Carr Hill Community Primary School
Knowledge Organiser

Key Stage One	Year 5	Computing	Flat- File Databases

Key Knowledge

Overview

Data is raw numbers and figures**. Information** is what we can understand from analysing data.

There are lots of different ways we can collect, log, and interpret data, including using databases.

Databases organise data so that it can be easily added to, amended an accessed.

Computer databases can allow large amounts of data to be sorted, filtered, and edited more easily

Types of Databases

Database: A database is a collection of organised data that is easily stored and used. Databases often structure data in logical ways (e.g. in columns, rows and tables) so that it can be accessed by those who need it easily. Databases are made up of individuals records, which contain information in different fields (categories).

-Paper Databases: Paper databases require the creator to manually write in individual records, and to sort the records in an appropriate order. Paper records can still be useful in small databases, particularly where information is not changing and does not need to be amended frequently. However, most large databases are now stored on computers.

-Computer Databases: Many computer programs allow us to create databases, e.g. *j2data* or *Microsoft Excel.* Computer databases have become more popular than paper databases, as data can be easily and quickly added or removed, sorted, filtered, edited, or viewed at any time.

Key Vocabulary

Information	knowledge communicated or received concerning a particular fact or circumstance.
Database	a comprehensive collection of related data organized for convenient access, generally in a computer.
Search	to go or look through (a place, area, etc.) carefully in order to find something
Sort	to arrange according to sort, kind, or class; separate into sorts
Filter	to subject (data) to an algorithmic filter

Using a Computer Database

-Computer databases often contain large amounts of data. We can find the data that we need by using the 'search', 'filter' and 'sort' functions. Search functions allow us to type in the exact word/s that we are looking for. This can be useful if we are looking for a particular record.

-If we are looking for records that share certain information we can filter out data by different fields. For example, we filer in the 'age' field for all students aged 23. The database will then present only the students aged 23.

-We can also sort records by the data in particular fields. e.g. we may sort by the students' ages, from youngest to oldest. The youngest student will then appear at the top.

Presenting Data

Data can be shown visually , by using graphs and charts. This allows users to quickly find answers to their questions. It helps the user to easily see trends and to sequence information

Using databases

Remember that databases are used to find information quickly and easily. Databases are only able to do this if the data is organsied logically into clear records and fields. Data bases are used in many oragisatuons including, medical records, school student inforamtion , flight logs and business accounts

Carr Hill Community Primary School
Knowledge Organiser

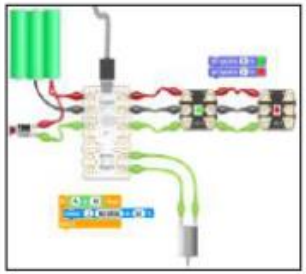
Key Stage One	Year 5	Computing	Selection in Physical Computing

Key Knowledge

Overview

Overview

Selection in Physical Computing



- Programming is when we make and input a set of instructions for computers to follow.

-Microcontrollers are devices that can be programmed to control output devices that are connected to them.

-We use algorithms which we can plan, model, trial and debug, in order to create accurate command sequences, involving multiple output devices (e.g. LEDs and motors).

Microcontrollers, LEDs and Motors

-**Microcontrollers:** A microcontroller is a small device that can be programmed to control devices that are connected to it.

-One brand of widely used microcontroller is called a Crumble controller, which can be used to control many things, e.g. LEDs and motors.

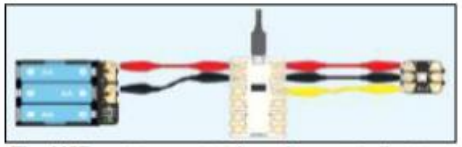
LEDs:

-LEDs are output devices that are emit light. When electricity is passed through an LED it produces light. One type of LED light, controlled by a Crumble controller, is called a Sparkle.

Motors:

-Motors are another output device. A motor can start, stop, spin forwards, spin backwards, and go at different speeds.

Creating Circuits:



-The USB port connects the microcontroller to a computer. Crocodile clips pass electricity and data through to the LED/motor.

-The + and - power pads on the Crumble should be connected with the + and - power pads on the Sparkle and battery box. The D pads on the Crumble and Sparkle should also be connected.

Key Vocabulary

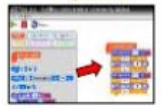
Data	
Circuit	a complete path through which an electric current can flow
Algorithm	a process or set of rules to be followed in calculations or other problem-solving operations, especially by a computer.
Debugging	the process of identifying and removing errors from computer hardware or software.
Sequence	a particular order in which related things follow each other.

