Nursery 2-3

| Key Vocabulary | Definition |
|---|---|
| touchscreen | A screen that accepts touch gestures. |
| Phone | A machine for speaking to people who aren't with you. |
| Tablet | A type of handheld computer. |

## As a 2/3 year old I will be able to

Use play phones correctly during imaginative play

Have an awareness of touchscreen technology on phones and tablets

Be able to tap a touchscreen and connect this action to an effect on screen

## What I need to know?

That touching a screen can make things happen.

That we have and use technology in our schools and homes.

Nursery 3-4

| Key Vocabulary | Definition |
|---|---|
| Beebot | Programmable floor toy |
| Camera | Device for taking pictures |
| Keyboard | Used to type text into desktop, laptop etc. |

## What I need to know?

That when I press a key on a keyboard, it will make something happen on the computer or device.

That pressing buttons on a Beebot can make it move.

## As a 3/4 year old I will be able to

Use play phones, keyboards, and camera correctly during imaginative play

Play a simple game on an iPad

Name some technological devices eg phone, tablet, camera

Create movement on a Beebot.

Know that you can retrieve information from a computer

Links to prior learning:

Nursery 2-3

Reception

| Key Vocabulary | Definition |
|---|---|
| Beebot | Programmable floor toy |
| Camera | Device for taking pictures |
| Keyboard | Used to type text into desktop, laptop etc. |

## What I need to know?

That a range of technology is used in places such as homes and schools.

That I need a username and password for computing at school.

## By the end of Reception I will be able to

Use a keyboard and mouse to enter username/password.

Access and use simple activities using touch technology

Enter instructions to use a Beebot to make it turn and move forwards and backwards.

Children in reception will also experience computing  through a range of activities from Barefoot computing scheme of work with the Autumn Spring Summer units. These meet several areas of the Early Learning Goals while introducing some skills fundamental to computing. These concepts are outlined below. The units will take place at some point during the Autumn, Spring and Summer term where the Reception teacher feels is appropriate.

| | |
|---|---|
| Autumn | **Gorgeous Garlands:**<br>Creating<br>Children make prints or use the images provided and create repeating patterns on paper strips.<br><br>They may look at examples of repeating patterns first before designing and creating their own.<br><br>As children are creating their patterns, encourage them to keep checking their work, and making changes or fixes where needed.<br><br>Pattern<br>Pattern occurs as children spot what is the same and different in their garland sequences.<br><br>Children can be given the start of a pattern and talk about similarities and differences they can see.<br><br>They predict what comes next in the pattern, and complete and check.<br><br>They may look at patterns with varying rules, e.g. AB, ABB and ABBC.<br><br>Logic<br>As children identify what is repeated in the structure of the pattern, they start to build up a picture of the pattern and further refine their understanding based on new information they find.<br>This is logical reasoning, the cycle of prediction and explaining.<br><br>**Leaf Labyrinth**<br>Logic<br>A key part of logical reasoning is explaining. In this activity, children explain their journey through the maze. They talk about which directions and turns they need to take, and explain the thinking behind their decisions.<br><br>If there are multiple routes through the maze, or multiple start points, they use logical reasoning to predict which route through the maze will be quickest / best and explain their reasons.<br><br>Algorithms<br>An algorithm is a sequence of instructions or a set of rules to get something done. In this activity, children can order or sequence movements needed to navigate through the maze.<br><br>They can use the direction cards to support this, and plan paths for a friend to follow. Children will show more progress in design if they plan their paths ahead. |

| | |
|---|---|
| | Decomposition<br>Decomposition is the process of breaking down a task into smaller, more manageable parts. Children consider the directions and turns needed to navigate through the maze by breaking down or decomposing the route into steps, helping children to learn and remember the sequence.<br><br>Adults model creating the paths in the maze, and using self talk to work out how to decompose the task and work collaboratively.<br><br>Children could also be recorded at each stage of creating the maze and then review the images and ask children what they did.<br><br>Creating<br><br>When creating the maze, children explore how they can work together and express their thoughts and ideas.<br>This fits well with the Building Relationships Early Learning Goal.<br><br>Some may suggest improvements, perhaps saying how to add paths or different ways of doing things.<br><br>As children are making the maze, encourage them to test it out, debugging their design.<br><br>**Pumpkin soup**<br>Algorithms/Decomposition<br>Children look at the images of the soup-making process and put them into order.<br><br>They have created an algorithm – a set of very simple instructions to make pumpkin soup.<br><br>The algorithm is broken down (decomposed) into steps which are in a particular sequence.<br><br>Collaborating<br>When following the recipe, children explore how they can work together, taking turns and waiting patiently, and expressing their thoughts and ideas.<br><br>This fits well with the BuildingRelationships Early Learning Goal. |

