounds</p> <p>Children will learn:</p> <ul style="list-style-type: none"> How to create sequences in a block-based programming language to make music 	<p>Branching databases</p> <p>Children will learn:</p> <ul style="list-style-type: none"> How to build and use branching databases to group objects using yes and no questions 	<p>Desktop publishing</p> <p>Children will learn:</p> <ul style="list-style-type: none"> How to create documents by modifying text, images and page layouts for a specified purpose 	<p>Events and actions in programs</p> <p>Children will learn:</p> <ul style="list-style-type: none"> How to write algorithms and programs that use events to trigger sequences of actions
Year 4	<p>The internet</p> <p>Children will learn:</p> <ul style="list-style-type: none"> That the internet is a network of networks including the WWW Why we should evaluate online content 	<p>Audio production</p> <p>Children will learn:</p> <ul style="list-style-type: none"> How to capture and edit audio How to use their audio to produce a podcast The importance of copyright and how to consider this 	<p>Repetition in shapes</p> <p>Children will learn:</p> <ul style="list-style-type: none"> How to use a text-based programming language to draw shapes using count-controlled loops 	<p>Data logging</p> <p>Children will learn:</p> <ul style="list-style-type: none"> How and why data is collected over time How to use data loggers to carry out an investigation 	<p>Photo editing</p> <p>Children will learn:</p> <ul style="list-style-type: none"> How to manipulate digital images Reflect on the impact of these changes and whether they have fulfilled the required brief 	<p>Repetition in games</p> <p>Children will learn:</p> <ul style="list-style-type: none"> Use a block-based programming language to create a game using count-controlled and infinite loops

Computing Content Spine

	Autumn		Spring		Summer	
	Computing systems and networks	Creating media	Programming A	Data and information	Creating media	Programming B
Year 5	<p>Systems and searching</p> <p>Children will learn:</p> <ul style="list-style-type: none"> To recognise IT systems in the world and how some can enable searching on the internet 	<p>Video production</p> <p>Children will learn:</p> <ul style="list-style-type: none"> How to plan, capture and edit video to produce a short film 	<p>Selection in physical computing</p> <p>Children will learn:</p> <ul style="list-style-type: none"> How to explore conditions and selection using a programmable microcontroller 	<p>Flat-file databases</p> <p>Children will learn:</p> <ul style="list-style-type: none"> How to use a database How to create charts to answer questions 	<p>Introduction to vector graphics</p> <p>Children will learn:</p> <ul style="list-style-type: none"> How to create images in a drawing program How to use layers and groups of objects 	<p>Selection in quizzes</p> <p>Children will learn:</p> <ul style="list-style-type: none"> How to explore selection in programming to design and code an interactive quiz
Year 6	<p>Communication and collaboration</p> <p>Children will learn:</p> <ul style="list-style-type: none"> How data is transferred in packets How best to work collaboratively online for given purposes 	<p>Webpage creation</p> <p>Children will learn:</p> <ul style="list-style-type: none"> How to design and create a webpage How to consider copyright, aesthetics and ease of navigation for users 	<p>Variables in games</p> <p>Children will learn:</p> <ul style="list-style-type: none"> How to select and change variables when designing and coding a game 	<p>Introduction to spreadsheets</p> <p>Children will learn:</p> <ul style="list-style-type: none"> How to use a spreadsheet to input and sort data How to answer questions by organising and calculating data 	<p>3D modelling</p> <p>Children will learn:</p> <ul style="list-style-type: none"> How to plan and develop 3D computer models of physical objects on the workplane How to evaluate their models in terms of size, scale and 3D printability 	<p>Sensing movement</p> <p>Children will learn:</p> <ul style="list-style-type: none"> <input type="checkbox"/> How to capture inputs from a physical device <input type="checkbox"/> How to design and code a project which allows this to happen

Computing

Key Concepts



Computing Progression Map – Online Safety

Year 3

Self Image and Identity

- Explain how I represent myself in different ways online
- Demonstrate reasonable choices about my online identity, depending on context.
- Describe issues online that might make me and others feel sad, worried, uncomfortable or frightened.
- Know and give examples of how I can get help both on and offline.
- Explain why I should keep asking until I get the help I need.

Online Relationships

- Describe ways people who have similar likes and interests can get together online.
- Give examples of technology-specific forms of communication eg. emojis and acronyms.
- Explain some risks of communications online with others I don't know well.

