Computing
Curriculum Map

Y6

In Y6, I develop my 3D design and printing skills as I learn to produce 3D models to set dimensions. I design, code and debug a range of mobile apps which respond to touch, light, motion and voice input using MIT App Inventor. I prepare the apps I make for download and test and debug these to ensure they achieve the task.
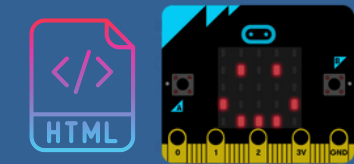
In Y5, I develop my 3D modelling skills, designing and printing a range of objects to fulfil a design brief. I develop my understanding of web development as I learn to use HTML and CSS code. I build upon my Scratch programming skills and begin to code using Python. I will learn the basics of physical computing as I begin to use begin to use handheld Micro:bits alongside sensors and circuit equipment and program them to solve problems.

Y5

Y4

I n Y4, will develop my coding and programming skills using Scratch to write and debug algorithms to accomplish a goal. I will program my own games and chatbots involving variables such as a score, timer and levels. I will learn to develop my own website safely and gain a deeper understanding of cloud computing using GSuite tools. I will begin to use Tinkercad to create and print 3D models.

Y3

In Y3, I will use block based coding programs such as Scratch and CoSpaces to program sprites on screen and Sphero robots. I will use sequence, selection and repetition in algoritms to accomplish given tasks. I will build and code interactive 3D Virtual environments and learn how the internet works.

SCRATCH

3D

Y2

In Y2, I learn to use the internet to communicate and collaborate safely. I'll create a range of documents and presentations using cloud collaboration. I'll learn to take 360 photographs and format these to show different interactive media conten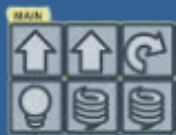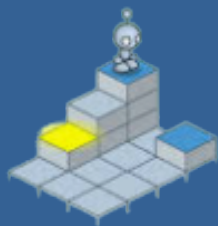t when viewed in Virtual Reality. I'll begin to use blocks of code on screen to program sprites and will begin to use 3D pens to create models.

360

Penguin

Y1

MAIN
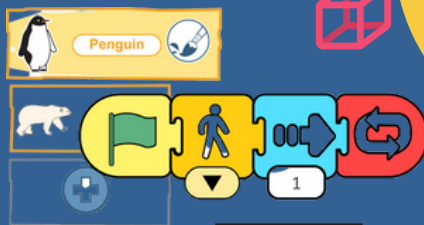
In Y1, I learn to create documents, presentations and ebooks using sound, images and text I find safely online or create myself. I create and debug simple algorithms involving commands such as forwards, backwards, turn, jump and go. I program using arrows pictorial commands on screen as well as using Beebots. I create simple stop–motion animations.

search

EYFS

In the EYFS I will learn to use technology to communicate and interact. Through play opportunities I will experience a range of resources that support my ICT knowledge and understanding as well as enhancing other key skills. I will learn to recognise that a range of technology is used in places such as homes and schools and I will select and use technology for particular purposes. I will use simple instructions to control a device and I will learn to complete a simple program on a computer.

Computing
Curriculum Map
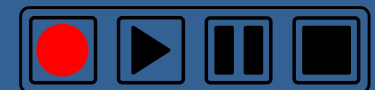
Reception

The 'Technology' strand has now been removed from the EYFS Framework and has not been replaced with any updated guidance. However, we believe computing and technology are still vitally important subjects to deliver to Reception children. Not only will teaching a well-planned technology curriculum ensure that children enter Year 1 with a strong foundation of knowledge, but these lessons in the EYFS also ensure that children develop listening skills, problem-solving abilities and thoughtful questioning — as well as improving subject skills across the seven areas of learning.

Autumn Term – Marvellous Me!

National Curriculum Coverage	What I learn	Progression Pathway
Explore a range of technological devices such as a microphone and camera. To use the IWB to draw a picture selecting colours and tools	This term, the children will learn a range of traditional songs and nursery rhymes and we will provide recording devices to allow children to record their own and other children's songs. They will learn to use the computers in the classroom and how to manipulate the interactive whiteboard, using the drawing tool and selecting colours and shapes. Through role play and exploration, children will explore a range of technological devices such as cameras, microphones and recordable speech bubbles.	In the EYFS pupils will learn how to use a range of technological toys and devices to support their learning. This might be learning how to take a photograph of their model with the camera or recording their singing with a microphone. In Year 1 pupils will progress to using technology purposefully to create, organise, store, manipulate and retrieve digital content.

Spring Term – Traditional Tales and adventures

National Curriculum Coverage	What I learn	Progression Pathway
Recognise that a range of technology is used in places such as homes and schools. Select and use technology for particular purposes including a programmable toy	During our minitopic on pirates, the children will learn to program the beebots and help them escape the pirate maze. They will direct their friends around the pirate island using a walkie-talkie. They will also learn about technology in the home and take part in a technology hunt in our school grounds.	In the EYFS pupils will be introduced to using simple instructions to control devices. This will be built upon in year 1 when they learn that devices can be controlled using algorithms.

