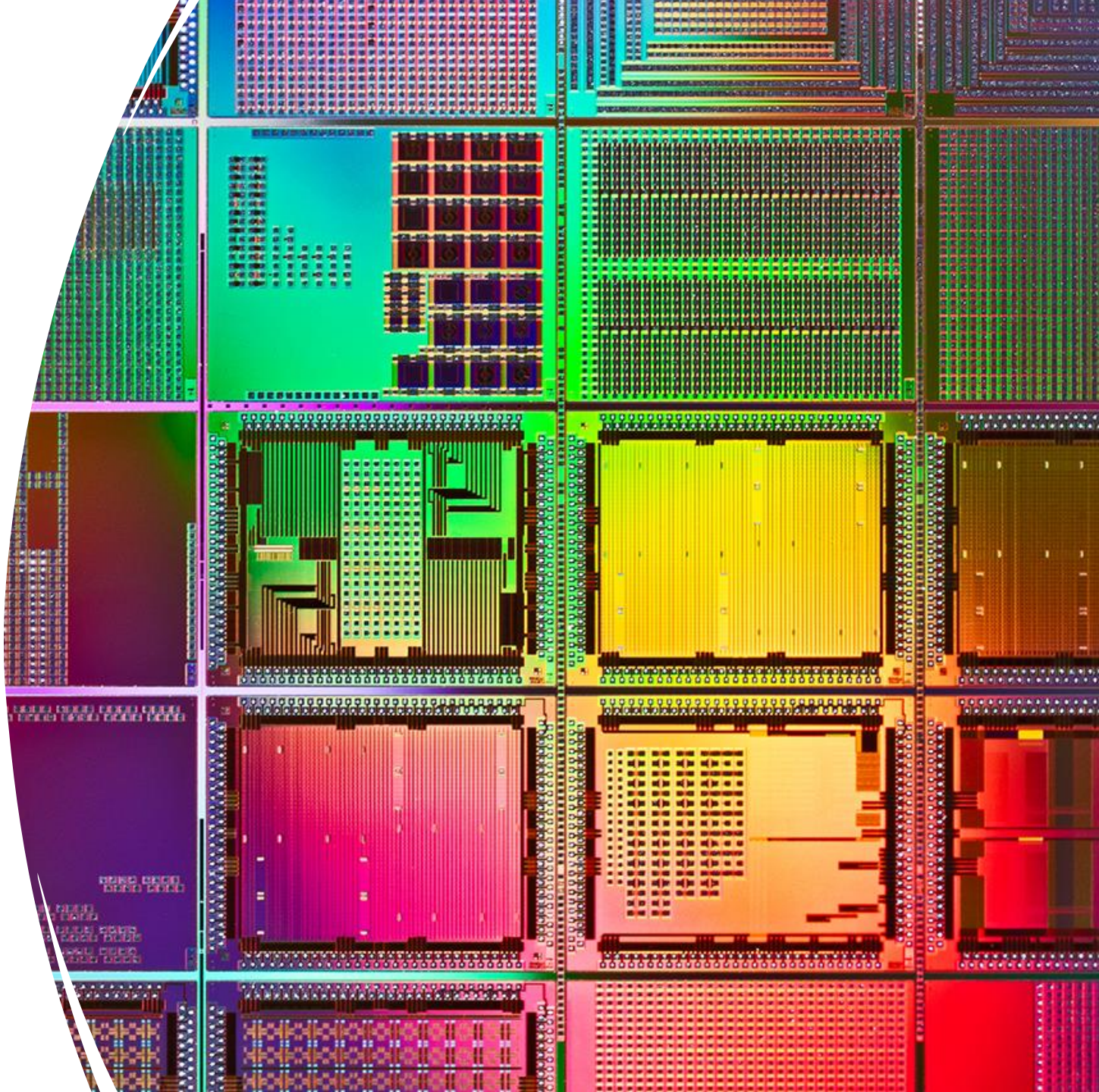
# Computing

Strathmore Infant & Nursery School



# Our vision & values

As members of the Strathmore family, our children will grow intellectually and emotionally in a supportive and stimulating environment.
We foster a lifelong love of learning that is attentive to our students' needs and interests.
Our well-rounded curriculum promotes critical thinking, perseverance, and health and wellbeing. They learn to value themselves, others and the world we live in.
Children are at the heart of our vision.