| | |
|---|---|
| Spring | **Junk Scarecrows**<br>Abstraction<br>Abstraction is the skill of being able to ignore what is not important, and being able to focus on what is important. When they look at the different scarecrow pictures, they abstract by finding the main common features and decide what is most important and what can be ignored.<br><br>They include the important features in their drawings, which can also be labelled. For example, they may decide that it is important that their scarecrow has a hat, but that the colour of the hat is not important.<br><br>If children are copying an existing design then the abstraction has already been decided for them, but if they create a model independently, then they are abstracting, as they choose what to include and what to ignore.<br><br>Tinkering<br>Tinkering occurs as children try out using different materials for parts of the scarecrow. They may also explore how they can join objects in different ways and see what happens.<br><br>They use logical reasoning to predict which methods and materials might be successful, and which will not.<br><br>As they test their ideas they build up ideas and make predictions about what will work. Even if these are not correct, they continue to try things out.<br><br>They try to explain what they observed, and tell friends what they found out.<br><br>**Run Rabbit Run**<br>Algorithms<br>In this activity, children are creating their own algorithms when they plan a route to get the rabbit to the carrot.<br><br>The steps it will need to take are in a particular sequence and could be as simple as ‘forward, forward, forward’, or ‘forward 3 steps’.<br><br>You might prefer to use a symbol to designate a forward move, such as an arrow. Children will show more progress in algorithm design if they plan ahead – this can be done as a group with an adult scribing, or individually.<br><br>To add complexity to their algorithms, the flower pictures can also be used as either obstacles to avoid, or to collect along with the carrots. |

| | |
|---|---|
| | Persevering<br>Not giving up is important here, as children will sometimes have mistakes in their algorithms.<br><br>To debug (find and fix) their mistake, they will have to go back to their algorithm and check it through, correct the mistake and then test it again by moving the rabbit.<br><br>Having the algorithms written down will make it easier to spot the mistake.<br><br>Collaborating<br>Children work in small groups to plan the route for the rabbit and then test their algorithm using the picture.<br><br>Adults model working collaboratively, taking turns and exploring how working together can extend and elaborate their ideas.<br><br>**Seed Sequencing**<br>Algorithms and decomposition<br>Children look at the planting seeds images and put them into order.<br><br>They have created an algorithm – a set of very simple instructions to show how to plant a seed.<br><br>The algorithm is broken down (decomposed) into steps which are in a particular sequence.<br><br>Collaborating<br>When ordering the pictures and planting the seeds, children explore how they can work together, taking turns and waiting patiently, and expressing their thoughts and ideas. |

| | |
|---|---|
| Summer | **Colour Collection**<br><br>Creating<br>Children collect objects of different shapes and colours from their environment and use them to create a pictogram. Some may suggest different ways of organising their objects.<br><br>As children are creating their pictograms, encourage them to keep checking their work, and making changes or fixes where needed.<br><br>Patterns<br>Pattern occurs as children spot what is the same and different in the objects they have collected. They are learning to identify objects with similar characteristics in order to group them.<br><br>Organising their objects into colour or shape categories will provide opportunities to spot patterns amongst the different groups.<br><br>Children will begin to compare groups and start to identify 'more' and 'less'.<br><br>Persevering<br>Children will demonstrate perseverance by organising their collection of objects into the relevant colour towers, and repeating the process for each colour of the pictogram.<br><br>Encourage children to count as they go and recognise the value of the numbers.<br><br>**Seaside tangrams**<br><br>Tinkering and Creating<br>Using the different 2D shapes, children move, turn, place and overlap them to create their own version of the seaside object. This is tinkering, occurring as they try out different shapes and see what happens.<br><br>Children may need support in seeing shapes in a different orientation.<br><br>Children experiment with arranging the shapes to create the seaside image. Part of the creating process includes checking and fixing, which they do continually as they go along.<br><br>Debugging<br>As children are creating their tangrams, encourage them to keep checking and evaluating and making any changes needed (debugging their design). Some may suggest using other shapes, or rotating existing ones to make improvements. |