Summer Term – Adventures around the World

National Curriculum Coverage	What I learn	Progression Pathway
To select and complete a simple educational game on a computer, demonstrating effective mouse skills. To use technology safely	This term the children will begin to access the ICT suite. This will enable them to learn how to use a computer effectively - logging on, using the mouse to select icons and accessing educational games. We will begin to learn about online safety in these lessons.	In the EYFS pupils will learn how to access games and activities using the computer and IWB. In Year 1, children will further learn how to access the internet and search for items. They progress from viewing images on screen in EYFS to finding, using and manipulating images.

Computing
Curriculum Map

Year One

Autumn Term 1 – Digital Images

National Curriculum Coverage

- Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

What I learn

In this unit, pupils are introduced to Google Search skills as they learn to search the web safely for digital images of toys through the ages. They learn to filter image search results to find different image types such as photo, clipart and GIF and to copy and paste the images they find into a document. Pupils learn to manipulate the images they find using skills such as resize, rotate, recolour and add frames and effects.

They take digital photos of toys in different still positions and animate using stop-motion to simulate movement.

Progression Pathway

This unit builds upon prior knowledge gained in EYFS in which pupils learn to use a keyboard to select letters and to click the mouse in order to select an image.

They build upon those skills this half term by using the keyboard and mouse to access the internet and type search terms. They progress from viewing images on screen in EYFS to finding, using and manipulating images.

This will lead on to creating interactive presentations in year 2 and creating their own 360 and VR digital images.

Autumn Term 2 – Programming Beebots

National Curriculum Coverage

- understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions

- create and debug simple programs

- use logical reasoning to predict the behaviour of simple programs

- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

What I learn

In this unit, pupils begin to understand that algorithms are a set of instructions which can be followed. They use positional and directional language as they use commands such as *forward*, *backwards*, *turn* to program each other and Beebot robots to move in certain ways, according to a given sequence. They notice when their algorithms are ambiguous, unclear or do not achieve the given purpose and debug these errors.
Online Safety – Showing the value of love and kindness online

Progression Pathway

This unit builds upon prior knowledge gained in EYFS in which pupils used simple instructions to control devices. They build upon those skills this half term by discovering that devices can be controlled using algorithms they create. They begin to use a wider range of instructions in the form of commands and to join these together in algorithms. They control devices to reach a set point and identify and remedy bugs in their programs.
This is a precursor to writing algorithms using simple block based coding which pupils will progress onto in year 2.

Computing
Curriculum Map

Year One

Spring Term 1 – Word processing and digital text

National Curriculum Coverage

- Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

- recognise common uses of information technology beyond school

- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

What I learn

In this unit, pupils create digital letters and postcards from the character of the Lighthouse Keeper to tell his family about his new coastal home. They develop typing and formatting skills such as using spaces, capital letters and common punctuation using the shift key. They make these look visually attractive changing fonts, text size, text colour and using word art, page boarders and page background colours. They include images of the Lighthouse Keeper's new home and format these to fit alongside text.
Online Safety – Considering how people use devices and the internet

Progression Pathway

This unit builds upon the digital literacy skills learnt in the Autumn term in which pupils learnt to type search terms using a keyboard.

They now learn to create letters and postcards using typed and formatted sentences.

These skills will be developed further in year 2 as pupils learn to creating multimedia presentations.

Spring Term 2 – Producing an E-Book

National Curriculum Coverage

- Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

- recognise common uses of information technology beyond school

- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

What I learn

In this unit, pupils create an ebook to inform others about arctic animals. They design a front cover and add pages. They use graphics programs to paint their own digital images to illustrate their books and search the internet for images to use. They add text to each page and begin to use animations and transitions as pages are turned.
Online Safety – Knowing what is meant by personal information

Progression Pathway

This unit builds upon digital literacy skills gained in previous year 1 units of work by giving pupils the opportunity to use text and images in a range of programs.

Whilst developing the skills of searching, copying, pasting, typing and formatting text and images, pupils progress further onto applying these skills within presentation programs and using animations and transitions to control when and how their text and images appear.

This will develop further in year 2 as pupils learn to creating multimedia presentations.

Year One

Summer Term 1 – Space Programming

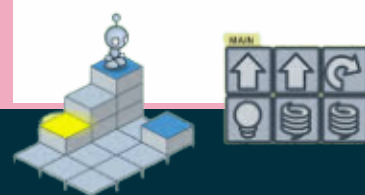| National Curriculum Coverage	What I learn	Progression Pathway
• understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions • create and debug simple programs • use logical reasoning to predict the behaviour of simple programs • use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies	In this unit, pupils program a rocket on screen to reach given places. They create algorithms using commands in both arrow form and text-based coding. They begin to use commands as simple blocks such as 'start' and 'walk' and join these together. They run their program to ensure it works and debug as necessary. Children produce an onscreen animation by joining different frames of a rocket travelling through space Online Safety - Consider how online gaming can be done safely	This unit builds upon previous year 1 beebot and rocket programming units as pupils progress from using commands in arrow form to beginning to recognise block-based and text-based coding. This is a precursor to writing algorithms using simple block based coding which pupils will progress onto in year2. The pupils' experience of animation broadens from stop-motion earlier in the year to frame animation in this unit.

