Carr Hill Community Primary School
Knowledge Organiser

Key Stage Two	Year 3	Computing	Branching Databases

Key Knowledge

What is a database?

A database is a computerised system that makes it easy to search, select and store information.

- Databases are used in many different places.
- Your school might use a database to store information about attendance or to store pupil's and teachers' contact information.

Records and Fields

- Databases store data in tables.
- Tables are made up of fields and records.
- A hospital might use a database to keep records of its patients. A patient's record may contain the follow fields: 1) First name 2) Last name 3) Height 4) Release Date
- A table consists of related records, eg patients, and a record consists of related fields, eg Paul Smith who is 1.8m and was released on 26.01.2019.

Grouping & Separating

Grouping- Objects can be put into different groups. These groups can be made up of objects that are the same,or that have the same attributes (features)

Yes & No Questions

Questions that require yes and no naswers can be useful for helping us to find out the attributes of different objects
For example:
Is it big?(size)
Is it red? (colour)
Is it made of plastic? (material)

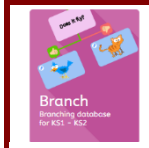
Multiple Groups

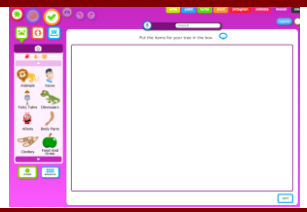
Sometimes we need to split objects into more than 2 groups and one yes or no question is not enough
For example: we may wish to classify animals into different types for example: reptiles, mammals and birds

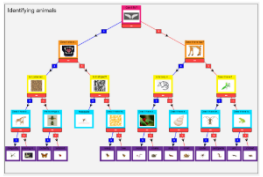
Key Vocabulary

Spelling	Definition/Sentence
Branching Database	A way of classifying a group of objects
Data	Facts and statistics collected together that can provide information.
Collate	Collect and combine (texts, information, or data).
field	The group data is organised into
File	A set of record cards

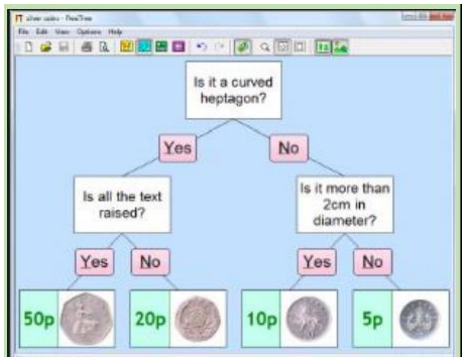
Programs and Apps







Examples of Databases



Year 3 – Databases

During this unit, learners will develop their understanding of what a branching database is and how to create one. They will gain an understanding of what attributes are and how to use them to sort groups of objects by using yes/no questions. The learners will create physical and on-screen branching databases. Finally, they will evaluate the effectiveness of branching databases and will decide what types of data should be presented as a branching database.

Lesson	Brief overview	Learning objectives
1. Yes or no questions	During this lesson, learners will start to explore questions with yes or no answers, and how these can be used to identify and compare objects. They will create their own yes or no questions before using these to split a collection of objects into groups.	To create questions with yes/no answers • I can investigate questions with yes/no answers • I can make up a yes/no question about a collection of objects • I can create two groups of objects separated by one attribute
2. Making groups	During this lesson, learners will continue to develop their understanding of using questions with yes or no answers to group collections of objects. They will learn how to arrange objects in a tree structure and will continue to think about which attributes the questions are related to.	To identify the object attributes needed to collect relevant data • I can select an attribute to separate objects into groups • I can create a group of objects within an existing group • I can arrange objects into a tree structure
3. Creating a branching database	During this lesson, learners will continue to develop their understanding of ordering objects/images in a branching database structure. They will learn how to use an online database tool to arrange objects into a branching database, and will create their own questions with yes or no answers. The learners will show that their branching database works through testing.	To create a branching database • I can select objects to arrange in a branching database • I can group objects using my own yes/no questions • I can prove my branching database works
4. Structuring a branching database	During this lesson, learners will continue to develop their understanding of how to create a well-structured database. They will use attributes to create questions with yes or no answers and apply these to given objects. The learners will be able to explain why questions need to be in a specific order and will compare the efficiency of different branching databases.	To explain why it is helpful for a database to be well structured • 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 compare two branching database structures
5. Using a branching database	During this lesson, learners will independently create a branching database that will identify a given object. They will continue to think about the attributes of objects to write questions with a yes or no answer, which will enable them to separate a group of objects effectively. The learners will then arrange the questions and objects into a tree structure, before using their branching database to answer questions.	To identify objects using a branching database • I can select a theme and choose a variety of objects • I can create questions and apply them to a tree structure • I can use my branching database to answer questions
6. Presenting information	During this lesson, the learners will compare two ways of presenting information. They will demonstrate their ability to explain what information is shown in a pictogram and a branching database. The learners will begin to compare the two ways of presenting information.	To compare the information shown in a pictogram with a branching database • I can explain what a pictogram tells me • I can explain what a branching database tells me • I can compare two ways of presenting information

