Year 3

Collecting, Evaluating and Presenting Information

Organising, Creating and Presenting

- Add text, borders and images making the appropriate choices regarding position, size, colour and theme.
- Present work clearly and for appeal/interest. Use tools to layer and arrange images and text so can be clearly seen/read.
- Take photos and mask the background to make the image transparent. Upload and layer onto other images.
- Create and animation use onion skinning technique and save as a GIF. Embed the GIF into another document.

QR Codes

- Create QR codes using a QR code generator. Understand how the QR code links to the location of where the information is stored. Create QR codes that link to different media e.g. websites, audio files, notes to provide easily accessible information.
- Scan QR codes to access information easily. Understand that each QR code is unique and can only link to one location/ information source.
- Record an audio file and create a QR code to share its location with others.

Data Handling

Creating a branching database and interrogating simple databases

- Know what characteristics are and how to use them to sort groups of objects by using yes/no questions. Use a branching database to answer questions.
- Know that yes/no questions need to be ordered carefully when grouping objects to create the structure for a branching database.
- Know that the term 'database' and how they are used to store and organise data using key characteristics.
- Use tools within a database to order and answer questions about the data using simple searches.
- Develop search techniques to match data from more than one field using 'AND' and 'OR' to refine results.
- Know that a database may contain errors and can affect search results.

Computer Science and Programming

Write a program part 1 – block-based sequences

- Decompose a task into smaller parts and give precise instructions in sequence to complete a task.

Digital Literacy

Self- Image and Identity

- I can explain what is meant by the term 'identity'
- Explain how people can represent themselves in different ways online.

• Know how to use block-based programming, using Motion blocks, to move a sprite forward and backwards. • Read and follow a block-based program to identify and correct errors that prevent the desired outcome from being achieved. • Use Look blocks in sequence using block-based programming and specify a time to display the look before changing to another look block command. • Use delay commands from the Control blocks to structure the sequence to achieve the desired timing outcomes. • Identify inputs and outputs within a program. Use inputs to trigger events within the code. • **Write a program part 2 – drawing shapes.** • Use logical reasoning to follow and give precise instructions, including identifying errors and correcting them. • Use sequencing to create algorithms and identify patterns when drawing a simple polygon. Make the algorithm efficient by using repetition where patterns have been identified. Encode algorithm to block-based programming. • Use coding blocks that draw single polygons and embed these within a nested loop to extend the use of repetition to draw repeated shape patterns.	• Explain ways in which someone might change their identity depending on what they are doing online (e.g. gaming, using an avatar, social media and why.) **Online Relationships** • Describe ways people have similar likes and interests can get together online. • Explain what it means to 'know someone' online and why this might be different from knowing someone offline. • Explain what is meant by 'trusting someone online' why this is different from 'liking someone online' and why it's important to be careful about who to trust online including what information and content they are trusted with. • Explain why someone may change their mind about trusting anyone with something if they feel nervous, uncomfortable or worried. • Explain how someone's feelings can be hurt by what is said or written online. • Explain the importance of giving and gaining permission before sharing things online; how the principles of sharing online is the same as sharing offline. E.g. sharing images and videos. **Online Reputation** • Explain how to search for information about others online and give examples of what anyone may or may not be willing to share about themselves online. As well as the need to be careful before sharing anything personal. • Explain who someone can ask if they are unsure about putting something online. **Online Bullying**

	• Describe appropriate ways to behave towards other people online and why this is important. Give examples of how bullying behaviour could appear online and how someone can get support. **Copyright and Ownership** • Explain why copying someone else's work from the internet without permission isn't fair and can explain what problems this might cause. **Privacy and Security** • Describe simple strategies for creating and keeping passwords private and how connected devices can collect and share anyone's information with others. • Give reasons why someone should only share information with people they choose to and trust. I can explain that if they are not sure of feel pressured then they should tell a trusted adult. **Health, Well-Being and Lifestyle** • Can explain why spending too much time using technology can sometimes have a negative impact on anyone; give some examples of both positive and negative activities where it is easy to spend a lot of time engaged. • Explain why some online activities have age restrictions, why it is important to follow them and know who to talk to if others pressure me to watch or do something online that makes me feel uncomfortable. **Managing Online Information** • Can demonstrate how to use key phrases in search engines to gather accurate information online as well as explaining what autocomplete is and how to choose the best suggestion. • Can explain how the internet can be used to sell and buy things.