*Nurturing Brilliant, Resilient Minds*

**Be kind**

**Be safe**

**Be respectful**

# Subject intent – 10 big ideas


The curriculum at Strathmore is underpinned by 10 big ideas. In Computing, these are met in the following ways:

**Humankind**: looking at the cause and effect of human behaviour when it comes to online safety.

**Processes**: looking at electricity and how computers & other digital equipment work.

**Creativity**: looking at qualities such as persistence, determination, originality and resilience within computing, in particular, with exploring coding and algorithms.

**Nature**: using the internet to explore nature and other digital equipment such as cameras to take photographs of the world around us.

**Investigation**: exploring ways to create hypothesis, gather evidence and begin to evaluate data. This could be within Science or data handling in Maths also.

**Significance**: looking at significant individuals within our digital world and the impact they continue to have on information technology.

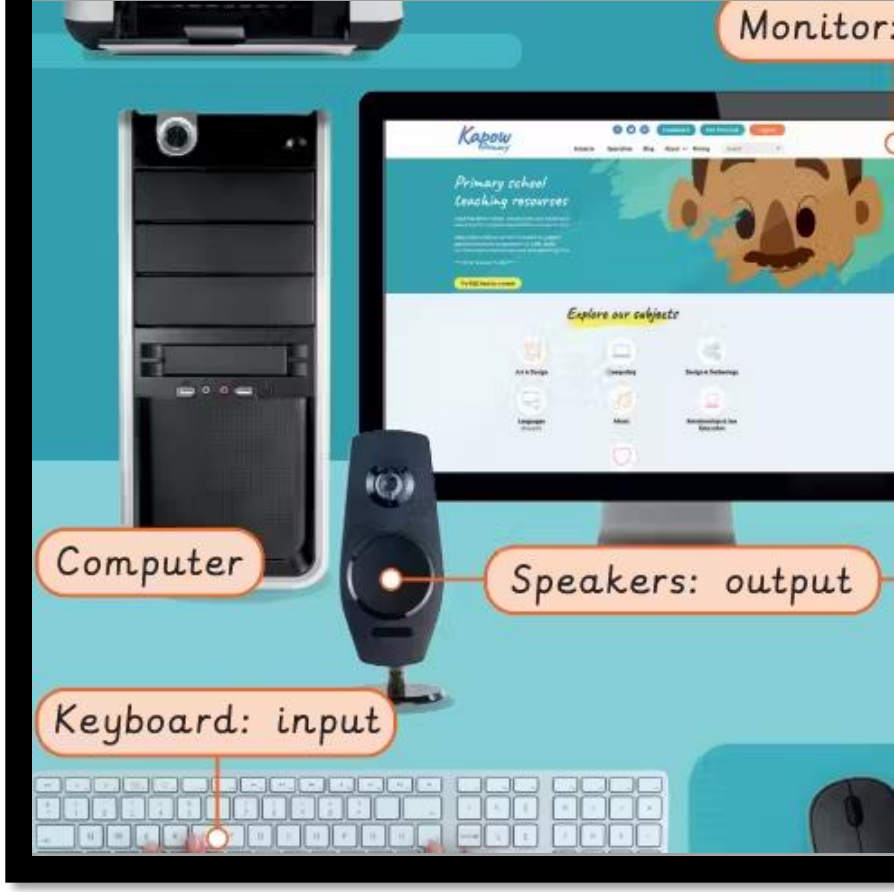
**Materials**: looking at various coding equipment and how it may be used for a purpose.

**Change**: understanding why and how information technology, digital literacy and computer science has changed over time.

**Place & Space**: using technology and maps to look at places, people and settings.

**Comparison**: comparing information technology and digital equipment now and in the past.

# Subject intent




At Strathmore, our Computing curriculum aims to instill a sense of enjoyment around using technology and to develop pupil's appreciation of its capabilities and the opportunities technology offers to create, manage, organise and collaborate. Through our curriculum, we intend for pupils not only to be digitally competent and have a range of transferable skills at a suitable level for the future workplace, but also to be responsible online citizens.

The scheme of work we use, Kapow, enables pupils to meet the end of Key Stage Attainment targets outlined in the National curriculum. There is a clear focus on progression within computer science, digital literacy and information technology. Pupils are explicitly taught vocabulary within Computing to help them further understand the curriculum ambitions.

# Subject implementation

Computing is mostly covered in KS1 by Kapow, covering a range of subjects across Computer Science, Digital Literacy and Information Technology.