Summer Term 2 – Programming Lightbot

National Curriculum Coverage	What I learn	Progression Pathway
• understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions • create and debug simple programs • use logical reasoning to predict the behaviour of simple programs • use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies	In this unit, children program an on screen robot to move around a course, lighting up coloured tiles. They use a range of pictorial commands such as 'jump' and 'light' in their algorithms and begin to use procedures to make algorithms more efficient. Online Safety - Understanding online bullying and its consequences	This unit builds upon the previous programming unit, taking the pupils from using simple commands such as 'forwards' and 'backwards' onto a wider range of commands. Pupils are asked to consider how efficient their algorithms are as they are challenged to keep them within a set number of steps. This is a precursor to writing algorithms using simple block based coding which pupils will progress onto in year 2.

Computing
Curriculum Map

Year Two
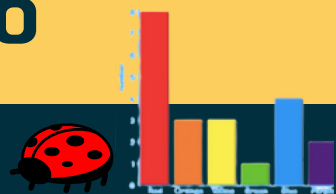
Autumn Term 1 – Minibeast data

National Curriculum Coverage

- Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

- recognise common uses of information technology beyond school

- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

What I learn

In this unit, pupils respond to a scientist's challenge asking them about the habitats and species found in their playground, producing a research document to inform him. They carry out a mini-beast hunt using digital tallying software and cameras to record what they find. They use Google Earth to geolocate where the minibeasts were found and produce charts and graphs showing the number of species found using digital graphing software. They make use of computer algorithms to sort and classify the minibeast found to further aid the scientist with his research.

Online Safety - Reviewing and updating online safety rules and the Acceptable Use Policy

Progression Pathway

This unit builds upon prior skills gained in year 1 in which pupils searched for images online and combined text and images in a presentation.

They extend these skills as they now include screenshots of bar charts, pictograms and piecharts they digitally create and insert photos they have taken and edited not just those found online. They produce screenshots of their location and use shape and arrow tools within their document to show where photos of minibeasts were taken.

This will lead on taking 360 photos and using a wider range of media in presentations in the summer term.

Autumn Term 2 – Civil rights presentations

National Curriculum Coverage

- Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

What I learn

In this unit, pupils use the internet to research a civil rights activist. They use digital mind-mapping software to record what they find out, adding images, video clips and links to other websites to show their research. They organise research questions and use their mind-map information to create a PowerPoint/ Google Slide presentation combining a range of media.

Online Safety - Know what is meant by online bullying and its consequences

Progression Pathway

This unit builds upon the search and presentation skills pupils learnt in Year 1 when they learnt to search for images and create a simple presentation using text and images.

In this unit they search for a range of media including video and text and embed video and hyperlinks in their presentations.

These skills will be further developed later in year 2 when pupils learn insert interactive 'hotspots' onto images which will bring up other media/ information when clicked by a user.

Spring Term 1 – Digital communication

National Curriculum Coverage

- Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

- recognise common uses of information technology beyond school

- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

What I learn

In this unit, pupils help Paddington to share his adventures in London with his family in Peru. They learn how the internet can connect people across the world and enable them to communicate. They consider the advantages and potential risks of communication such as video calls and social media and consider how photos can be shared safely. They take 360 photo sphere images of Paddington's new school using a digital camera and add interactive 'hotspots' to these which open up maps, websites and videos when clicked and view these through the use of VR headsets.

Online Safety – LI: To know how to communicate safely online

Progression Pathway

This unit builds upon the pupil's prior knowledge of online safety. They build upon their understanding of digital photography as the progress on to take photosphere images which can be viewed in 360. They build upon their understanding of using multimedia in presentations as they add clickable interactive links to their photos.

In the year 3 unit Building and Programming a VR Zoo, pupils will not only use VR to view and interactive with content but will begin to code VR experiences to react to the users movement.

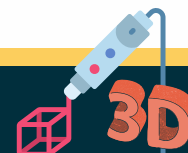## Spring Term 2 – Programming with Scratch Junior

National Curriculum Coverage

- understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions

- create and debug simple programs

- use logical reasoning to predict the behaviour of simple programs

- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

What I learn

In this unit, pupils begin to transition between pictorial and block based coding as they write algorithms to program sprites on screen. They create a range of programs in which sprites move in different ways, running 2 scripts at the same time. They begin to gain an understanding of sequence and loops, developing algorithms to create specific number shapes . They run their programs to test them and debug where their programs do not execute as expected.

Online Safety – Knowing that passwords keep information safe

Progression Pathway

This unit builds upon the simple arrow, button coding and programming skills the pupils developed in year 1 using Beebots.

They now begin to use a range of commands in simple, pictorial blocks. They begin to understand what a sprite and stage are and learn to change these a skill they revist in the year 3 unit Programming a Greek Myth Animation

This is a precursor to writing algorithms using block based coding in Scratch which is the focus in the next unit and in the year 4 unit, Making A Catch the Critter Video Game.

Computing
Curriculum Map

Year Two

Summer Term 1 – Coding and programming with Scratch

National Curriculum Coverage

- understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions

- create and debug simple programs

- use logical reasoning to predict the behaviour of simple programs

- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

What I learn

In this unit, pupils create a range of programs using Scratch. They write algorithms using clear instructions to cause sprites to move across the screen in different ways and carrying out different actions and also how to program repitition. They add sounds to their programs and begin to use loops and repetition with the programs they create.