	• Explain the difference between a 'belief' an 'opinion' and a 'fact' and can give examples of how and where they might be shared online. Explain that not all opinions shared may be accepted as true or fair by others. • Describe and demonstrate how we can get help from a trusted adult if we see content that makes us feel sad, uncomfortable, worried or frightened.

Year 4

Collecting, Evaluating and Presenting Information

Multimedia Fact File

- To know how to present information on a page using text and images. Plan a non-linear presentation, making appropriate choices for layout and content to present the information clearly. Be aware of copyright issues surrounding the use of images online.
- To know and use different ways of presenting information to make the content more engaging and accessible through the use of sound files and embedded videos.
- Create multiple pages for their presentation and use the hyperlinks to link them together as detailed in their planning to create a non-linear presentation.

Data Handling

Creating and interrogating simple databases

- To locate data organised in a paper-based record card database, identifying fields and data to answer specific questions.
- Design a questionnaire using a range of data types and open and closed questions to gather useful data that is fit for purpose to solve a given problem.
- Use an electronic database to look at how data can be recorded. Enter data to create records under appropriate field names.
- Use an electronic database to examine how data can be viewed, sorted and searched for.
- Create and use charts to visually compare data and answer questions about it.

Computer Science and Programming

What is Computer Technology

- To understand what a computer is and to know the difference between hardware and software, and to differentiate between input and output devices.
- To understand what the main parts of a computer are called and what their function is.
- Know where and how internal components of a computer, such as the CPU, RAM and hard drive are located and how they work together to process the data.
- Know how data is stored and processed as binary digits in the form of bytes by the CPU and RAM. Use ASCII to decode bytes.

Digital Literacy

Self-image and Identity

- Explain how my online identity can be different to my offline identity.
- Describe positive ways for someone to interact with others online and understand how this will positively impact on how others perceive them.
- Explain that others online can pretend to be someone else, including my friends, and can suggest reasons why they might do this.

Online Relationships

- Describe strategies for safe and fun experiences in a range of online social environment's (e.g. livestreaming, gaming platforms)
- Give examples of how to be respectful to others online and describe how to recognise healthy and unhealthy online behaviours.

- Know how simple binary image data is sored and processed by the CPU and RAM, and displayed on screen in the form of pixels. Know that coloured images have more data per pixel than black and white images and they are saved as larger data files.

Scratch Programming – from algorithm to code

- Edit a sprites costume using the drawing tools and create a program using block-based coding to change the costumes of the sprite using Looks command block and a loop and a delay from the Control command blocks.

- Programme several sprites that each have a different Event block that controls the start of each program. Include a variety of Looks and Motion command blocks to change the appearance and position of each of the sprites, using Control command blocks to delay between changes where necessary.

- Programme several sprites that each have a variety of Looks and Music command blocks to change the appearance and audio played for each sprite. Include two forms of repetition from the Control command blocks – a count-controlled loop and a continuous loop to control the number of iterations that occur.

- To use broadcasting as a method to direct the timing of events within code to trigger a script to run.

On the Move with Programming

- Control a sprite to move on the stage. Adding code so a sprite will go to an exact position on the stage.

- Control a sprite to move with the mouse pointer.

- Explain how content shared online may feel unimportant to one person but may be important to other people's thoughts feelings and beliefs.

Online Reputation

- Describe how to find out information about others online by searching online.

- Explain ways that some of the information about anyone online could have been created, copied or shared by others.

Online Bullying

- Can recognise when someone is upset, hurt or angry online, and can describe ways people can be bullied through a range of media (e.g. image, video, text, chat)

- Explain why people need to think carefully about how content they post might affect others, their feelings and how it may affect how others feel about them (their reputation)

Managing Online Information

- Analyse information to make a judgement about probable accuracy and I understand why it is important to make my own decisions regarding content and that my decisions are respected by others.

- Describe how to search for information within a wide group of technologies and make a judgement about the probable accuracy (e.g. social media, image sites, video sites.)