Online Reputation

- Recognise the need to be careful before sharing anything about myself or others online.
- Know who to ask if I am not sure if something should be put online.
- Describe ways that information about people online can be used by others to make judgements about an individual.
- Understand that anything I put online is part of my 'digital footprint' and lasts infinitely.

Online Bullying

- Explain what bullying is and describe how people may bully others.
- Describe rules about how to behave online and how to follow them.
- Identify some online technologies where bullying might take place.



Computing Progression Map – Online Safety

Year 3 continued

Online Information

- Use key phrases in search engines.
- Explain how the internet can be used to buy and sell things.
- Describe how to search for information within a wide group of technologies such as social media, image sites and video sites.
- Describe some of the methods used to encourage people to buy things online and recognise them when they appear online.
- Explain what autocomplete is and how to choose the best suggestion.

Health, Wellbeing and Lifestyle

- Explain why spending too much time using technology can sometimes have a negative impact; give examples of activities where it is easy to spend a lot of time engaged eg. games, films, video sites.
- Explain how using technology can distract from other things that might or should be done.

Privacy and Security

- Give reasons why I should only share information with people I choose to and can trust.
- Understand and give reasons why passwords are important.
- Describe simple strategies for creating and keeping passwords private.
- Explain what a strong password is.

Copyright and Ownership

- Explain that copying someone else's work from the internet without permission can cause problems.
- Give examples of what these problems might be.

Computing Progression Map – Online Safety

Year 4

Self Image and Identity

- Explain what is meant by the term 'identity'.
- Explain how and why an identity might be changed depending on what is happening online eg. gaming, using an avatar, social media.

Online Relationships

- Explain how I should be careful who I trust online and which information to trust them with.
- Explain how feelings can be hurt by what is written online.
- Explain why I might take back my trust in someone or something if it makes me feel nervous, uncomfortable or worried.
- Demonstrate how I would support others (including if they are having difficulties) online.
- Demonstrate ways of reporting problems for both myself and my friends.

Online Reputation

- Describe how others can find information about me by looking online.
- Explain ways that some of the information about me online could have been created, copied or shared by others.

Online Bullying

- Describe ways people can be bullied through a range of technologies.
- Explain why it is important to think carefully about how content posted online might affect others, their feelings and how others feel about them.
- Recognise when someone is upset, hurt or angry online.

Computing Progression Map – Online Safety

Year 4 continued

Online Information

- Explain that some people met online may be computer programs pretending to be real people.
- Explain the difference between a belief, an opinion and a fact.
- Analyse information and differentiate between beliefs, opinions and facts.
- Explain why lots of people sharing the same beliefs or opinions does not make them facts.
- Use different search technologies.
- Evaluate digital content and explain how to make choices from search results.
- Explain key concepts including data, information, true, false, valid, reliable and evidence.

Health, Wellbeing and Lifestyle

- Identify times or situations when it would be good to limit the amount of time spent using technology.
- Suggest strategies to help limit this time.
- Describe ways technology can affect healthy sleep and describe some of the issues.

Privacy and Security

- Describe strategies for keeping personal information private, depending on context.
- Explain that others online can pretend to be me or other people, including my friends.
- Suggest reasons why they might do this.
- Explain how internet use can be monitored.

Copyright and Ownership

- When searching on the internet for content to use, explain why I need to consider who owns it and whether I have the right to reuse it.
- Assess and justify when it is acceptable to use the work of others.



Computing Progression Map – Online Safety

Year 5

Self Image and Identity

- Explain how my online identity can be different to the identity I present in real life.
- Describe how to make the right decisions about how to interact with others.
- Explain how identity online can be copied, modified or altered.

Online Relationships

- Explain what it means to 'know someone' online and why this might be different to knowing someone in real life.
- Explain that 'trusting someone' online is different from 'liking someone' online.
- Describe strategies for safe and fun experiences in a range of online environments.
- Explain that there are some people online who may want to do me or my friends harm and that this is not my/my friends' fault.

Online Reputation

- Search for information about an individual online and create a summary report of the information found.
- Describe ways that information about people online can be used by others to make judgements about an individual.

Online Bullying

- Recognise when someone is upset, hurt or angry online.
- Describe how to get help for someone who is being bullied online and assess when to do/say something or tell a trusted adult.
- Explain how to block abusive users.
- Explain how to report online bullying in apps and platforms used.
- Describe the helpline services who can support and what to say or do if help is required.