Progression Pathway

This unit builds upon the simple arrow, button coding and programming skills the pupils developed in year 1 using Beebots and the simple pictorial block-based coding the pupils began to use earlier in year 2.

They now begin to use the Scratch programming language which they will use throughout KS2.

Summer Term 2 – 3D modelling with 3D pens

National Curriculum Coverage

- Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

- recognise common uses of information technology beyond school

- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

What I learn

In this unit, pupils begin to use 3D pens to create 3D leaf models. They use printed stencils and draw over collected leaf material to create 3D plastic leafs in different shapes, sizes and colours. They learn to change the plastic filament in order to create different colour butterflies and beetles and begin to use welding techniques to make wings or antenna protrude. They create larger 3D models by combing sections and use 3D pens to create bubble wands to blow bubbles in shapes such as cuboids before designing bubble wands on Tinkercad and printing these out using the 3D printer.
Online Safety – LI: To show the value of kindness online

Progression Pathway

This unit is a first introduction to 3D design and modelling.

This is a precursor to using Tinkercad software to design and print 3D printed models lintroduce in the Alpaca unit in year 4.

Computing
Curriculum Map

Year Three

Autumn Term 1 – Programming a Greek myth animation

National Curriculum Coverage

• design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

• use sequence, selection, and repetition in programs; work with variables and various forms of input and output

• use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

•use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

What I learn

In this unit, pupils use Scratch to program an animation of a Greek myth. They upload a sprite of Icarus and use movement blocks of code to make him fly up to the sun. They use code to make him appear smaller as he travels further into the distance and use repetition blocks to make it appear as though he is flapping his wings. They use conditionals to tell the code to make him announce that his wings are melting once he touches the sun and to plummet down into the sea below with a scream and a splash. They animate a conversation between Icarus and Daedalus, considering how 'wait' blocks can be used so that both characters do not speak at the same time.
Online Safety – Review and update online safety rules and the Acceptable Use Policy

Progression Pathway

In year 2 pupils were exposed to simple block based coding in which they made a character on screen move.
In this unit, they build upon this, uploading and creating their own sprites and stages, adding sounds and using a greater range of code blocks than simply motion. They begin to control the appearance of the characters they code and use control blocks to control when and how a sprite moves, speaks, plays a sound or appears on the screen.
This is developed in the Roman Gods unit later in the year when exposed to a greater range of coding blocks and commands

Autumn Term 2 – Programming Sphero Robots

National Curriculum Coverage

• design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

• use sequence, selection, and repetition in programs; work with variables and various forms of input and output

• use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

•use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

What I learn

In this unit, pupils use a block–based coding language on tablets to control small, sphere shaped robots. They send this code to the Spheros using bluetooth. They will drive the robots around a large space and through mazes and obstacle courses, using code to control its speed and direction. They will program the Spheros to roll into a 'target zone' on a dartboard and stop in a designated spot in order to score points, usingloops and conditionals. They will begin to code the LED lights of the Spheros to flash different colours at different points in their journey.
Online Safety – LI: To show the value of kindness online

Progression pathway

This unit builds upon the pupil's year 1 Beebot experience of controlling a physical object/bot and takes pupils further in their understanding of block based coding.
They begin to understand how Bluetooth can be used to connect physical systems. This unit builds pupils debugging and logical reasoning skills as they run their programs on the robot and see whether their code does what they wanted it to.

Pupils will build upon this next half term as they begin to code the Spheros to respond to sensors.

Computing
Curriculum Map

Year Three

Spring Term 1 – Robotics and Networks

National Curriculum Coverage

• understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration

• use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content

 design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

What I learn

In this unit, pupils continue to code Spheros and send their program to the robots using Bluetooth. They create programs in which the Sphero balls roll in a rectangle and lay measuring strips out on the roll so that the perimeter can be calculated as they roll. They control the robots to respond to motion, making a 'timebomb' catch game in which the ball counts down as it is thrown and flashes red when time is up and turn them into 'Magic 8 ball' fortune tellers. They learn how Bluetooth, wifi and cables connect computers and devices together and local, wide and global networks. Online Safety – Explore whether a website is trustworthy

Progression pathway

in this unit pupils build upon their robotic programming skills as they begin to program using sensors such as a motion sensor and refine their understanding of how code can make the robots respond to different forms of input and gain a deeper understanding of how devices and networks communicate.
Pupils will build upon this
 when they code VR headsets in the Virtual Reality Zoo unit and in the year 5 unit Micro:Bits when they program other physical devices

Spring Term 2 – Roman Gods animation

National Curriculum Coverage

• design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

• use sequence, selection, and repetition in programs; work with variables and various forms of input and output

• use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

• use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content

What I learn

In this unit, pupils use Scratch to program a Roman God animation in which different Roman gods appear on screen and introduce who they are and what they are God of, programming sprites to change costumes and speak. They will add a start screen to begin the running of the code e.g. 'Click here to learn about the Roman Gods and Godesses' and an end screen to appear once all the Gods have spoken. They will add Roman background music to play throughout and a sound effect to play each time a new God appears. They will run their code at regular intervals to test and debug as necessary.
Online Safety – Evaluate digital sources and content

Progression pathway

This unit builds upon the block based programming skills the pupils acquired using Scratch in the unit Programming a Greek Animation. In this unit they develop their skills to use broadcasts, so the sprite only carries out actions in response to a signal.