- Describe some of the methods used to encourage people to buy things online (e.g. advertising offers; in-app purchases, pop-ups) and can recognise some of these when they appear online.

- Explain why lots of people sharing the same opinions or beliefs online do not make those opinions or beliefs true.

• Control a sprite to move using the arrow keys, changing costumes and the direction that the sprite faces to improve the aesthetics of movement. • Know that when selection/ conditional statements if… then… are used a decision is made based on inputs received that determine which output is achieved. • Design and create a simple maze game that includes controlling the movement of a sprite with the mouse or arrow keys, using selection to detect maze walls/ objects that trigger another event.	• Explain that technology can be designed to act like or impersonate living things (e.g. bots) and describe what the benefits and risks might be. • Explain what is meant by fake news e.g. why some people will create stories or alter photographs and put them online to pretend something is true when it isn't. **Health, Well-being and Lifestyle** • Explain how using technology can be a distraction from other things, in both a positive and negative way. • Identify times or situations when someone may need to limit the amount of time they use technology e.g. I can suggest strategies to help with limiting this time. **Privacy and Security** • Describe strategies for keeping personal information private, depending on context. • Explain that the internet use is never fully private and is monitored e.g. adult supervision. • Describe how some online services may seek consent to store information about me; I know how to respond appropriately and who I can ask if unsure. • Know what the digital age of consent is and the impact this has on online services asking for consent. **Copyright and Ownership** • When searching on the internet for content to use, can explain why you need to consider who owns it and whether if they have the right to reuse it.

	• Can give simple examples of content which cannot be reused without permission from the owner, e.g. videos, music, images.

Year 5

Collecting, Evaluating and Presenting Information

Infographics

- Know that an infographic is a creative way of presenting key information through text, images, tables, charts and graphs
- Know how colour can be used to enhance ways of presenting information, making careful choices regarding legibility and the intended effect on mood and associations
- Make choices about the style of text and images to use. Understand about copyright issues on images and abide by licences
- Organise and present information in the style of an infographic

Data Handling

Creating and using spreadsheets as models to solve problems.

- Organise data into columns and rows to create own data sets and apply formulae using cell references that include a range of cells to calculate data.
- Use a spreadsheet to answer questions and identify that changing inputs will change the output of a calculation where formula is used.
- Create a spreadsheet by organising data into columns and rows using appropriate heading and create simple formulae using the four basic math operations (+, -, x and ÷) using cell references where appropriate to calculate the data to model and answer questions.
- Create a spreadsheet by organising data into columns and rows using appropriate headings and create formulae, including minimum, maximum and average, using cell references to calculate the data.
- Design a spreadsheet to model a real-life problem using appropriate formulae using cell references to calculate data. Create graphs to display data to evaluate results in comparison to the problem being modelled.

Computer Science and Programming

Programming Making Games

- Use sequence, repetition, and selection to link and control the movement of one sprite with another when conditions are met using sensing blocks related to sprites or colours as an input.
- Use sequence, repetition and multiple selection blocks to control the movement of a sprite when conditions are met using a variety of keyboard keys as inputs to control a sprite.

Digital Literacy

Self-Image and Identity

- Explain how identity online can be copied, modified or altered.
- Demonstrate how to make responsible choices about having an online identity, depending on context.

Online Relationships

- Give examples of technology-specific forms of communication (emojis, memes and GIFs).

- Use sequence, repetition and selections. Create own variables and include them within a program to keep track of a score.

- Use sequence, repetition and selection. Include the use of operators to allow for a range of values to be included under the selection/ conditional blocks.

- Use sequence, repetition and selection to create procedures and sub procedures. Use procedures effectively, as part of abstraction, to help simplify complex code.

Micro: Bit

- A micro: bit is a tiny computer which needs instructions to make it work and can receive inputs and produce outputs.

- Recognise and locate key hardware components on the micro: bit such as its display, speaker and accelerometer.

- Make a program that requires inputs (event commands as above) that produce an output Use the simulator within the Freecode micro: bit environment to test code before transferring to micro: bit.

- Use the transfer feature to move code to a micro: bit. Recognise how the order of code is essential in order to meet a program's intentions.

- Use the repeat forever command within a sequence of code to produce an infinite looping sequencing such as a beating heart animation

- Explain that there are some people I communicate with online who may want to do me or my friends harm and recognise that this is not my/ our fault.