| | |
|---|---|
| | Persevering<br>Children will demonstrate perseverance by swapping and testing different shapes until they achieve the desired outcome. They may also need to be encouraged to rotate shapes to see how they look in different orientations.<br><br>**Journeys**<br><br>Logic<br>A key part of logical reasoning is explaining. In this activity, children explain how they see their journey. They talk about where different items go, how they look and where they are positioned in relation to other items.<br><br>Algorithms<br>In this activity, children think about the concept of sequencing when ordering what they see on their journey. They can consider where objects are in relation to each other within the sequence.<br><br>Creating<br>Children may create their maps by drawing objects, placing items and /or using boxes to represent buildings.<br><br>Some may suggest improvements, or offer alternative ways of doing things. As children are retelling their adventure stories, encourage them to test out their maps, debugging their design. Some may suggest what they like and what they might improve.<br><br>Collaborating<br>When creating their maps and retelling stories, children explore how they can work together to express their thoughts verbally or physically, and to extend and elaborate their ideas. |

**YEAR 1**

Autumn 1 - Technology around us

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| Logon | Identifying the user to the computer | To name parts of the computer. (see vocab)<br>That technology is something that helps us.<br>Of examples of technology in the classroom.<br>How these technology examples help us.<br>That I need to stay safe online. |
| username | The unique name for each user of a computer system | |
| password | A secret word that helps identify you to the computer. | |
| Open | Starting a program or app | |
| close | Stop using a program or app | |
| Program/app | A tool the computer has to help you perform particular tasks. | |
| Keyboard | The set of keys that control a computer. | |
| mouse | Tool used to move the cursor around the screen. | |
| Mouse button | Switch on the top of the mouse - normally two. | |
| click | Pressing the button | |
| click , hold and drag | Pressing and holding a button to allow you to move objects around the screen. | |
| edit | To change something you have created. | |

By the end of this unit, I will be able to:

Identify a computer and its main parts.

Use a mouse in different ways

Use a keyboard to type on a computer

Use the keyboard to edit text

Create rules for using technology responsibly

Autumn 2 - Moving a robot.

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| Beebot | A programmable toy. | That commands given to the ‘computer’ initiate actions.<br><br>That commands need to be precise and use particular language.<br><br>That commands can be combined to create a sequence.<br><br>That there may be more than one solution to a ‘problem’. |
| Sequence | A set of instructions to carry out more than one action. | |
| Debug | To find and solve problems in a program. | |

<u>By the end of this unit, I will be able:</u>

To explain what a given command will do.

To combine ‘forwards’ and ‘backwards’ commands to make a sequence

To combine four direction commands to make sequences

To plan a simple program

To find more than one solution to a problem

Spring 1 - Digital painting

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| pen | Solid line drawing tool | That a computer can help me create, save, retrieve and edit content.<br><br>That computers can be used to create graphical (picture) content.<br><br>How a computer and paper will differ in the content they create. |
| brush | A graded line drawing tool | |
| Shape | A tool for drawing shapes | |
| Line | A tool to create straight lines | |

<u>By the end of this unit, I will be able:</u>

To describe what different freehand tools do.

To use the shape tool and the line tools

To make careful choices when painting a digital picture

To explain why I chose the tools I used

To use a computer on my own to paint a picture

To compare painting a picture on a computer and on paper

Spring 2 - Digital writing

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| Text | writing | To know that computers can be used to create text that can be saved and edited.<br><br>That the text can be changed in appearance. |
| Font | A particular appearance for letters and numbers. | |
| Caps lock | A button to change lower case letters to upper case. | |
| Toolbar | An area on the screen containing tools. | |
| Underline | Text with a line underneath | |
| Bold | Darker text | |
| italic | Sloping text | |

<u>By the end of this unit, I will be able:</u>

To use a computer to write

To add and remove text on a computer

To identify that the look of text can be changed on a computer

To make careful choices when changing text

To explain why I used the tools that I chose

To compare typing on a computer to writing on paper

Summer 1 - Introduction to animation

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| Animation | Moving images | That commands are given using blocks that create a particular ‘action’.<br><br>That blocks can be joined together.<br><br>That values in these sequences can be changed. |
| Block | The ‘jigsaw’ pieces that contain instructions. | |
| Sprite | A programmable character in Scratch | |
| Background | A non-programmable scene in scratch | |
| Value | A number | |
| Algorithm | A series of instructions to carry out a desired ‘action’. | |