Programming Commands

-For programming, we should use the microcontroller software.

-Crumble uses command blocks (like Scratch).

-**Adding/Removing Commands**: To add a command block, drag it from the menu towards the program. When the grey arrow appears, the command will snap into the program. To remove a command block, drag it away from the program and back to the menu.



-**Modifying Commands:** Clicking on the colour square in the command block allows us to change the Sparkle's colour. To change the time of commands, click on the value. Delete the current value and type in the new value. Press enter after completed.

-**Count Controlled Loops:** These allow us to put programs on a loop. Count Controlled Loops are found in the 'Control' options. Drag the desired program into the Count Controlled Loop command block. 'Do until' loops allow commands to happen until a condition is met.

Sequencing and Algorithms

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

-We design **algorithms** (sets of instructions for performing a task) to help us program sequences involving multiple output devices (e.g. LEDs and motors).

-**Programming** is the process of keying in the code recognized by the computer into the software (using your algorithm).

Trialling and Debugging

-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.

Carr Hill Community Primary School
Knowledge Organiser

Key Stage One	Year 5	Computing	Selection in Quizzes

Key Knowledge

Overview

Overview

Quizzes in Scratch

- Programming is when we make a set of instructions for computers to follow.

-Scratch is a program that we can use in order to code our own quizzes, stories, animations and games. We can input questions using the 'ask' command blocks. We can use selections and conditions in order to ensure that there are different outcomes depending upon a user's response.

-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 quizzes, 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.

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

-Event Blocks:

Event blocks are coloured yellow and are used to sense different events that happen e.g., the green flag being clicked.

-Action Blocks: Action blocks include 'Motion' blocks, 'Sound' blocks and 'Looks' blocks. They make the sprite move, make sounds and change appearance.

Key Vocabulary

Data	
Programming	A set of instructions for computers to follow
Algorithm	a process or set of rules to be followed in calculations or other problem-solving operations, especially by a computer.
Debugging	the process of identifying and removing errors from computer hardware or software.
Sequence	a particular order in which related things follow each other.

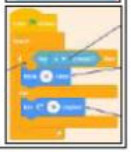
Selections and Conditions

-Creating Conditions: The 'If-then' command block helps us to create conditions. It is one of the darker orange control blocks. Other blocks are placed inside the 'If-then' blocks to create conditions.

The 'senses' blocks (light blue) create the 'trigger' (e.g. when a certain key is pressed). We can change the trigger by pressing the downward arrow and selecting from the range of keys/ actions. The 'actions' blocks (e.g. motions, sounds, etc). are then used to program what will happen when the 'senses' command is triggered.

-Different Outcomes: The 'If-then-else' command block helps us to write programs that have selections with two outcomes.

-Actions to be carried out if the condition is 'true' (if the conditions of the 'sense' command are met) are placed below 'then.' Actions to be carried out if the condition is 'false' (e.g. if any other key is pressed) go below 'else.'



-The 'forever' block means that the command will happen continually.

Asking Questions

-Questions can be included by using the 'ask' command blocks.

-If specific answers are needed (e.g. yes or no), these can be typed in when using the 'answer' sensing block within the = 'Operators' block - drag it into the first white space. In the second white space, we can then type in the desired answer.

-The 'say' command block (in looks) is used to inform the user if the response was correct.

Algorithms, Trialling, Debugging

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

-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.

Carr Hill Community Primary School
Knowledge Organiser

Key Stage One	Year 5	Computing	Vector Drawing

Key Knowledge

Overview

Overview

Vector Drawing

-Vector drawings are computer graphic images that are made using 2-D shapes.

-The drawings are connected by lines and curves to form polygons and other shapes, forming a complete picture.

-There are lots of different apps and programs that can help us to complete vector drawings, including Google Drawings and Adobe Illustrator.

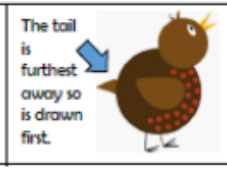
-Many techniques, e.g. zooming, rotating, resizing & duplicating, can help to create accurate images.

Creating Simple Vector Drawings

Vector drawings use lines and shapes to create bigger and more detailed images.

Plan your drawing by thinking about what shapes it is made up of. Each shape is called an object.

Circles



When vector drawing, the shapes overlap, so start with the objects that are the furthest away.

You can save a lot of time and effort doing the same thing over and over by duplicating shapes. This is done most easily by copying the object that you want to duplicate (hold ctrl + c) and pasting (hold ctrl + v) a new one.