The scheme for KS1 is currently being followed as it is planned through the Kapow Computing – Long term plan with online safety filtered throughout each term, with an additional Online Safety Week in the Spring term. At Strathmore we intend to focus on digital literacy during the Autumn and Spring terms and then move towards Kapow for the Summer term, learning about computer science.


Whilst the technology strand is no longer a specific area in the new EYFS framework (2021), children in Early Years develop computing skills through their specific curriculum to develop an interest and confidence in technology, giving them an advantage going into KS1.

# Subject implementation

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| EYFS<br><br>Strathmore EYFS Curriculum | Operating simple equipment:<br>Talk tiles , glow pads<br><br>Using IWB to interact with online games | Taking pictures of their models on the iPad/cameras<br><br>Using Bee-Bots | Using iPads to take photos and record video.<br>-Cd player<br>-Listening station | Using teacher laptop to use mouse and keyboard whilst navigating the IWB. | Looking at the range of technology we have at school and at home (and studying their uses). | Choosing technology to use for a specific purpose.<br>Typing using laptops and iPads<br>Using Beebots on maps |
| Year 1<br><br>Kapow Primary | Computing Systems and networks:<br>Improving mouse skills<br><br>+online safety lesson 1 | Programming 1:<br>Algorithms unplugged<br><br>+online safety lesson 2 | Skills showcase:<br>Rocket to the moon<br><br>+online safety lesson 3 | Programming 2:<br>Bee-Bots (option to use real Beebots or Virtual)<br><br>+online safety lesson 4 | Creating media:<br>Digital imagery: Google | Data Handling:<br>Introduction to data |
| Year 2<br><br>Kapow Primary | Computing systems and networks 1:<br>What is computing?<br>+online safety lesson 1 | Programming 1:<br>Algorithms and debugging<br>+online safety lesson 2 | Computing systems and networks 2: word processing<br>Option 1: Google<br>Option 2: Microsoft 365 | Programming 2: Scratch Jnr<br>+online safety lesson 3 | Creating Media:<br>Stop Motion<br>Option 3: Devices without cameras<br>+online safety lesson 4 | Data Handling:<br>International Space station<br>+online safety lesson 5 |

# More about Kapow's Scheme of work

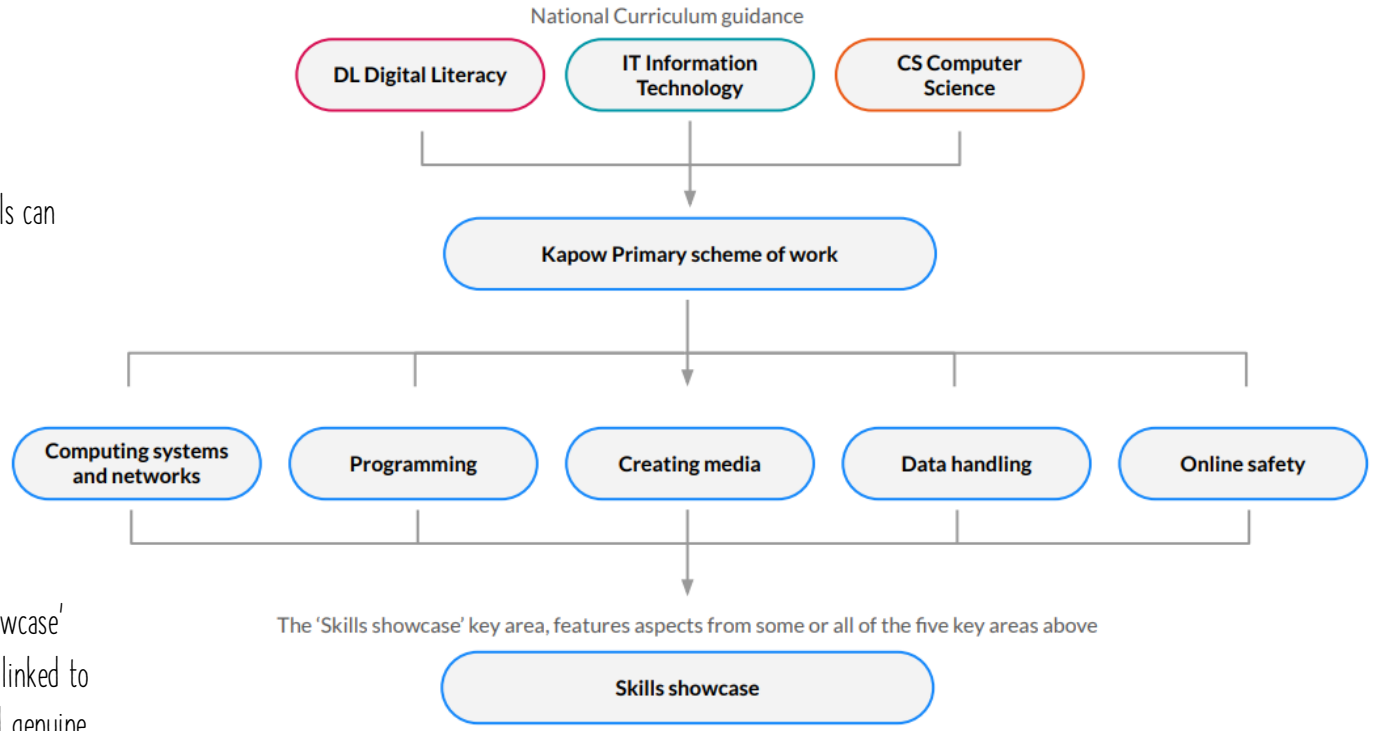
Kapow's scheme of work is designed with three strands which run throughout:

- Computer science
- Information technology
- Digital literacy

The Kapow Primary scheme is organised into five key areas, creating a cyclical route through which pupils can develop their computing knowledge and skills by revisiting and building on previous learning:

- Computer systems and networks
- Programming
- Creating media
- Data handling
- Online safety

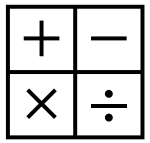
This ensures a broad and balanced coverage of the National Curriculum requirements, and the 'Skills showcase' units provide pupils with the opportunity to learn and apply transferable skills. Where possible, units are linked to other subjects such as science, art and music to enable the development of further transferable skills and genuine cross-curricular learning.



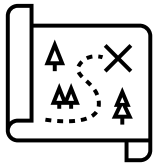
# Subject implementation

We teach Computing explicitly as a one hour weekly lesson to develop Computing skills. However, we will make links where appropriate. For example, opportunities are always taken to promote computing skills across subjects such as Mathematics, History, Geography and Science

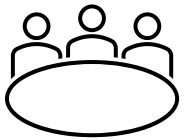
## Cross-curricular links



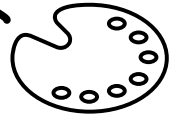
Mathematics
Data handling



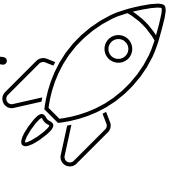
History/Geography
Map skills



PSHE
Online safety



Art & DT
Photography
Digital artwork



Science
Rocket to the Moon - space

# Key vocabulary

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| EYFS | Children in Early Years are exposed to Computing throughout the year through topic-based learning. An example of some of the vocabulary that children will be exposed to is:<br>On Off Switch Backwards Forward Instruction Sound Moving<br>Buttons Collect Command Computer Count Equipment Keyboard Keys Monitor Mouse Movement Organise Phone Camera Remote Set of photos Type<br>Choices Create Internet information Share Technology Website | | | | | |
| Year 1 | Log in, Login, Log out / off, Mouse, Mouse pointer, Click, Keyboard, Screen, Password, Account, Software, Duplicate, Ctrl, Tools Right click, Menu, Layers, Username, Drag, Drag and drop, Digital, photograph, Undo, Cursor | Debug, Decompose, Decomposition, Device, Directions, Input, Instructions, Manageable, Motion, Order, Organise, Output, Precise, Programming, Problem, Robot, Sensor, Sequence, Solution, Specific, Steps, Tasks | Annotate, Cells, Components, Create, Data, Debug, Designing, Digital content, Digital image, Document, E-document, Edit, Editing program, Evaluate, Folder, Input, Instructions, Log in, Photo, Program, Order, Robot, Save, Sequence, Share, Software, Spreadsheet, Table | Algorithm, Artificial intelligence, Bee-Bot, Clear, Code, Debug, Demonstration, Filming, Inputting, Instructions, Pause, Precise, Predict, Program, , Video, Video recording | Background, Blurred, Camera, Clear, Crop, Delete, Device, Digital camera, Download, Drag and drop, Edit, Editing software, Filter, Image, Import, Internet, Keyword, Online, Photograph, Resize, Save as, Screen, Search engine, Sequence, Software, Storage space, Visual effects | Bar chart, Block graph, Branching database, Categorise, Chart, Click and drag, Compare, Count, Data, Data collection, Data record, Data representation, Edit, Input, Keyboard, Line graph, Mouse, , information, Label, Pictogram, Pie chart, Process, Record, Resize, Sort, Table, Tally, Values |