They will build on this further next half term when they are exposed to a greater range of coding blocks and commands which can be used in a program.

Computing
Curriculum Map

Year Three

Summer Term 1 – Programming Cleopatra's cloth

National Curriculum Coverage

• design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

• use sequence, selection, and repetition in programs; work with variables and various forms of input and output

• use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

·use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

What I learn

In this unit, pupils use Scratch code to create repeated pattern designs for Cleopatra's cloth. They begin by using the pen and drawing command blocks to create algorithms which will produce simple 2D shapes on screen such as squares, triangles and hexagons. Using nested loops to create shape patterns They then begin to repeat this code so that the shape is repeated slightly further away each time, realising that they can use repeat blocks to do this. Using motion blocks, they program the shapes to be repeated at slight angles to each other so that they can produce spiraling patterns to be used on Cleopatra's fabric and learn to program the shapes to be drawn in different colours and sizes to make their designs unique.
Online Safety – Consider how an online friend should and should not behave

Progression pathway

In earlier year 3 units, pupils have learnt to make sprites move in Scratch and have begun to use repetition blocks.
In this unit they learn to use the drawing commands to control a pen, developing understanding of repeat blocks, learning why and how these are used to make code more efficient and learn that these can be nested inside each other to make a program repeat more than one thing in sequence.
This will be built upon in the Catch a Critter Video Game unit in year 4 when the pupils are introduced to the use of selection and variables in programs.

Summer Term 2 – Building and programming a VR zoo

National Curriculum Coverage

• select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
• design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

• use sequence, selection, and repetition in programs; work with variables and various forms of input and output

• use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

What I learn

In this unit, pupils use the graphic modelling software CoSpaces to design and build a 3D virtual zoo (similar to Minecraft). They place animals in the zoo and animate them to move and make sounds. They view their zoo virtually through the VR headsets, walking around it before using block based coding to program the animals to interact with the wearer of the headset e.g. to roar when you walk past the lions or for the elephants to squirt water when the headset wearer reaches out to touch them.

Progression pathway

Pupils have previously created physical 3D models using 3D pens in year 2. This unit introduces pupils to 3D modelling on screen which will be a precursor for the CAD 3D design and printing they will begin in year 4.
In this unit they learn that an on screen visual representation of a 3D object can be transferred from the screen and viewed in 3D.
Building on the learning they began with Sphero robots – learning programs can communicate with physical devices and can respond to a range of input using sensors.

Computing
Curriculum Map

Year Four

Autumn Term 1 – Alpaca databases and spreadsheets

National Curriculum Coverage

- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

- ·use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

What I learn

In this unit, pupils use databases and spreadsheets to organise and plan the feeding, care and exercise needs of keeping a larger number of alpacas. They use formula to calculate how much food each alpaca needs based on its size and weight and write formula to calculate the daily, weekly and monthly costs involved in keeping them.; using SUM to calculate totals. They design and use a spreadsheet to calculate and manage potential income which could come from selling alpaca experience days and birthday parties and use formula to determine whether the profit would outweigh the cost of keeping them.
Online Safety – LI: To review and update online safety rules and the Acceptable Use Policy

Progression pathway

In the year 2 unit Civil Rights Presenations pupils learnt to create text and image based documents. This unit builds on the pupils digital literacy skills, introducing them to databases and spreadsheets. They learn to use and write formula for the first time.

At the end of year 4, they learn to create other types of digital information such as webpages.

Autumn Term 2 – Making a 3D alpaca / Digital music

National Curriculum Coverage

- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

- ·use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

What I learn

In this unit, pupils use Tinkercad software to create a 3D design of alpaca with moving legs. This will be printed using the 3D printer.
They will also use Audacity software to create digital music. They will import mp3 tracks and learn to mix and sequence sounds to create a new composition. They will these using a range of editing tools such as fade in and fade out and edit them further by changing the volume, pitch, tempo and using a range of effects such as echo.
Online Safety – Consider the issue of peer pressure

Progression pathway

This unit builds on the pupils' 3D modelling skills. In year 2, pupils learnt to create 3D plastic models using 3D pens in the 3D modelling unit .

In this unit they are introduced to Tinkercad software to design a model to be 3D printed. This is an introduction to Tinkercad which the pupils will use in the Make a Chess Set units in years 4 and 5, building upon their knowledge.

Computing
Curriculum Map

Year Four

Spring Term 1 – Making a Catch the Critter video game

National Curriculum Coverage

- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

- use sequence, selection, and repetition in programs; work with variables and various forms of input and output

- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

What I learn

In this unit, pupils create a 'catch the critter' game creating a algorithm using Scratch. They program insect sprites to randomly pop up in different places on the screen for the user to click before they disappear again. They will add a score which will increase each time an insect sprite is clicked and decrease each time a different, incorrect insect is clicked, using variables and levelling. They will add a timer so that the player has a set amount of time until a 'game over' screen appears. They will create levels of increasing difficultly and program these to begin once a set amount of points have been scored. They will use their choice of graphics and animate the game by using different costumes

Progression pathway

This unit builds on the pupils' existing block based coding skills, for example in the year 3 unit Cleopatra's Cloth. Previously, they have learnt to code sprites using a range of code blocks.