Carr Hill Community Primary School
Knowledge Organiser

Key Stage Two	Year 3	Computing	Connecting Computers

Key Knowledge

Overview

- Technology is something that has been made by people to help us.
- Information Technology includes computers and things that work with computers
- Digital devises are things made for a particular purpose that use processing
- Digital devises have an input, process and output
- Information and data can be shared across networks

Networks and Network Devices

Connections and Networks

-In Computing, a connection describes a link between the computer and something else.

-For example, a computer may be connected to the internet through wires, a mobile data system, or WiFi.

-A computer network is a set of connections that joins computers together.

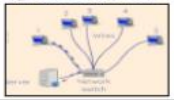
-The computers in the network can send and receive information to one another.

Network Devices

-Network switch: a device that helps different devices on a network to be connected with each other.

-Server: a computer that manages the network and stores files

Wireless access point (WAP): a device, connected to a wired network, that sends and receives wireless signals to and from devices.



Digital Devises- Input, Process anOutput (IPO)

Input: Something that sends a message to the device. E.g. You press a button on the keyboard.

Input Devices: Keyboard, joystick, mouse, web cam, microphone, touch screen, track ball, digital camera.

Process: The device acts on the message. E.g. The computer follows a program that tells it what to do when the keyboard is pressed.

Output: Something that is sent out by the device. E.g. The letter that you have typed on the screen.

Output Devices: Screen/monitor, printer, headphones, projector, speaker, smartboard.

Key Vocabulary

Spelling	Definition/Sentence
Server	A powerful computer that hi=olds the data to be shared with other computers on a network
Router	A devise which forwards data from one computer network to another.
Hard drive	A devise which stores a lot of data.
Wireless connection	Data is transmitted through radio signals and does not need wires or cables
Hub	A devise which ensures all devices on a network receive information.

Why Networks are Useful

-Computer networks allow us to send and receive information between computers that are in different places.

-Networks can help us to communicate quickly and easily.

-Networks can also join computers to shared devices, like scanners and printers.

-The internet is a global network of computers. Imagine how different life would be without the internet!

-If information is shared on a network, it helps to reduce the risk of data being lost, e.g. if one computer breaks.

Year 3 Connecting Computers

During this unit, learners develop their understanding of digital devices, with an initial focus on inputs, processes, and outputs. They also compare digital and non-digital devices. Following this, learners are introduced to computer networks, including devices that make up a network's infrastructure, such as wireless access points and switches. The unit concludes with learners discovering the benefits of connecting devices in a network.