| Year 2 | Battery, Buttons, Camera, Computer, Desktop, Device, Digital, Digital recorder, Electricity, Function, Input, Invention, Keyboard, Laptop, Monitor, Mouse, Output, Paying till, Scanner, Screen, System, Tablet, Technology, Video, Wires | Abstraction, Algorithm, Artificial intelligence, Bug, Clear, Correct, Data, Debug, Decompose, Error, Key features, Loop, Predict, Unnecessary | Backspace, Bold, Copy, Copyright, Cut, Delete, Forward button, Highlight, Home row, Home screen, Image, Import, Italics, Keyboard, Keyboard character, Keyboard shortcut, Keyword, Layout, Navigate, Paste, Redo, Search, Space bar, Text, Text effects, Touch typing, Underline, Undo | Algorithm, Animation, Blocks, Bug, Button, CGI, Computer code, Code, Debug, Fluid, Icon, Imitate, Instructions, Loop, 'On tap', Programming, Repeat, ScratchJR, Sequence, Sound recording | Animate, Animation, Animator, Background, Decompose, Digital camera, Duration, Flipbook, Focus, Frames, Import, Moving images, Object, Onion skinning, Plan, Save, Still images, Upload | Algorithm, Astronaut, Data, Digital, Digital content, Experiment, Galaxy, Insulation, Interactive map, International Space Centre, International Space Station, Interpret, Laboratory, Monitor, Planet, Satellite, Sensor, Space, Temperature, Thermometer, Water reservoir |

# Progression of knowledge & skills – EYFS

A document is available through Kapow showing the skills covered in each year group from EYFS onwards. It details which units focus on developing certain skills and gives three to five key knowledge statements for each unit. Although we do not use Kapow to teach Early Years, we use this document to inform long-term planning to support the children in preparation for developing these skills from Year 1 onwards.

Children learn...

- To be able to understand what a computer keyboard is and recognise some letters and numbers.
- To know that being able to follow and give simple instructions is important in computing.
- To know that different types of technology can be found at home and in school.
- To know that you can program a Bee-Bot with some simple commands.
- To know that sorting objects into various categories can help you locate information.
- To understand that it is important for instructions to be in the right order.
- To know that you can take simple photographs with a camera or iPad.
- To know that using yes/no questions to find an answer is known as a branching database.
- To know that to use a computer you need to log in to it and then log out at the end of your session.
- To understand why a set of instructions may have gone wrong.
- To know that you must hold the camera still and ensure the subject is in the shot to take a photo.
- To understand that an algorithm is a set of clear and precise instructions.
- To know that a pictogram is a way of showing information.

# Progression of knowledge & skills – Year 1

A document is available through Kapow showing the skills covered in each year group from EYFS onwards. It details which units focus on developing certain skills and gives three to five key knowledge statements for each unit. Although we do not use Kapow to teach Early Years, we use this document to inform long-term planning to support the children in preparation for developing these skills from Year 1 onwards.

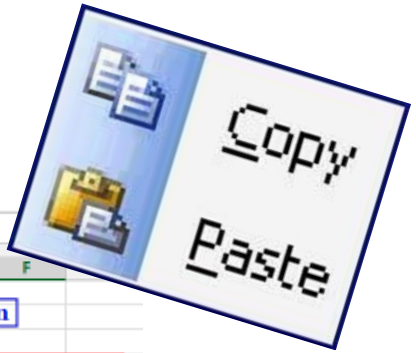
## Children learn...