In this unit, they extend this by including variables within their programs such as a score and timer.

This will be built on further in the year 5 units Programming a Maths Game and Programming Painting software when they learn to use sliding variables and further conditionals.
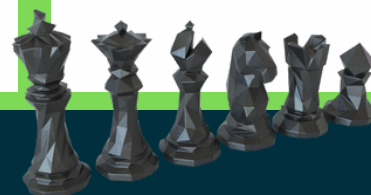
Spring Term 2 – 3D printed chess set

National Curriculum Coverage

- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

- ·use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

What I learn

In this unit, pupils use Tinkercad to create 3D models; building different chess pieces including a pawn, rook, king, queen, bishop and knight, aligning £D shapes and building in layers – grouping solid and hole shapes from the program. These designs are then printed on the 3D printer and used alongside chessboards for a friendly chess match in class. I

Progression pathway

This unit builds on the pupils' digital literacy skills. They have created a range of digital publications and presentations previously and have the skills of combing text and images.
Here, they build a webpage to communicate. They progress their skills as they learn how to insert hyperlinks and embed media within their presentations.
Later, when the pupils reach year 5, they will learn how to build websites using HTML and CSS code rather than simply adding content to a prebuilt frame.

Summer Term 1 – Website making

National Curriculum Coverage

- Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content

- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
- Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

What I learn

In this unit, pupils use Google Sites to create a webpage informing others about online safety. They create a website menu and link different pages from it. They create their pages, communicating tips and advice about how to stay safe online, using a range of media including clickable links, embedded videos, text and images. They publish their website and view it via the URL address they have created as well as searching for it within Google and evaluating how and where it appears.
Online Safety – Consider the impact which vloggers and social influencers have on our opinions

Progression pathway

This unit builds on the pupils' digital literacy skills. They have created a range of digital publications and presentations previously and have the skills of combing text and images.
Here, they build a webpage to communicate. They progress their skills as they learn how to insert hyperlinks and embed media within their presentations.
Later, when the pupils reach year 5, they will learn how to build websites using HTML and CSS code rather than simply adding content to a prebuilt frame.
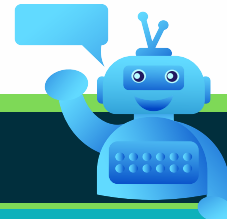
Summer Term 2 – Coding a chat bot

National Curriculum Coverage

- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

- use sequence, selection, and repetition in programs; work with variables and various forms of input and output

- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

What I learn

In this unit, pupils use Scratch coding language to create an AI assistant able to simulate human conversation. Similarly to the technology used to create household smart speakers (such as Alexa) and that which enables virtual customer service 'live chat' systems, pupils will use the coding skills of conditionals and selection to program software which responds appropriately to a user's input. Pupils will consider input and output as they program the chatbot to ask questions (e.g. how are you today?) and to select from a choice of answers (e.g. 'That's great to hear!' or 'Oh no, what's wrong?') based on the response given. They will consider which input the program should store (e.g. the user's name) so that it can use this frequently within the spoken output it gives. They will extend the software further by programming the bot to change its facial expressions and carry out certain gestures (such as cheering or clapping) based on the responses received. Using broadcasts, pupils will program the bot to change its appearance, location etc based on the input given (e.g. by asking 'Would you like to see my new hat?' or 'Would you like to visit the beach with me?' and changing if the response is positive).
Online Safety – Consider how communication and collaboration can take place safely online

Progression pathway

In the Spring term of Y4, pupils developed coding skills with a focus on variables.

This unit builds further upon this as they consider typed text and voice as different forms of input and output. Much more consideration of input is required as pupils logical reasoning and debugging skills are challenged deeper than in previous units.

This will be built on further in the year 5 units Programming a Maths Game where they will consider further conditionals and different types of response to answers given by a user.

Computing
Curriculum Map

Year Five

Autumn Term 1 – Designing a 3D Victorian house

National Curriculum Coverage

- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

- ·use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

What I learn

In this unit, pupils use Sketch Up 3D modelling software to create a virtual Victorian house. They begin by creating the walls, doorways, rooms and a peaked roof before filling the house with Victorian furniture. They search for 2D images of William Morris wallpaper and framed Victorian art prints online and import these in to hang from the walls. They explore the potential issues the 3D printer might face when printing their house and adapt the house into a more solid shape in order to print it into a 3D plastic model. Online Safety – Review and update online safety rules and the Acceptable Use Policy .

Progression pathway

This unit builds on the pupils' 3D modelling skills, from unitsin year 3 and 4. They were introduced to Tinkercad software and began to follow a given design and measurements to replicate a model.

This half term, they become more independent in their 3D design as they work without measurements to create their own individual design.