You can enlarge/reduce an object by clicking on it and dragging the handles to the desired size.

You can rotate an object by dragging the circular handle at the top.

Key Vocabulary

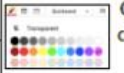
Data	
Vector	denoting a type of graphical representation using lines to construct the outlines of objects.
Rotate	move or cause to move in a circle round an axis or centre.
Layering	the action of arranging something in layers.
Alignment	arrangement in a straight line or in correct relative positions.

More Complex Vector Drawings

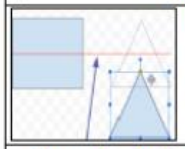
Google Drawings has been used in these examples, but lots of other vector drawing software uses the same tools and functions.

When dealing with small and intricate objects, it is important to use the zoom tool. Zooming in allows you to work with more precision. Zooming out allows a wider view.

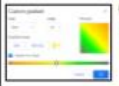
The line tools can be used to help you change the colour and weight (thickness) of the line, and to make dotted lines.



Coloured lines can be drawn, and colours can be used to fill shapes.

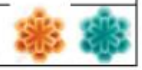


The Alignment guides pop up as you move objects around, and help you to align and size objects.



Gradient colours can be used to colour the same object in different colours.

Remember to that vector drawing is all about layering. By gradually adding layers of basic shapes, you build up something far more complex.



Advanced Tips

Grouping: 1. Select all images. 2. Right-click 3. Choose 'group.' All of the objects can now be moved and changed at the same time.

Advanced Layering: Right-click on objects and use the 'send to back' and 'bring to front' tools (in 'order') to ensure that your layering is in the correct order.

Backgrounds: You can create backgrounds by uploading images (using this icon). Remember to 'send to back' after it has been inserted.

Selecting Multiple Objects

This allows you to perform tasks with the whole drawing, rather than individual objects:

-Click, drag and drop a box around all of the objects in an image. This allows you to select all of the objects.

-When you perform an action (e.g. copy and paste) it will now apply to all.

Carr Hill Community Primary School
Knowledge Organiser

Key Stage One	Year 5	Computing	Video Editing

Key Knowledge

Overview

Overview

Video Editing

-You should already know that video means the recording, reproducing and broadcasting of visual images (often accompanied by audio).

-Video is made up of a sequence of images shown in quick succession, giving the impression of movement.

-Many different devices can be used to record, edit and playback video and sound.

-Theme, setting, characters, colour, sound, and dialogue are all important features of video.

Features of Videos

Videos present moving images, often accompanied by sound. The following features are commonly found in videos.

Plot means the main events in the video, shown in a sequence. Plot features are caused by and affect one another.

Themes are the main ideas that run through the video, e.g. love, friendship, magic, violence.

Most videos, even very short videos, try to give the audience a message. This may be obvious or hidden.

Props are the moveable objects that are used by the actors/ actresses in videos texts.

Dialogue is the name given for the conversations between people in video texts.

Characters are the different people and animals in a story, including in a video.

Key Vocabulary

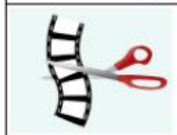
Data	
Video	the recording, reproducing, or broadcasting of moving visual images.
Audio	sound, especially when recorded, transmitted, or reproduced.
Zoom	change smoothly from a long shot to a close-up or vice versa.
Pan/tilt	move (a camera) in a vertical plane.

Editing Videos

Windows Movie Maker is one example of a video editing tool, but many others are available. Examples include WeVideo, Nero Video, and Apple iMovie.

In order to edit your video, you first need to import it from your device to the computer. You then need to import it into Movie Maker by clicking 'Add videos and photos.'

By right-clicking on the video thumbnail, you can choose to 'split' the video into pieces. The different pieces can be moved or deleted.



The trim tool allows you to move excess video from the beginning or the end.

A number of special effects are available, including using animations and transitions between shots. You can also add text in captions.

Remember to save your project regularly. You need to save your project as a *.wmv file so that you can continue to edit it.

Recording Videos

Static Camera: The camera is in a fixed position, sometimes using a stand or tripod. Examples of this in use are during news-reading and weather forecasts.

Zooming: Zooming in means to give a closer view of the subject. Zooming out gives us a further, broader view of the subject. Zooming too close can make the subject appear blurry.

Pan: The camera position is fixed, but moves from side to side.
Tilt: The camera position is fixed, but moves up and down.

Top Tips for Recording High-Quality Videos

-Use considered lighting.

-Think carefully about the sounds that you will use, e.g. music and sound effects.

-Think about the use of colour.

-Consider the use of a green screen for settings.