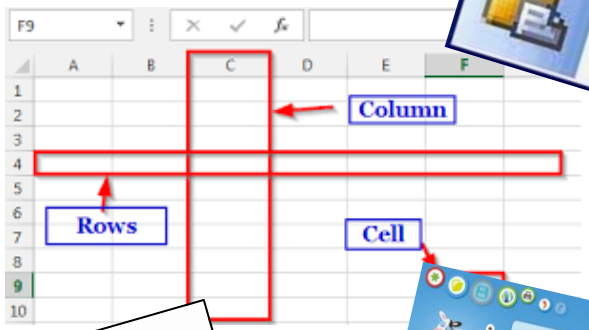
- To know that "log in and log out" means to begin and end a connection with a computer.
- To know that when we create something on a computer it can be more easily saved and shared than a paper version.
- To understand the basic functions of a Bee-Bot.
- To understand that holding the camera still and considering angles and light are important to take good pictures.
- To know how that charts and pictograms can be created using a computer. To know that the internet is many devices connected to one another.
- To know that a computer and mouse can be used to click, drag, fill and select and also add backgrounds, text, layers, shapes and clip art.
- To know that input devices get information into a computer and that output devices get information out of a computer.
- To know some of the simple graphic design features of a piece of online software.
- To know that you can use a camera/tablet to make simple videos.
- To know that you can edit, crop and filter photographs.
- To understand that a branching database is a way of classifying a group of objects.
- To know what to do if you feel unsafe or worried online – tell a trusted adult.
- To know that passwords are important for security.
- To understand that decomposition means breaking a problem into manageable chunks and that it is important in computing.
- To know that a spreadsheet is an electronic 'table' for sorting data.
- To know that algorithms move a Bee-Bot accurately to a chosen destination.
- To know how to search safely for images online.
- To know that computers understand different types of 'input'.
- To know that people you do not know on the internet (online) are strangers and are not always who they say they are.
- To know that we call errors in an algorithm 'bugs' and fixing these 'debugging'.
- To know that to stay safe online it is important to keep personal information safe.
- To know that 'sharing' online means giving something specific to someone else via the internet and 'posting' online means placing information on the internet.

# Progression of knowledge & skills – Year 2

Children learn...

- To know the difference between a desktop and laptop computer.
- To understand what machine learning is and how it enables computers to make predictions.
- To know that touch typing is the fastest way to type.
- To know that coding is writing in a special language so that the computer understands what to do.
- To understand that an animation is made up of a sequence of photographs.
- To understand that you can enter simple data into a spreadsheet.
- To understand the difference between online and offline.
- To know that people control technology.
- To know that loops in programming are where you set a certain instruction (or instructions) to be repeated multiple times.
- To know that I can make text a different style, size and colour.
- To understand that the character in ScratchJr is controlled by the programming blocks.
- To know that small changes in my frames will create a smoother looking animation.
- To understand what steps you need to take to create an algorithm.
- To understand what information I should not post online.
- To know some input devices that give a computer an instruction about what to do (output).
- To know that abstraction is the removing of unnecessary detail to help solve a problem.
- To know that "copy and paste" is a quick way of duplicating text.
- To know that you can write a program to create a musical instrument or tell a joke.
- To understand what software creates simple animations and some of its features e.g. onion skinning.
- To know what data to use to answer certain questions.
- To know what the techniques are for creating a strong password.
- To know that computers often work together.
- To know that computers can be used to monitor supplies.
- To know that you should ask permission from others before sharing about them online and that they have the right to say 'no.'
- To understand that not everything I see or read online is true.





# Exemplification of skill progression – Using software


## EYFS

- Using simple animation software (Chatterpix) to create a simple digital video.
- Taking photographs on an iPad.
- Using an IWB to draw, play interactive games and support learning.


## Year 1

- Using a basic range of tools within graphic editing software.
- Taking and editing photographs.
- Developing control of the mouse through ragging, clicking and resizing of images to create different effects.
- Developing understanding of different software tools.


## Year 2

- Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts.
- Using word processing software to type and reformat text.
- Using software (and unplugged means) to create story animations.
- Creating and labelling images.

# Progression of knowledge & retrieval opportunities

We use weekly Learning Objectives for each child to document their progress in Computing from Year 1, through to the end of Year 2. In Early Years, the children's Computing skills and knowledge is logged using Tapestry observations.

Embedding the use of technology into the teaching of all subjects allows us to make opportunities for the children to continue to work on their Computing skills. For example, they are invited to play interactive subject-linked games during their choosing times, or may be able to document some of their work using a form of technology, such as a talk tin or tablet.

# Supporting pupils with SEND or disadvantaged pupils

Differentiated guidance is available for each lesson to ensure all lessons can be accessed by all pupils and stretch pupils' learning when required. Some key changes we may make for pupils with SEND are:

Visual impairment - enabling accessibility features, changing resolution, considering colours, reduce glare.

Dyspraxia (fine or gross motor) - alternative devices if lacking in mouse control. We have large child keyboards in lower case to support all our pupils with key recognition. Enlarged cursor to aid tracking.