Lesson	Brief overview	Learning objectives
1 How does a digital device work?	This lesson introduces the concepts of input, process, and output. These concepts are fundamental to all digital devices.	To explain how digital devices function • I can explain that digital devices accept inputs • I can explain that digital devices produce outputs • I can follow a process
2 What parts make up a digital device?	In this lesson, learners will develop their knowledge of input, process, and output and apply it to devices and parts of devices that they will be familiar with in their everyday surroundings.	To identify input and output devices • I can classify input and output devices • I can model a simple process • I can design a digital device
3 How do digital devices help us?	In this lesson, learners will apply their learning from lessons 1 and 2 by using programs in conjunction with inputs and outputs on a digital device. They will create two pieces of work with the same focus, using digital devices to create one piece of work, and non-digital tools to create the other. Learners will then compare and contrast the two approaches.	To recognise how digital devices can change the way we work • 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
4 How am I connected?	Many digital devices are now connected to other digital devices, e.g. computers through wires, tablets through WiFi, and smartphones through mobile phone networks. The benefit of connecting digital devices is that it allows information to be shared between users and systems. This lesson introduces the concept of connections and moving information between connected devices. Learners will learn to explain how and why computers are joined together to form networks.	To explain how a computer network can be used to share information • I can recognise different connections • I can explain how messages are passed through multiple connections • I can discuss why we need a network switch
5 How are computers connected?	This lesson introduces key network components, including a server and wireless access points. Learners will examine each device's functionality and look at the benefits of networking computers.	To explore how digital devices can be connected • I can recognise that a computer network is made up of a number of devices • 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
6 What does our school network look like?	In this lesson, learners will further develop their understanding of computer networks. They will see examples of network infrastructure in a real-world setting and relate them to the activities in the last lesson.	To recognise the physical components of a network • I can identify how devices in a network are connected with one another • I can identify networked devices around me • I can identify the benefits of computer networks

Carr Hill Community Primary School
Knowledge Organiser

Key Stage Two	Year 3	Computing	Desk Top Publishing Creating Media

Key Knowledge

Desktop Publishing is when we create documents using page layout software. We can use desktop publishing to make things like:

- newsletters
- Brochures
- Magazines

Some examples of software we can use for desktop publishing are:

- Microsoft Word
- Microsoft Publisher
- Book Creator

Microsoft Word

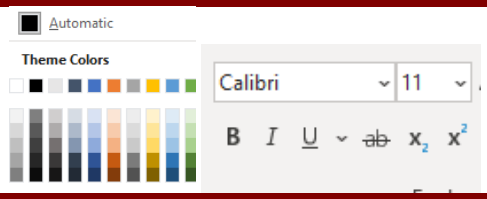
Microsoft Word is a word-processing program used for creating documents such as letters, brochures, learning activities, job applications and students' homework assignments.

Editing Text

Font (font, font, *font*, *font*)

Colour (Colour, Colour, Colour)

Size (Size, Size, Size)

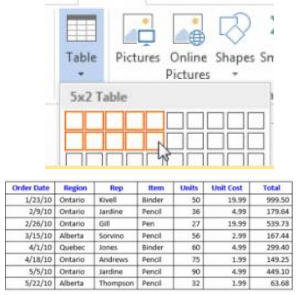


Keyboard Shortcuts

A keyboard shortcut is a combination of keys that allows the user quick access to a particular function.

Inserting Tables

Tables can be inserted to present text information and/or numerical data.



Key Vocabulary

Spelling	Definition/Sentence
Text	Text is the words you can see on screen
Format	The ways images, text and objects are arranged on a screen
Textbox	A box that you can input into a document and ad words to
Outline	A line you can add to a shape or text box
Object	An object in publishing software can be a file, a chart or a spreadsheet for example
Layout	The plan or design or arrangement of something laid out.