By the end of this unit, I will be able:

To choose a command for a given purpose

To show that a series of commands can be joined together

To identify the effect of changing a value

To explain that each sprite has its own instructions

To design the parts of a project

To use my algorithm to create a program

**YEAR 2**

Autumn 1 - Robot algorithms

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| Algorithm | A series of instructions to carry out a desired 'action'. | That computers can only follow clear instructions.<br><br>That order may effect the outcome of a set of instructions.<br><br>That algorithms may be be broken into chunks to enable easier design. |
| outcome | What happens when an algorithm is run. | |
| debug | To find and correct errors in an algorithm | |

By the end of this unit, I will be able:

To describe a series of instructions as a sequence

To explain what happens when we change the order of instructions

To use logical reasoning to predict the outcome of a program

To explain that programming projects can have code and artwork

To design an algorithm

To create and debug a program that I have written

Autumn 2 - Introduction to quizzes

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| outcome | What happens when an algorithm is run. | That a sequence of commands has an ‘outcome’.<br><br>That an algorithm can be predicted.<br><br>That an existing algorithm may be edited for a new purpose. |

By the end of this unit, I will be able:

To explain that a sequence of commands has a start

To explain that a sequence of commands has an outcome

To create a program using a given design

To change a given design

To create a program using my own design

To decide how my project can be improved

Spring 1 - Pictograms

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| attribute | An aspect of an object | That we can present information using a computer<br><br>That information ca be represented in a picture form.<br><br>That data needs to be organised in order to interpret it.<br><br>To know that it may not always be safe to share data. |
| Pictogram | A chart that uses pictures to represent data. | |
| Data | Information | |

By the end of this unit, I will be able:

To recognise that we can count and compare objects using tally charts

To recognise that objects can be represented as pictures

To create a pictogram

To select objects by attribute and make comparisons

To recognise that people can be described by attributes

Spring 2 - IT around us

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| Information technology (IT) | Information technology (IT) is the use of computers to store, retrieve, transmit, and manipulate data or information | That IT may take different forms and isn't limited to computers.<br><br>That homes, shops and schools all use IT in different ways.<br><br>That using IT may have benefits.<br><br>That using IT may have risks and may need particular rules when using.<br><br>That the user needs to be responsible in their use of IT. |

By the end of this unit, I will be able:

To recognise the uses and features of information technology

To identify the uses of information technology in the school

To identify information technology beyond school

To explain how information technology helps us

To explain how to use information technology safely

To recognise that choices are made when using information technology

Summer 1 - Making music

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| rhythm | The pattern of sound in a piece of music | That music can create different feelings.<br><br>That there are patterns in music.<br><br>That music is often created to reflect a particular situation or object. |
| pitch | Whether a note is high or low | |

By the end of this unit, I will be able:

To say how music can make us feel

To identify that there are patterns in music

To experiment with sound using a computer

To use a computer to create a musical pattern

To create music for a purpose

To review and refine our computer work

**Year 3**

Autumn 1 - Sequence in sounds

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| Sprite | A part of the app that can be programmed to carry put instructions | That there are different elements that make up a Scratch 'screen'<br><br>That sprites can be programmed to carry out instructions.<br><br>That commands are represented as blocks.<br><br>That there are a number of ways to start a set of instructions.<br><br>To recognise the need for order in instructions. |
| Backdrop | A static 'scene' on which sprites carry out instructions. | |
| Command block | A block that contains instructions for a sprite | |

By the end of this unit, I will be able:

Describe the actions a chosen block creates.

Create a program following a design

Explain what a sequence is.

Create a project from a task description.

Autumn 2 - Desktop publishing

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| text | Writing produced by computers | That text and images can be used together or separately to create a message.<br><br>That templates can be used to re-create styles with new content.<br><br>That layouts change depending on the purpose of the text. |
| images | Pictures produced by computers | |
| Return key | Moves the cursor to the next available line | |
| Backspace | Removes letters one at a time from cursor point | |
| Shift key | Gives second function for each key | |
| templates | A base to build a text upon | |
| Orientation | The way round a text/image appears | |
| Placeholders | ‘Boxes’ for images or text to be contained in. | |