Cognition - concrete resources such as Beebots or tablets.

Memory processing - use of digital literacy equipment to record pupil's thoughts such as recordable microphones, clever tiles, talk buttons and recordable whiteboards.

Dyslexia - encourage all staff to change the colour of their backgrounds to off white. Use of speech to text equipment or using Clicker.

# Diversity within the curriculum

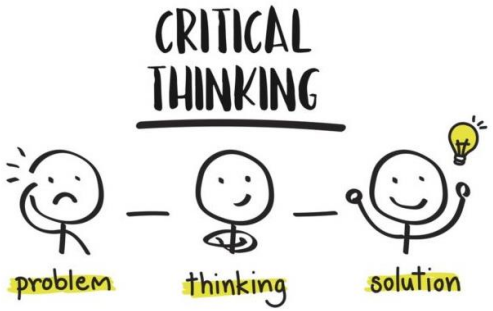
As a school, we are reviewing the diversity on offer throughout our curriculum.

In Computing, there is still room for more opportunities to promote diversity. Our identified next steps are:

- Identify and review a range of role models to support the diversity within the subject of Computing.
- Review the possible cross-curricular links that can be made.

# Subject impact

- The impact of the scheme can be constantly monitored through both formative and summative assessment.
- The expected impact following our scheme of work is that children will:
  - Be critical thinkers and able to understand how to make informed and appropriate digital choices in the future.
  - Understand the importance that computing will have going forward in both their educational and working life and in their social and personal futures.
  - Understand how to balance time spent on technology and time spent away from it in a healthy and appropriate manner.
  - Understand that technology helps to showcase their ideas and creativity. They will know that different types of software and hardware can help them achieve a broad variety of artistic and practical aims.
  - Show a clear progression of technical skills across all areas of the National curriculum - computer science, information technology and digital literacy.
  - Be able to use technology both individually and as part of a collaborative team.
  - Be aware of online safety issues and protocols and be able to deal with any problems in a responsible and appropriate manner.
  - Meet the end of key stage expectations outlined in the National curriculum for Computing.




# Assessment

Kapow provides a downloadable template of assessment criteria for its scheme of work for each lesson. The tool can be used to monitor the whole class easy at once against the criteria of WTS (working towards), EXS (secure understanding) and GDS (greater depth). Teachers will use this to track skill and knowledge progression in lessons, supporting those accordingly who made need adult modelling.

Here is an example of the assessment tool for one of the Year 1 units. Teachers can use the document to calculate the level of success criteria within their class. This can then be used to inform future planning for revisiting of topics.

| Kapow Primary | Computing assessment Year 1 | | | Homepage | Assessing Pupils' Understanding and Progress | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Strand** | **Unit** | **Lesson name** | **Lesson no.** | **Working towards/Learning intention (WT)** | **Secure understanding (SU)** | **Greater depth (GD)** | **Child 1** | **Child 2** | **Child 3** |
| **Computing systems and networks** | **Improving mouse skills** | Logging in | 1 | Logging into a computer and accessing a website. | The ability to explain how to log in to computers and use the mouse and keyboard. | Logging into computers using confident keyboard and mouse skills as well as explaining their predictions of the function of different tools. | | | |
| | | Click and drag | 2 | Using mouse skills to draw and manipulate shapes, dragging objects to change their size or position and moving shapes in front of behind one another. | Creating a piece of artwork which demonstrates clear control of the mouse using dragging and clicking to create different effects. Pupils are able to explain how to log in and log out of the local computer network. | Use of more advanced tools such as menus to duplicate or 'Snap' tools to make artwork more symmetrical. | | | |
| | | Drawing shapes | 3 | Using mouse skills to draw and manipulate shapes, dragging objects to change their size or position and moving shapes in front of behind one another. | Creating a piece of artwork which demonstrates clear control of the mouse using dragging and clicking to create different effects. The ability to explain how to log in and log out of the local computer network. | Accurately drawn shapes, lined up inside each other. Different styles and colours used effectively. Using layers to add extra detail to their artwork as well as logging in and out independently. | | | |
| | | Drawing a story | 4 | Using a range of tools to create desired effects, using drag and drop to resize and reposition objects and a variety of digital painting tools to create different effects. | Logging in and using a variety of different tools to draw a scene from a story. | Logging in independently and using advanced tools such as layers in order to make their artwork more effective. The ability to discuss different tools and how they used each one to alter their artwork. | | | |
| | | Self portrait | 5 | Identifying key features of an object and breaking it down into simple shapes. Then using click and drag to create and layer shapes to make an image; repositioning, resizing and changing the order of shapes. | Logging and out of computers unaided, creating a self-portrait that includes the key features of a face and using at least two different paint tools. | Supporting peers with logging in and out of computers, demonstrating easy use of the mouse to create art, using a variety of different paint tools to create different effects as well as recognising and including key features that help to identify whose face they have drawn | | | |