They begin to move towards thinking about the printing process as well as design and begin to understand how the 3D printer works in more detail. This will be developed further inthe Tinkercad unit in year 6

Autumn Term 2 – Programming a maths quiz game

National Curriculum Coverage

- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

- use sequence, selection, and repetition in programs; work with variables and various forms of input and output

- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.
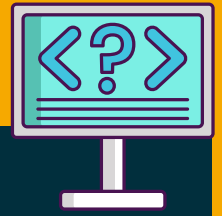
What I learn

In this unit, pupils code and program their own maths quiz game in which times table questions appear on screen for the user to answer. They use conditionals (if...then...else) to program the sprite to pick an appropriate response (such as 'well done' or 'oh dear, try again') based on the answer the player types in. They code the sprite to give visual feedback to the player such as smiling, jumping for joy or drawing a tick if their answer is correct. Pupils use variables to create a timer and a score and broadcast motivational messages to the player based on their score.
Online Safety – Reflect on the role of bystander and upstander in the context of online bullying

Progression pathway

In the year 4 Catch a Critter unit, pupils began using variables such as a timer and a score in the games they created.

In this unit they build further upon those skills, programming a sprite to respond to input given by a user with different forms of output.

This will prepare the children for exploring input and output further in year 6.

Computing
Curriculum Map

Year Five

Spring Term 1 – HTML and CSS code

National Curriculum Coverage

- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

- use sequence, selection, and repetition in programs; work with variables and various forms of input and output

- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

What I learn

In this unit, pupils create webpages and web-documents using HTML code. They look at the code behind existing websites and begin to identify the conventions for using HTML code, finding common HTML tags. They create headings, boxes, columns to insert content into before learning how to use HTML code to create paragraphs of text. They format their web-content using HTML and CSS code e.g. by changing the style or create bullet points, scrolling text and page boarders. They explore how images and backgrounds can be created using HTML and CSS.
Online Safety – Consider how social media can affect the way we think

Progression pathway

This is the first time pupils will have encountered HTML and CSS code within the curriculum.

In the Website Making unit n Y4, they designed websites by adding text and images onto a prebuilt frame.

In this unit, they learn that the frames of websites are set up using a coding language called HTML. This will be further developed in website computing in KS3

Spring Term 2 – 3D printed chess set (2021-22 only)

National Curriculum Coverage

- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

- ·use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

What I learn

In this unit, pupils use Tinkercad to create 3D models; building different chess pieces including a pawn, rook, king, queen, bishop and knight, aligning £D shapes and building in layers – grouping solid and hole shapes from the program. These designs are then printed on the 3D printer and used alongside chessboards for a friendly chess match in class. I

Progression pathway

As Tinkercad has been newly introduced, this unit will be taught from year 4 – 6 in 2021-22 to ensure all upper KS2 can participate and gain the necessary initial skills of working with the 3D design software.

From 2022-23, this will remain in the year 4 curriculum and be replaced for years 5-6.

Computing
Curriculum Map

Year Five

Summer Term 1 – Programming painting software

National Curriculum Coverage

- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

- use sequence, selection, and repetition in programs; work with variables and various forms of input and output

- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

What I learn

In this unit, pupils program a sprite to draw and create their own painting and drawing software similar to Microsoft Paint. They code 'colour picker' squares for the user to choose which colour they want to use and use broadcasts to make the pencil change its colour and the colour of the ink when a different colour is selected, using a change pen colour to create a rainbow effect. They create 'clear all' and rubber buttons and use a slider to enable the drawer to choose the thickness of their pen/rubber.
Online Safety - Know what digital footprints are and how they might affect someone in the future

Progression pathway

Pupils were first introduced to graphics programs in the year 1 unit, Creating an e book. This unit now gives them the opportunity to discover how such software works and is created.

They extend their Scratch programming skills by exploring variables further, this time using a slider. These progamming skills are developed further in th next unit when they link block and text coding

Summer Term 2 – Micro:bits

National Curriculum Coverage

- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- Use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

What I learn

In this unit, pupils program pocket-sized computers called Micro:bits as they begin to see how software and hardware work together. They program them on screen to display images using LED lights and then download the program onto them. They then learn how to code the LED lights to display numbers and program them to count up and down in 1 second intervals like a stop watch. They connect press-able buttons to create a matching game and use circuit equipment to program the Micro:bit to flash and buzz when metal touches in a steady hand game they make. They build robots out of cardboard, physically connect the Micro:bit using circuit equipment and program the sensors on the Micro:bit to cause the robot to carry out actions.

Progression pathway

Pupils have experienced using sequence, selection and repetition in block-based coding languages such as Scatch in many previous units.

This unit not only introduces them to physical computing with hardware and software but also shows them the link between block and text-based coding.

They will extend their understanding of hardware and software in year 6 starting with the unit, Button Apps, as they create programs which will be executed on tablet devices.

Year Six

Autumn Term 1 – Button apps

National Curriculum Coverage

- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

- use sequence, selection, and repetition in programs; work with variables and various forms of input and output

- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

What I learn

In this unit, pupils become familiar with MIT App Inventor software. They use this to create an app with a button which will speak when pressed and include a motion sensor so that it will speak when the tablet device is picked up or shaken. They take this further by developing an app to teach preschool children their animal sounds. They add a range of animal picture buttons which, once pressed will play the sound that animal makes. Pupils send these apps to tablet devices and take them along to the nursery to test them out.
Online Safety – Review and update online safety rules and the Acceptable Use Policy

Progression pathway

This unit builds upon the coding and programming skills pupils have developed so far using Scratch. They now transfer this to a new, similar, programming language.