- Describe some of the ways people may be involved in online communities and describe how they might collaborate constructively with other and make positive contributions (e.g. gaming communities or social media groups)

- Explain how someone can get help if they are having problems and identify when to tell a trusted adult.

- Demonstrate how to support others (including those who are having difficulties) online.

Online Reputation

- Search for information about an individual online and summarise the information found.

- Describe ways that information about anyone online can be used to make judgements about an individual and why these may be incorrect.

Online Bullying

- Recognise online bullying can be different to bullying in the physical world and can describe some of those differences.

- Describe how what one person perceives as playful joking and teasing (including 'banter') might be experienced by others as bullying.

- Explain how anyone can get help if they are being bullied online and identify when to tell a trusted adult.

- Identify a range of ways to report concerns and access support both in school and at home about online bullying.

	• Explain how to block abusive users. • Describe the helpline services which can help people experience bullying, and how to access them (e.g. Childline or The Mix) **Managing Online Information** • Explain the benefits and limitations of using different types of search technologies and how some technology can limit the information presented. • Explain what is meant by being sceptical and give examples of when and why it is important to be sceptical. • Evaluate digital content and explain how to make choices about what is trustworthy and explain key concepts including information, reviews, fact, opinion, belief, validity, reliability and evidence. • Identify ways the internet can draw us to information for different agendas, describe ways of identifying when online content has been commercially sponsored or boosted. • Explain what is meant by the term stereotype how these are amplified and reinforce online and why accepting stereotypes may influence how people think about others. • Describe how fake news may affect someone's emotions and behaviour and explain why this may be harmful. • Explain what is meant by a hoax and why someone would need to think carefully before they share. **Health, Well-Being and Lifestyle**

	• Describe ways technology can affect health and well-being both positively and negatively. • Describe strategies, tips or advice to promote health and wellbeing with regards to technology. • Recognise the benefits and risks of accessing information about health and well-being online and how we should balance this with talking to trusted adults and professionals. • Explain how and why some apps and games may request or take payment for additional content and explain the importance of seeking permission from a trusted adult before purchasing. **<u>Privacy and Security</u>** • Explain what a strong password is and demonstrate how to create one. • Explain how many free apps or services may read and share private information with others and explain what app permissions are and give some examples. **<u>Copyright and ownership</u>** • Assess and justify when it is acceptable to use the work of others and can give examples of content that is permitted to be reused and know how this content can be found online.

Year 6

Collecting, Evaluating and Presenting Information

Understanding Big Data

- Understand how our data can be actively and passively collected, stored and used by others when we connect to the Internet.
- Know that data can't be collected by companies without prior consent from the user. Understand the importance of terms and conditions and a user's 'choice' to allow data to be collected, stored and shared.
- Know how data can be accessed and used without user consent or knowledge through hacking. Understand that hacking is a criminal offence and ethical hacking is not.
- Know that a cookie is used by websites to remember you, your preferences, and your habits online.

Artificial Intelligence and Machine Learning

- Know how to be discerning in evaluating digital content showing an awareness of misinformation and disinformation.
- Recognise features that could indicate if an image or video has been generated with AI.
- To know what AI is and identify everyday uses of AI.
- Understand the basics of Artificial Intelligence (AI) and Machine Learning (ML) by exploring how computers use large amounts of data to learn and make decisions. They will recognise that this data is used to train ML models.
- Write data examples that can be used to train a Machine Learning Model to switch a fan/lamp on/off.

Data Handling

Analyse and Interpret Data Using Spreadsheets

- Create formulae using cell references, including a range of cells to produce calculated data.
- Create formulae using the four basic maths functions (+, -, x, ÷) and cell addresses where appropriate, using brackets to order mathematical operations.
- Apply appropriate number and text formats to cells. Remove and add data to a spreadsheet and adjust formulae where required. Use the spreadsheet model to answer questions that model real-life events.
- Create a spreadsheet by organising data into columns and rows using appropriate headings and create simple formulae using the four basic math operations (+, -, x, ÷) using cell references where appropriate to calculate the data to model and answer questions.
- Add data to a pre-populated spreadsheet and use formulae, using cell addresses and cell ranges where appropriate to model real-life scenarios and answer questions.