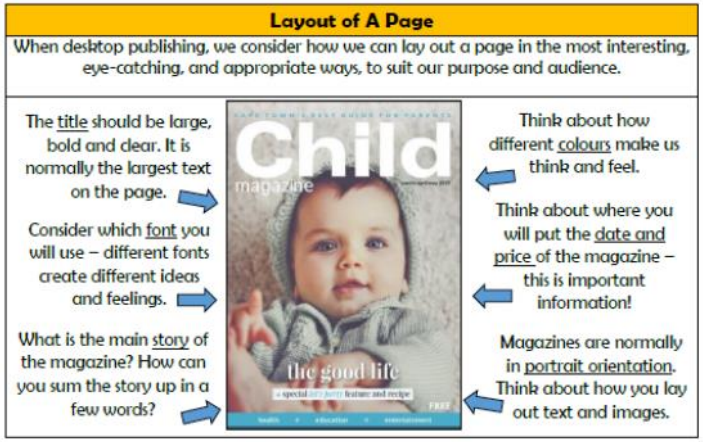
Programs and Apps

Publisher

Word

BOOK CREATOR

Examples of Databases



Year 3 – Desktop Publishing

Learners will become familiar with the terms 'text' and 'images' and understand that they can be used to communicate messages. They will use desktop publishing software and consider careful choices of font size, colour and type to edit and improve premade documents. Learners will be introduced to the terms 'templates', 'orientation', and 'placeholders' and begin to understand how these can support them in making their own template for a magazine front cover. They will start to add text and images to create their own pieces of work using desktop publishing software. Learners will look at a range of page layouts thinking carefully about the purpose of these and evaluate how and why desktop publishing is used in the real world.

Lesson	Brief overview	Learning objectives
1. Words and pictures	In this lesson, learners will become familiar with the terms 'text' and 'images' and understand that text and images need to be used carefully to communicate messages clearly. Learners will be able to give advantages and disadvantages of using text, images, or both text and images to communicate messages effectively.	To recognise how text and images convey information • I can explain the difference between text and images • I can recognise that text and images can communicate messages clearly • I can identify the advantages and disadvantages of using text and images
2. Can you edit it?	This lesson will build on last week's lesson, in which we looked at using images and text to communicate a message effectively. In this lesson we will look at desktop publishing. Learners will think about how to make careful choices regarding font size, colour, and type in an invitation. The use of the Return, Backspace, and Shift keys will be explored, and learners will be taught how to type age-appropriate punctuation marks. This will build on the typing skills learned in the Year 1 'Digital painting' unit. Learners will understand that once content has been added, it can be rearranged on the page.	To recognise that text and layout can be edited • 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
3. Great template!	Learners will be introduced to the terms 'templates', 'orientation', and 'placeholders' within desktop publishing software. The learners will create their own magazine template, which they will add content to during the next lesson. This lesson has been designed on a laptop using Adobe Spark and this is reflected in the screenshots and videos. Teachers may decide to use the Adobe Spark app, or other software such as Canva or Microsoft Publisher.	To choose appropriate page settings • I can define the term 'page orientation' • I can recognise placeholders and say why they are important • I can create a template for a particular purpose
4. Can you add content?	In this lesson, learners will add their own content (text and images) to the magazine templates they created in lesson 3. They will copy the information for the front of their magazine from a prewritten document and paste it into the chosen place on their magazine cover. Images will be added from within the search facility in Adobe Spark. Teachers could ask learners to gather copyright-free images from http://www.pixabay.com if using a different application.	To add content to a desktop publishing publication • I can choose the best locations for my content • I can paste text and images to create a magazine cover • I can make changes to content after I've added it
5. Lay it out	In this lesson, learners will think about the different ways information can be laid out on a page. They will look at a range of page layouts such as letters and newspapers and begin to think about the purpose of each of these.	To consider how different layouts can suit different purposes • I can identify different layouts • I can match a layout to a purpose • I can choose a suitable layout for a given purpose
6. Why desktop publishing?	In this lesson, learners will explain what desktop publishing means in their own words. They will think about how desktop publishing is used in the wider world and consider the benefits of using desktop publishing applications.	To consider the benefits of desktop publishing • I can identify the uses of desktop publishing in the real world • I can say why desktop publishing might be helpful I can compare work made on desktop publishing to work created by hand

Carr Hill Community Primary School
Knowledge Organiser

Key Stage Two	Year 3	Computing	Stop-frame Animation

Key Knowledge

What is animation?