This unit enables them to become familiar with the new software and learn the basics of app making, starting with a simple button.

As the year progresses, they build on their understanding of the app making software, making more sophisticated and visually appealing apps.

Autumn Term 2 – Random choice apps

National Curriculum Coverage

- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

- use sequence, selection, and repetition in programs; work with variables and various forms of input and output

- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

What I learn

In this unit, pupils design and create two apps which pick an item at random from a list, display it on the screen and read out the answer. They start with a dice app for maths week which will roll the dice when the tablet is shaken and announce the number it lands on. They then create a Magic 8 Ball app to make everyday decisions easier. Simply ask your question, shake the tablet and reveal your future. Pupils learn how to create a list of possible answers for the app to choose from and then use blocks of code to program the app to pick one at random.
Online Safety – Consider my digital footprint

Progression pathway

This unit continues to build on the pupils understanding of the Scrath program, developing last half terms use of button apps with pupils beginning to use selection within their Scratch programs.

In this unit they progress to understanding random item lists and how to use them. This takes the idea of selection further.

As the year progresses, they build on their understanding of the app making software, making more sophisticated and visually appealing apps.

Year Six

Spring Term 1 – Story ideas generator app

National Curriculum Coverage

- Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

What I learn

In this unit, pupils create an app to help support young writers who are stuck for ideas. They include buttons such as 'main character', 'setting', 'problem' and 'magical item' which spin when pressed and pick one at random. Combining multiple buttons, using lists in an app and a program in which the app picks at random. They think carefully about the interface of the app and how to make the design element visually appealing.
Online Safety – Consider my digital footprint

Progression pathway

This unit builds upon the skills pupils developed last term of using button apps and list apps as they now combine the two skills.

As the year progresses, they build on their understanding of the app making software, making more sophisticated and visually appealing apps.

Spring Term 2 – 3D printed chess set (2021-22 only)

National Curriculum Coverage

- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

- ·use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

What I learn

In this unit, pupils use Tinkercad to create 3D models; building different chess pieces including a pawn, rook, king, queen, bishop and knight, aligning £D shapes and building in layers – grouping solid and hole shapes from the program. These designs are then printed on the 3D printer and used alongside chessboards for a friendly chess match in class.

Progression pathway

As Tinkercad has been newly introduced, this unit will be taught from year 4 – 6 in 2021-22 to ensure all upper KS2 can participate and gain the necessary initial skills of working with the 3D design software.

From 2022-23, this will remain in the year 4 curriculum and be replaced for years 5-6.

Computing
Curriculum Map

Year Six

Summer Term 1 – 3D printed animal keyrings

National Curriculum Coverage

- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

- ·use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

What I learn

In this unit, pupils use Tinkercad software to create a range of 3D animal designs including an octopus and an alligator and learn a range of ways to make their designs have movable parts. They will combine 3D shapes to create models and moving models.

They will use their 3D building skills to create animal-themed keyring models and book bag tags to gift to the new Reception starters who will be joining the school in September. Pupils print these using the 3D printer so that the new-starters can attach them to the book bag of their new uniform on their first day.

Pupils write a personal note welcoming the new pupils, telling them about their experiences of school and explaining the keyring. They package these up in the 'golden envelopes' which are sent out before the summer holidays.

Progression pathway

This unit builds on the pupils' 3D modelling skills. They were first introduced to Tinkercad in the Alpaca unit and learnt the basic tools. This was develped in further units.

In this unit they continue to build upon the skills of placing 3D shapes together using align and group tools, working from design measurements and requirements to follow as a scaffold.

In KS3 these skills will be developed further as pupils become independent in the design process.

Summer Term 2 – Map and location Apps

- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

- use sequence, selection, and repetition in programs; work with variables and various forms of input and output

- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

In this final unit, pupils create an app with a specific brief to solve a problem. They create an app with a map feature which allows a user to search for somewhere nearby (such as a shop or a restaurant) and see a map showing them the quickest route there. They will use a location sensor in their app to get data regarding where the user is and create a data base of local places of interest which may be searched for. They will code and implement a procedure to work out the distance between the user and the places on their data base which match the search requirements and then use a filter to automatically select the closer place which matches the users' search. In the final week, pupils will program the app to open a map to give directions and enable the user to find their chosen location. Within this unit, pupils will learn how apps can use geolocation and location sensors and discuss the benefits and risks associated with this. They will analyse the use of location sensors in popular apps (such as SnapChat maps) and consider how users can adjust settings to ensure they are safe online when using these. Online safety: location settings in apps

Previously, pupils built simple, one-screen apps with a button for the user to press. This unit builds on the app making skills developed throughout Y6 and challenges pupils further as they create a multi-layered app with different screens, layers and features. They now use a range of components (such as location sensors, filters and maps) and consider how these layers fit together within their designs. Pupils now begin to consider the use of apps in the wider world and how they can be used to solve problems. This focus on user experience and design will prepare them for creating more independent programs in KS3.