Computing Progression Map – Online Safety

Year 5 continued

Online Information

- Understand the difference between online misinformation (inaccurate information distributed by accident) and disinformation (inaccurate information deliberately distributed and intended to mislead).
- Explain what is meant by being 'skeptical' and give examples.
- Explain what is meant by 'hoax' and why it is important to think carefully before forwarding anything online.
- Explain why some information online might not be honest, accurate or legal.
- Explain why information that is on a large number of sites may still be inaccurate or untrue.
- Use search technologies effectively.

Health, Wellbeing and Lifestyle

- Describe some strategies, tips or advice to promote healthy sleep with regards to technology.
- Describe common systems that regulate age-related content (PEGI, BBFC, parental warnings) and describe their purpose.

Privacy and Security

- Create and use strong and secure passwords.
- Describe effective strategies for managing those passwords.
- Explain how many free apps or services may read and share personal information (friends, contacts, likes, images, video, messages, location) with others.
- Explain why it is important to seek permission from a trusted adult before purchasing online.
- Use different passwords for a range of online services.
- Know what to do if a password is lost or stolen.

Copyright and Ownership

- Give examples of content that is permitted to be reused.
- Demonstrate the use of search tools to find and access online content which can be reused by others.

Computing Progression Map – Online Safety

Year 6

Self Image and Identity

- Describe ways in which media can shape ideas about gender.
- Identify messages about gender roles and make judgements based on them.
- Challenge and explain why it is important to reject inappropriate messages about gender online.

Online Relationships

- Make positive contributions and be part of online communities.
- Describe some of the communities in which I am involved and describe how I collaborate with others positively.
- Explain my responsibilities for the wellbeing of others in my online social group.
- Explain how impulsive and rash communications online may cause problems.

Online Reputation

- Explain how I am developing an online reputation which will allow others to form an opinion about me.
- Describe some simple ways that help build a positive online reputation.

Online Bullying

- Describe how to capture online bullying content as evidence (screen grabs, URL, profiles) to share with trusted adults who can help.
- Identify a range of ways to report concerns both in school and at home about online bullying.

Computing Progression Map – Online Safety

Year 6 continued

Online Information

- Explain how search engines work and how results are selected and ranked.
- Demonstrate the strategies to apply to evaluate digital content analytically.
- Describe how some online information can be opinion and give examples.
- Explain how and why some people may present opinions as facts.
- Define the terms 'influence', 'manipulation' and 'persuasion' and explain how these might be encountered online.
- Identify, flag and report inappropriate content.

Health, Wellbeing and Lifestyle

- Assess and action different strategies to limit the impact of technology on my health, eg. night mode, regular breaks, correct posture, sleep, diet and exercise.
- Explain the important of self-regulating the use of technology and demonstrate the strategies I use to do this, eg. monitoring time online, ensuring other activities such as homework are completed first.

Privacy and Security

- Explain what app permissions are and give some examples from technology and services I use.
- Describe simple ways to increase privacy on apps and services that provide privacy settings.
- Describe ways in which some online content targets people to gain money or information illegally.
- Describe strategies to help me identify such content eg. scams, phishing.

Copyright and Ownership

- Demonstrate how to make references to and acknowledge sources I have used from the internet.

Computing Progression Map – Data and Information

Year 3

- Create questions with yes / no answers
- Identify the attributes needed to collect data about an object
- Create a branching database
- Explain why it is helpful for a database to be well structured
- Plan the structure of a branching database
- Create an identification tool

Year 4

- Explain that data gathered can be used to answer questions
- Use a digital device to collect data automatically
- Explain that a data logger collects 'data points' from sensors over time
- Recognise how a computer can help us analyse data
- Identify the data needed to answer questions
- Use data from sensors to answer questions

Year 5

- Use a form to record information
- Compare paper and computer-based databases
- Outline how you can answer questions by grouping data
- Explain that tools can be used to select specific data
- Explain that computer programs can be used to compare data visually
- Use a real-world database to answer questions

Year 6

- Create a data set in a spreadsheet
- Build a data set in a spreadsheet
- Explain that formulas can be used to produce calculated data
- Apply formulas to data
- Create a spreadsheet to plan an event
- Choose suitable ways to present data

Computing Progression Map – Programming

Year 3

- Explore a new programming environment
- Identify that commands have an outcome
- Explain that a program has a start
- Recognise that a sequence of commands can have an order
- Change the appearance of a project
- Create a project from a task description
- Explain how a sprite moves in a project
- Create a program to move a sprite in four directions
- Adapt a program to a new context
- Develop a program by adding features
- Identify and fix bugs in a program
- Design and create a maze-based challenge