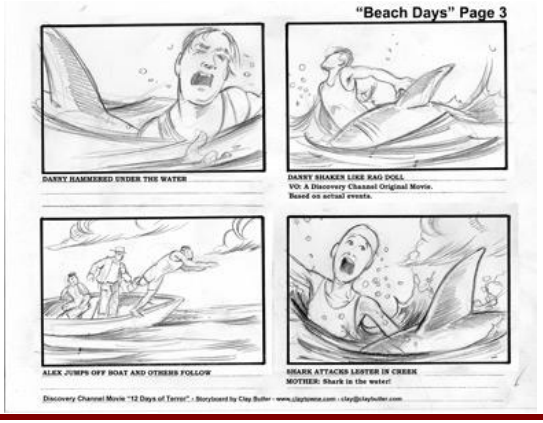
- Animation is the process of giving the illusion of movement to drawings, models, or inanimate objects.
- Animated motion pictures and television shows are highly popular forms of entertainment.
- When images are quickly shown together, the objects appear to move! (they are animated)

Stop-frame Animation

- In stop motion animation objects are physically manipulated in small steps.
- This is done between individually photo- graphed frames so that they appear to move independently when the e series of frames is played back in fast sequence.
- One second of stop motion animation is made up of 12 frames.
- Creating stop motion animation can take a considerable amount of time.
- Wallace and Gromit is a type of stop motion animation called Claymation.
- The feature length film 'Curse of the 'Were Rabbit' took 15 months to film as the creators had to manipulate and move the clay models.

Story boards

Storyboards can be used to plan animations. They help you to plan your different frames .



Key Vocabulary

Spelling	Definition/Sentence
animation	The process of giving the illusion of movement to drawings, models, or inanimate objects.
backdrop	The scenery or ground behind something.
flip book	A series of illustrations bound together in sequence so that an illusion of movement can be created by flipping them rapidly
frame	A still image.
onion skinning	Onion skinning is a 2D computer graphics term for a technique used in creating animated cartoons and editing movies to see several frames at once.
stop-motion	Animation that is captured one frame at a time with objects that are moved between frames.

Programs and Apps

iMotion

Do ink

Zing Studio

Examples of Animation

Year 3 – Stop-frame Animation

Learners will use a range of techniques to create a stop-frame animation using tablets. Next, they will apply those skills to create a story-based animation. This unit will conclude with learners adding other types of media to their animation, such as music and text.
It is recommended that you use a tablet for this unit as this makes it simpler for learners to take the photos and do the editing. However, you could use stop-frame animation software on a desktop or laptop if this is what you have available. This unit uses screenshots from iMotion which is an iPad app, but you could also try Stop Motion Studio if you have Android tablets.

Lesson	Brief overview	Learning objectives
1 Can a picture move?	Learners will discuss whether they think a picture can move. They will learn about simple animation techniques and create their own animations in the style of flip books (flick books) using sticky notes.	To explain that animation is a sequence of drawings or photographs • I can draw a sequence of pictures • I can create an effective [Text Wrapping Break]flip book—style animation • I can explain how an animation/flip book works
2 Frame by frame	In the previous lesson, learners created their own flip book–style animations. In this lesson, they will develop this knowledge and apply it to make a stop-frame animation using a tablet.	To relate animated movement with a sequence of images • I can predict what an animation will look like • I can explain why little changes are needed for each frame • I can create an effective stop-frame animation
3 What's the story?	Remind the learners of the animations that we created last week and tell them that next week we will use tablets to animate some of our own stories. Tell the learners that during this lesson they will create a storyboard showing the characters, settings and events that they would like to include in their own stop-frame animation next week.	To plan an animation • I can break down a story into settings, characters and events • I can describe an animation that is achievable on screen • I can create a storyboard
4 Picture perfect	In the previous lesson, learners planned out their own stop-frame animations in a storyboard. This lesson, they will use tablets to carefully create stop-frame animations, paying attention to consistency.	To identify the need to work consistently and carefully • I can use onion skinning to help me make small changes between frames • I can review a sequence of frames to check my work • I can evaluate the quality of my animation
5 Evaluate and make it great!	Last lesson, learners created their own stop-frame animations. This lesson, they will evaluate their animations and try to improve them by creating a brand-new animation based on their feedback.	To review and improve an animation • I can explain ways to make my animation better • I can evaluate another learner's animation • I can improve my animation based on feedback
6. Why desktop publishing?	In this lesson, learners will explain what desktop publishing means in their own words. They will think about how desktop publishing is used in the wider world and consider the benefits of using desktop publishing applications.	To consider the benefits of desktop publishing • I can identify the uses of desktop publishing in the real world • I can say why desktop publishing might be helpful • I can compare work made on desktop publishing to work created by hand