<u>By the end of this unit, I will be able:</u>

To recognise how text and images convey information

To recognise that text and layout can be edited

To choose appropriate page settings

To add content to a desktop publishing publication

To consider how different layouts can suit different purposes

To consider the benefits of desktop publishing

Spring 1 - Events and actions

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| Events | Actions or occurrences that happen in the system you are programming, which the system tells you about so your code can react to them | I can explain the relationship between an event and an Action<br><br>I can consider the real world when making design choices |
| Extension blocks | Make it possible for Scratch to interface with external hardware and information outside of the Scratch website through new blocks | |
| Debugging | Process of finding and fixing errors in code | |

<u>By the end of this unit, I will be able:</u>

To choose which keys to use for actions
To identify a way to improve a program
To program movement
To choose blocks to set up my program
To build more sequences of commands to make my design work
To test a program against a given design
To modify a program using a design

Spring 2 - Branching databases

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| attribute | The properties of objects in a database | That a database is a collection of information about given subjects.<br>That two groups of objects can separated by one attribute.<br>That groups can be created within existing groups by using another attribute.<br>That this type of database and questioning forms a ‘tree’.<br>That there are real world uses for this type of database. |
| Value | The answers to database attributes | |
| database | A collection of data that can be searched or sorted | |

By the end of this unit, I will be able:

To create questions with yes/no answers

To identify the attributes needed to collect data about an object

To create a branching database

To explain why it is helpful for a database to be well structured

To plan the structure of a branching database

To independently create an identification tool

Summer 1 - Connecting computers

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| input | when information enters a system. | These concepts of input, process, and output are fundamental to all digital devices.<br><br>That digital and non-digital devices may both be used to produce the same result.<br><br>That many devices are now connected with others.<br><br>There are a number of specialist components in a network. |
| Process | what happens to the information entered | |
| output | The result of the process | |
| Wifi | A wireless method of devices connecting with each other. | |
| network | A series of connected devices. | |
| Server | A computer that provides a service to another computer. | |
| Switch | A device in a network that sends data to the correct device. | |
| Wifi access point | A place where the wifi signal is sent/received | |

By the end of this unit, I will be able:

To explain how digital devices function

To identify input and output devices

To recognise how digital devices can change the way that we work

To explain how a computer network can be used to share information

To explore how digital devices can be connected

To recognise the physical components of a network

**Year 4**

Autumn 1 - Repetition in shapes

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| Logo | A text based programming language | That programming may take the form of a written language.<br><br>That programming languages use specific words that need to be spelt correctly and be ordered correctly.<br><br>That a repeat command can be useful to save lengthy algorithms.<br><br>That procedures can be created then recalled for later use. |
| procedure | A named set of instructions. | |
| Count-controlled loop | A program that repeats a number of times. | |

By the end of this unit, I will be able:

To identify that accuracy in programming is important

To create a program in a text-based language

To explain what ‘repeat’ means

To modify a count-controlled loop to produce a given outcome

To decompose a task into small steps

To create a program that uses count-controlled loops to produce a given outcome

Autumn  2 - Audio Editing

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| audio | Media we here rather than see. | That sound can be recorded digitally and that devices may have input and outputs for this.<br><br>That audio can be edited.<br><br>That podcasts have particular features. |
| trim | To cut portions away from a recording | |
| podcast | a collection or series of digital audio files that are made available for downloading or listening via the Internet. | |
| | | |

<u>By the end of this unit, I will be able:</u>

To identify that sound can be recorded

To explain that audio recordings can be edited

To recognise the different parts of creating a podcast project

To apply audio editing skills independently

To combine audio to enhance my podcast project

To evaluate the effective use of audio

Spring 1- Repetition in games

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| Infinite loop | A loop that will run until stopped by the user | That loops take different forms: infinite loops and count-controlled loops.<br><br>That different types of loop are needed for different purposes.<br><br>That different loops can be run at the same time. |
| Code snippet | A small amount of code | |
| | | |

By the end of this unit, I will be able:

To develop the use of count-controlled loops in a different programming environment

To explain that in programming there are infinite loops and count-controlled loops

To develop a design that includes two or more loops which run at the same time

To modify an infinite loop in a given program

To design a project that includes repetition

To create a project that includes repetition

Spring 2 - The internet

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| Internet | a worldwide system of computer networks | That a network can share messages with another network to form the internet.<br><br>That the World Wide Web is part of the internet which contains websites and web pages.<br><br>That different media can be shared on the World Wide Web and where websites are stored.<br><br>That there are rules about what you can do with content found on the web.<br><br>That not everything they see is true and honest. |
| World wide web | A collection of websites found on the internet. | |
| | | |