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• Identify and explain advantages and disadvantages of Artificial Intelligence (AI) using real-life examples, demonstrating an understanding of how AI impacts daily life.	
Computer Science and Programming **The Internet and World-Wide Web** • To create a drawing and text that explains what the Internet and WWW are. • Know what is involved in the process of requesting information from the Internet, how it is received by relevant components and returned to the user's device. • Know how data is broken into packets to travel from one location to another on the Internet when requested. • Know how search engines work to index web pages and rank results returned to the user. • Know how to effectively use search terms and read the anatomy of a web address to find more accurate and relevant sources of information on the web. **Micro: Bits** • Create code that uses a range of inputs to control different outputs. • Use a micro: bit to transmit and receive data using Bluetooth signals. Design codes with inputs, outputs, variables and selection to achieve this. Use a cipher to send messages. • Create and modify code to detect the strength of radio signals from a transmitter to receive data.	**Digital Literacy** **Self-Image and Identity** • Identify and critical evaluate online content relating to gender, race, religion, disability, culture and other groups and explain why it is important to challenge and reject inappropriate representations online. • Describe issues online that could make anyone feel sad, worried, uncomfortable or frightened and give examples of how to get help both offline and online. • Explain the importance of asking until I get the help I need. **Online Relationships** • Explain how sharing something online may have an impact either positively or negatively. • Describe how to be kind and show respect for others online including the importance of respecting boundaries regarding what is shared about them online and how to support them if others do not. • Describe how things shared privately online can have unintended consequences for others. • Explain that taking or sharing inappropriate images of someone even if they say it is okay, may have an impact for the sharer and others; and who can help if someone is worried about this. **Online Reputation**

• Create code for a receiver. Create code for a transmitter to transmit data/ information automatically when a receiver is in a specific range. • Understand the difference between a conductor and non-conductor. Create a program using pins on a micro: bit to make a circuit to test different materials to see if electricity flows through them. • Create a transmitter program using pins to make a circuit and Bluetooth to send an automated signal to a receiver when the circuit is broken. Create a receiver program to receiver a Bluetooth signal and display the data/information. **Computer Aided Design (CAD)** • Navigating a 3D space and manipulating objects • Experiment by combining, grouping and refining objects • Understand how designers and engineers use CAD • Understand how complex objects can be built form simple shapes • Design objects to specific requirements	• Explain the ways in which anyone can develop a positive online reputation. Explain strategies anyone can use to protect their digital personality and online reputation, including degrees of anonymity. **Online Bullying** • Can describe how to capture bullying content as evidence to share with others who can help me and explain how someone would report online bullying in different contexts. **Managing Online Information** • Explain how search engines work and how results are selected and ranked, how to use search technologies effectively and describe how some online information can be opinion and can offer examples. • Explain how and why some people may present opinions as facts; why the popularity of an opinion or the personalities of those promoting it does not necessarily make it true, fair or perhaps even legal. • Define the terms influence, manipulation and persuasion and explain how someone might encounter these online. • Understand the concept of persuasive design and how it can be used to influence peoples' choices. • Demonstrate how to analyse and evaluate the validity of 'facts' and information and explain why using these strategies are important. • Explain how companies and news providers target people with online news stories they are more likely to engage with and how to recognise this. • Describe the difference between online misinformation and dis-information. Explain why information that it is on a large number of sites may still be

	inaccurate or untrue and assess how this might happen. Identify, flag and report inappropriate content. **Health, Well-Being and Lifestyle** • Describe common systems that regulate age content and describe their purpose. • Recognise and discuss the pressures that technology can place on someone and how/when they could manage this. Can recognise features of persuasive design and how they are used to keep users engaged. • Assess and action different strategies to limit the impact of technology on health. **Privacy and Security** • Describe effective ways people can manage passwords; explain what to do if a password is shared, lost or stolen. • Describe how and why people should keep their software and apps up to date; describe simple ways to increase privacy on app 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 identify such content. • Know that online services have terms and conditions that govern their use. **Copyright and ownership** • Demonstrate the use of search tools to find and access online content which can be reused by other • Demonstrate how to make references to and acknowledge sources used from the internet.