Carr Hill Community Primary School
Knowledge Organiser

Key Stage Two	Year 3	Computing	Sequencing Sounds

Key Knowledge

Overview

- Programming is when we make a set of instuctions for computers to follow
- Scratch is a program that we can use in order to code our own stories and animations. We can use an event and action command blocks in order to make sprites carry out acts when certain prompts take place
- We use algorithms (a set of instructions to perform a task) to sequence movements, actions and sounds in order to program effective animations

The Basics of Scratch

-**What is Scratch?** Scratch is a website/ app that lets us code our own stories, games and animations.

-Scratch helps us to learn how to use programming language, whilst also being creative and using problem-solving skills.

There are three main areas in Scratch:

-The Blocks Palette (on the left) contain all of the different blocks: puzzle piece commands which control the animation.

-Code Area (in the middle) is where the blocks are placed to create a program.

-Stage with Sprite (right) is where the output of the program is presented. The sprite is the character.

Adding/Removing Sprites: This can be done here, at the bottom of the stage. There are many sprites to choose from.

Attributes: There are three attributes of the sprite which we can change to make our animation: Code, Costumes, Sounds.

-**Backdrops**: Backdrops can be added by clicking on this icon (bottom right of the screen, below the stage).

Key Vocabulary

Spelling	Definition/Sentence
Coding	Computer programmes are made using a special language called code. Coding is used so computers understand what to do.
Debug	Finding an issue in a programme and repairing it.
Input	Data that a computer receives.
Variables	Something that can be changed. They are used to store information that might change
Repetition	Looping or repeating sections of a computer program
Logical reasoning	Used to explain how simple algorithms work and to detect and correct errors in programs
Selection	How a computer executes a set of instructions depending on if certain conditions have been met or not.
Output	Data that a computer sends
Sequence	A series of events that must be performed in order to achieve a task.
Sprite	A sprite is a graphic that is designed to be part of a larger scene. It can either be a static image or an animated

Sequencing and Algorithms

-A **sequence** is a pattern or process in which one thing follows another.

-In Scratch, blocks can stack vertically on top of one another to create sequences.

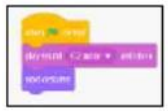
-**Event blocks** are used to start sequences. They are orange and have a curved shape at the top.

-Designing an **algorithm** (set of instructions for performing a task) will help you to program the sequence that you require.

Making Music

-Several sprites, each following connected sound sequences, can create music!

-In order to do this, you will need to **carefully plan your algorithm.**



-If your animation does not work correctly the first time, remember to **debug** it.

Year 3 Sequencing sounds

This unit explores the concept of sequencing in programming through Scratch. It begins with an introduction to the programming environment, which will be new to most learners. They will be introduced to a selection of motion, sound, and event blocks which they will use to create their own programs, featuring sequences. The final project is to make a representation of a piano. The unit is paced to focus on all aspects of sequences, and make sure that knowledge is built in a structured manner. Learners also apply stages of program design through this unit.