Year 4

- Identify that accuracy in programming is important
- Create a program in a text-based language
- Explain what 'repeat' means
- Modify a count-controlled loop to produce a given outcome
- Decompose a task into small steps
- Create a program that uses count-controlled loops
- Develop the use of count-controlled loops
- Explain that there are infinite loops and count controlled loops
- Develop a design that includes two or more loops
- Modify an infinite loop in a given program
- Design a project that includes repetition
- Create a project that includes repetition

Year 5

- Control a simple circuit connected to a computer
- Write a program that includes count-controlled loops
- Explain that a loop can stop when a condition is met
- Explain that a loop can be used to repeatedly check whether a condition has been met
- Design a physical project that includes selection
- Create a program that controls a physical computing project
- Explain how selection is used in computer programs
- Relate that a conditional statement connects a condition to an outcome
- Explain how selection directs the flow of a program
- Design a program which uses selection
- Create a program which uses selection
- Evaluate my program

Year 6

- Define a 'variable' as something that is changeable
- Explain why a variable is used in a program
- Choose how to improve a game by using variables
- Design a project that builds on a given example
- Use a design to create a project
- Evaluate a project
- Create a program to run on a controllable device
- Explain that selection can control the flow of a program
- Update a variable with a user input
- Use a conditional statement to compare a variable to a value
- Design a project that uses inputs and outputs on a controllable device
- Develop a program to use inputs and outputs on a controllable device

Computing Progression Map – Computing Systems and Networks

Year 3

- Explain how digital devices function
- Identify input and output devices
- Recognise how digital systems can change the way we work
- Explain how a computer network can share information
- Explore how digital devices can be connected
- Recognise the physical components of a network

Year 4

- Describe how networks physically connect to other networks
- Recognise how networked devices make up the internet
- Outline how websites can be shared via the World Wide Web
- Describe how content can be added and accessed on the WWW
- Recognise how the content of the WWW is created by people
- Evaluate the consequences of unreliable content

Year 5

- Explain that computers can be connected together to form systems
- Recognise the role of computer systems in our lives
- Experiment with search engines
- Describe how search engines select results
- Explain how search results are ranked
- Recognise why the order of results is important, and to whom

Year 6

- Explain the importance of internet addresses
- Recognise how data is transferred across the internet
- Explain how sharing information online can help people to work together
- Evaluate different ways of working together online
- Recognise how we communicate using technology
- Evaluate different methods of online communication

Computing Progression Map – Creating Media

Year 3

- Explain that animation is a sequence of drawings or photographs
- Relate animated movement with a sequence of images
- Plan an animation
- Identify the need to work consistently and carefully
- Review and improve an animation
- Evaluate the impact of adding other media to an animation
- Recognise how text and images convey information
- Recognise that text and layout can be edited
- Choose appropriate page settings
- Add content to a desktop publishing publication
- Consider how different layouts can suit different purposes
- Consider the benefits of desktop publishing

Year 4

- Identify that sound can be recorded
- Explain that audio recordings can be edited
- Recognise the different parts of creating a podcast
- Apply audio editing skills independently
- Combine audio to enhance a podcast product
- Evaluate the effective use of audio
- Explain that the composition of digital images can be changed
- Explain that colours can be changes in digital images
- Explain how cloning can be used in photo editing
- Explain that images can be combined
- Combine images for a purpose
- Evaluate how changes can improve an image

Year 5

- Explain what makes a video effective
- Identify digital devices that can record video
- Capture video using a range of techniques
- Create a storyboard
- Identify that video can be improved through editing
- Consider the impact of the choices when making a video
- Identify that drawing tools can be used to produce different outcomes
- Create a vector drawing by combining shape
- Use tools to achieve a desired effect
- Recognise that vector drawings consist of layers
- Group objects to make them easier to work with
- Apply what has been learned about vector drawing

Year 6

- Review an existing website and consider its structure
- Plan the features of a web page
- Consider the ownership and use of images (copyright)
- Recognise the need to preview pages
- Outline the need for a navigation path
- Recognise the implication of linking to content owned by others
- Recognise that you can work in three dimensions on a computer
- Identify that digital 3D objects can be modified
- Recognise that objects can be combined in a 3D model
- Create a 3D model for a given purpose
- Plan my own 3D model
- Create my own digital 3D model