# Enrichment opportunities

Safer Internet Day

Safer Internet Day

Interactive assemblies

Access to board games, problem solving games in independent learning time

Outdoor learning



Masked reader

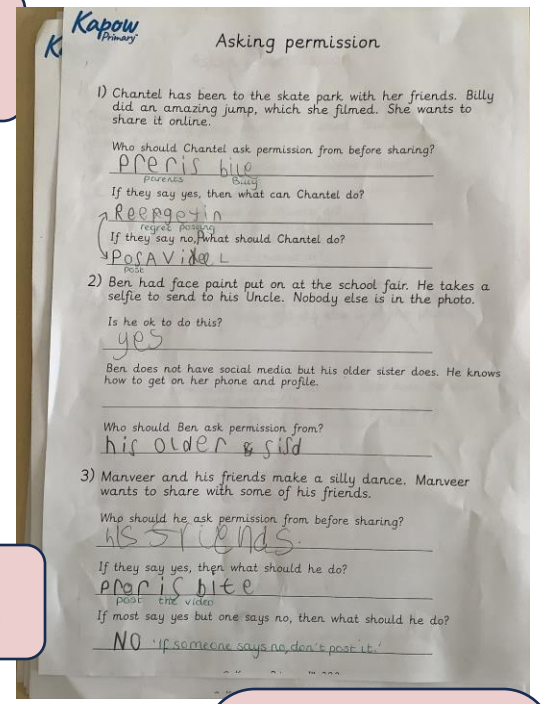
Using technology to enhance learning

# Our facilities & resources

- Talk tins/tiles
- Beebot robots
- Recordable parrot that repeats recordings.
- Recordable whiteboards
- Mini tablets
- Mark making LED tablets
- Interactive whiteboards
- Headphones
- Music players

# Safer Internet Day

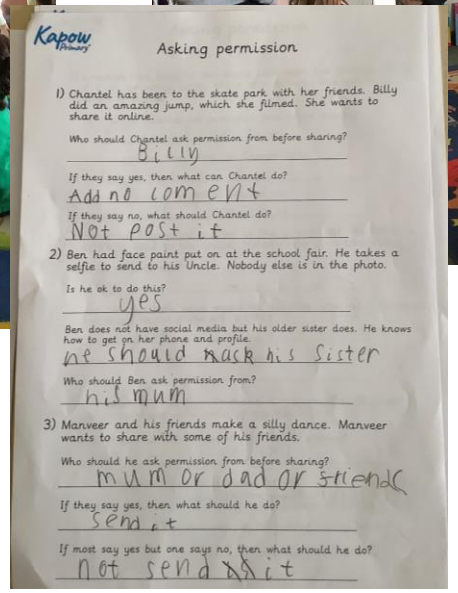
What happens if you press a button you don't know on your computer? Might see something you don't know. Then close computer down or tell an adult.




If someone is mean on the internet, what could you do? Stop playing the game

It's ok for some of us to message each other on Roblox because they know each other in real life

I asked an adult when I had something pop up.




You shouldn't speak to someone on the internet in case they come to your house and they might find you.

Sometimes people can be mean and cheeky on the internet.

What devices can you use the internet on?

- phone
- Tablet/iPad
- Nintendo switch
- Xbox

# Future opportunities

Moving forward with this subject, we are hoping to introduce:

- Individual folders for each child to journey with them through school - This will help to shows a clear progression in this subject, and ensure consistency in teaching practices.
- We will look to purchase more hardware: tablets with updateable features, cameras for photography.
- We will look to purchase more software: to support SEN learning further, as well as enhance learning in multi-sensory ways.
- More opportunities to celebrate Diversity in Computing through cross-curricular learning: Some significant people who are relevant to Computing and who we can include are:
    - Alan Turing
    - Steve Jobs
    - Al-Khwarizmi
    - Grace Hopper
    - Margaret Hamilton


My house is big


My house is detached. Dylan