Lesson	Brief overview	Learning objectives
1. Introduction to Scratch	This lesson introduces learners to a new programming environment: Scratch. Learners will begin by comparing Scratch to other programming environments they may have experienced, before familiarising themselves with the basic layout of the screen.	• To explore a new programming environment • I can identify the objects in a Scratch project (sprites, backdrops) • I can explain that objects in Scratch have attributes (linked to) • I can recognise that commands in Scratch are represented as blocks
2. Programming sprites	In this lesson, learners will create movement for more than one sprite. In doing this, they will design and implement their code, and then will create code to replicate a given outcome. Finally, they will experiment with new motion blocks.	• To identify that commands have an outcome • I can identify that each sprite is controlled by the commands I choose • I can choose a word which describes an on-screen action for my plan • I can create a program following a design
3. Sequences	In this lesson, learners will be introduced to the concept of sequences by joining blocks of code together. They will also learn how event blocks can be used to start a project in a variety of different ways. In doing this, they will apply principles of design to plan and create a project.	• To explain that a program has a start • I can start a program in different ways • I can create a sequence of connected commands • I can explain that the objects in my project will respond exactly to the code
4. Ordering commands	This lesson explores sequences, and how they are implemented in a simple program. Learners have the opportunity to experiment with sequences where order is and is not important. They will create their own sequences from given designs.	• To recognise that a sequence of commands can have an order • I can explain what a sequence is • I can combine sound commands • I can order notes into a sequence
5. Looking good	This lesson develops learners' understanding of sequences by giving them the opportunity to combine motion and sounds in one sequence. They will also learn how to use costumes to change the appearance of a sprite, and backdrops to change the appearance of the stage. They will apply the skills in Activity 1 and 2 to design and create their own project, including sequences, sprites with costumes, and multiple backdrops.	• To change the appearance of my project • 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
6. Making an instrument	In this lesson, learners will create a musical instrument in Scratch. They will apply the concept of design to help develop programs and use programming blocks — which they have been introduced to throughout the unit. They will learn that code can be copied from one sprite to another, and that projects should be tested to see if they perform as expected.	• To create a project from a task description • I can identify and name the objects I will need for a project • I can relate a task description to a design • I can implement my algorithm as code

Carr Hill Community Primary School
Knowledge Organiser

Key Stage Two	Year 3	Computing	Events Actions and Programming

Key Knowledge

Overview

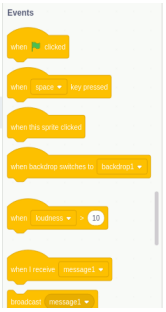
- Programming is when we make a set of instuctions for computers to follow
- Scratch is a program that we can use in order to code our own stories and animations. We can use an event and action command blocks in order to make sprites carry out acts when certain prompts take place
- We use algorithms (a set of instructions to perform a task) to sequence movements, actions and sounds in order to program effective animations

Scratch Blocks

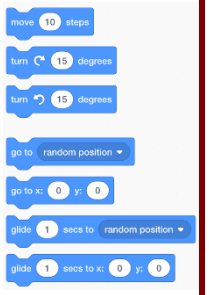
-Event Blocks: Event blocks are coloured yellow and are used to sense different events that happen, e.g. the green flag being clicked, when a key is pressed, or when a sprite is pressed. They are needed for every project.

-Action Blocks: Action blocks include 'Motion' blocks (coloured blue), 'Sound' blocks (pink) and 'Looks' blocks (purple). They make the sprite move, make sounds and change appearance when the event is triggered.

Events



Motion



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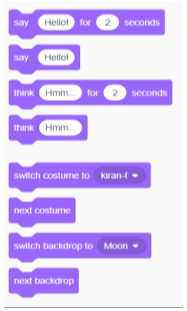

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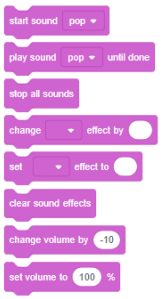


Key Vocabulary

Spelling	Definition/Sentence
Coding	Computer programmes are made using a special language called code. Coding is used so computers understand what to do.
Debug	Finding an issue in a programme and repairing it.
Input	Data that a computer receives.
Variables	Something that can be changed. They are used to store information that might change
Repetition	Looping or repeating sections of a computer program
Logical reasoning	Used to explain how simple algorithms work and to detect and correct errors in programs
Selection	How a computer executes a set of instructions depending on if certain conditions have been met or not.
Output	Data that a computer sends
Sequence	A series of events that must be performed in order to achieve a task.
Sprite	A sprite is a graphic that is designed to be part of a larger scene. It can either be a static image or an animated

The Basics of Scratch

-What is Scratch? Scratch is a website/ app that lets us code our own stories, games and animations.

-Scratch helps us to learn how to use programming language, whilst also being creative and using problem-solving skills.

There are three main areas in Scratch:

-The Blocks Palette (on the left) contain all of the different blocks: puzzle piece commands which control the animation.

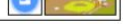
-Code Area (in the middle) is where the blocks are placed to create a program.

-Stage with Sprite (right) is where the output of the program is presented. The sprite is the character.

Adding/Removing Sprites: This can be done here, at the bottom of the stage. There are many sprites to choose from.

Attributes: There are three attributes of the sprite which we can change to make our animation: Code, Costumes, Sounds.

-Backdrops: Backdrops can be added by clicking on this icon (bottom right of the screen, below the stage).



Sequencing and Algorithms	Trialling and Debugging
-A **sequence** is a pattern or process in which one thing follows another. In Scratch, blocks can stack vertically on top of one another to create sequences. -Designing an **algorithm** (set of instructions for performing a task) will help you to program the sequence that you require. -**Programming** is when we move the blocks into the position (based on our algorithm design). Programming uses a code that the computer can understand.	-Programmers do not put their computer programs straight to work. They **trial** them first to find any errors: -Sequence errors: An instruction in the sequence is wrong or in the wrong place. -Keying errors: Typing in the wrong code. -Logical errors: Mistakes in plan/thinking. -If your algorithm does not work correctly the first time, remember to **debug** it.

Year 3 Events, Actions and Programming

This unit explores the links between events and actions, while consolidating prior learning relating to sequencing. Learners begin by moving a sprite in four directions (up, down, left, and right). They then explore movement within the context of a maze, using design to choose an appropriately sized sprite. This unit also introduces programming extensions, through the use of **Pen** blocks. Learners are given the opportunity to draw lines with sprites and change the size and colour of lines. The unit concludes with learners designing and coding their own maze-tracing program.

Lesson	Brief overview	Learning objectives
1 Moving a sprite	In this lesson, learners will investigate how characters can be moved using 'events'. They will analyse and improve an existing project, and then apply what they have learned to their own projects. They will then extend their learning to control multiple sprites in the same project.	• To explain how a sprite moves in an existing project • I can explain the relationship between an event and an action • I can choose which keys to use for actions and explain my choices • I can identify a way to improve a program
2 Maze movement	In this lesson, learners will program a sprite to move in four directions: up, down, left, and right. They will begin by choosing a sprite and sizing it to fit in with a given background. Learners will then create the code to move the sprite in one direction before duplicating and modifying it to move in all four directions. Finally, they will consider how their project could be extended to prove that their sprite has successfully navigated a maze.	• To create a program to move a sprite in four directions • I can choose a character for my project • I can choose a suitable size for a character in a maze • I can program movement
3 Drawing lines	This lesson will introduce learners to extension blocks in Scratch using the **Pen** extension. Learners will use the pen down block to draw lines, building on the movement they created for their sprite in Lesson 2. Learners will then decide how to set up their project every time it is run.	• To adapt a program to a new context • I can use a programming extension • I can consider the real world when making design choices • I can choose blocks to set up my program
4 Adding features	In this lesson, learners will be given the opportunity to use additional **Pen** blocks. They will predict the functions of new blocks and experiment with them, before designing features to add to their own projects. Finally, they will add these features to their projects and test their effectiveness.	• To develop my program by adding features • I can identify additional features (from a given set of blocks) • I can choose suitable keys to turn on additional features • I can build more sequences of commands to make my design work
5 Debugging movement	This lesson explores the process of debugging, specifically looking at how to identify and fix errors in a program. Learners will review an existing project against a given design and identify bugs within it. They will then correct the errors, gaining independence as they do so. Learners will also develop their projects by considering which new setup blocks to use.	• To identify and fix bugs in a program • I can test a program against a given design • I can match a piece of code to an outcome • I can modify a program using a design
6 Making a project	In this lesson, learners will design and create their own projects. Using a template (which can be blank or partially completed), learners will complete projects to move a sprite around a maze, with the option to leave a pen trail showing where the sprite has moved. Ideally, projects will include setup blocks to position the sprite at the start of the maze and clear any lines already on the screen.	• To design and create a maze-based challenge • I can make design choices and justify them • I can implement my design • I can evaluate my project