<u>By the end of this unit, I will be able:</u>

To describe how networks physically connect to other networks

To recognise how networked devices make up the internet

To outline how websites can be shared via the World Wide Web (WWW)

To describe how content can be added and accessed on the World Wide Web (WWW)

To recognise how the content of the WWW is created by people

To evaluate the consequences of unreliable content

Summer 1 - photo editing

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| Cloning | Copying a part of an image for re-use. | That specific applications are available to edit photos.<br><br>That different effects can be applied for specific scenarios.<br><br>That parts of a photo can be removed or duplicated using cloning.<br><br>That two or more images can be combined. |
| Retouching | Changing small aspects of a photo to improve it. | |
| | | |

<u>By the end of this unit, I will be able:</u>

To explain that the composition of digital images can be changed

To explain that colours can be changed in digital images

To explain how cloning can be used in photo editing

To explain that images can be combined

To combine images for a purpose

To evaluate how changes can improve an image

**YEAR 5**

Autumn 1 Flat file databases

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| Database | A collection of information points about similar group of items. | That a database consists of ‘records’, and that each record contains ‘fields’. |
| Record | Each set of information | That how records can be grouped |
| Fields | Information points | That specific questions can be asked about the data. |

By the end of this unit, I will be able:

To use a form to record information

To compare paper and computer-based databases

To outline how you can answer questions by grouping and then sorting data

To explain that tools can be used to select specific data

To explain that computer programs can be used to compare data visually

To use a real-world database to answer questions

Autumn 2 - Vector drawing

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| Vector drawing | a computer-made image that is made up of points, lines, and curves | That vector drawings are made up of simple shapes and lines.<br><br>That each element of a vector drawing is called an object.<br><br>That objects can be a manipulated to produce a new image.<br><br>That objects are created on layers that can be re-ordered.<br><br>That objects can be grouped. |
| layers | ‘Pages’ of transparent ‘paper’ that can be re-ordered. | |
| | | |

By the end of this unit, I will be able:

To identify that drawing tools can be used to produce different outcomes

To create a vector drawing by combining shapes

To use tools to achieve a desired effect

To recognise that vector drawings consist of layers

To group objects to make them easier to work with

To apply what I have learned about vector drawings

Spring 1 - Selection in physical computing

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| Selection | A decision making process. | That computers can be used to control physical machines.<br><br>That computers can use conditions such as true and false in order to make ‘decisions’ about actions to take.<br><br>That ‘if’ ‘then’ statements are needed in order for multiple options to be taken. |
| Condition | A state such as on and off or true and false. | |
| | | |

By the end of this unit, I will be able:

To control a simple circuit connected to a computer

To write a program that includes count-controlled loops

To explain that a loop can stop when a condition is met

To explain that a loop can be used to repeatedly check whether a condition has been met

To design a physical project that includes selection

To create a program that controls a physical computing project

Spring 2 - Sharing information

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| Search engine | A tool used to search websites | That computers can be grouped together into systems.<br><br>That computer systems have a role in everyday lives.<br><br>That search engines are designed to help users locate information on web pages.<br><br>That search engines do not always produce the results expected.<br><br>That there are outside factors effecting the results of a web search. |
| Search bar | Area on a search engine to enter the search details | |
| Address bar | Area on a webpage that will allow the user to enter the webpage address or search details. | |
| Web crawler | An unseen tool that looks for information on the internet. | |

By the end of this unit, I will be able:

To explain that computers can be connected together to form systems

To recognise the role of computer systems in our lives

To identify how to use a search engine

To describe how search engines select results

To explain how search results are ranked

To recognise why the order of results is important, and to whom

Summer 1 - Selection in quizzes

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| If then else | A series of program statements that allow multiple options to be carried out. | That there may be two outcomes in given programs and how the condition informs which outcome will be selected.<br><br>That the ‘if… then... else…’ structure can be used to identify two responses to a binary question |

By the end of this unit, I will be able:

To explain how selection is used in computer programs

To relate that a conditional statement connects a condition to an outcome

To explain how selection directs the flow of a program

To design a program that uses selection

To create a program that uses selection

To evaluate my program

**YEAR 6**

Autumn 1 - Variables in games

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| Variable | a value that can change, depending on conditions or on information passed to the program. | That a variable is vital to some programming that can be changed by the program or an input.<br><br>That variables can only hold a single value at a time.<br><br>That *where* variables are changed will affect the algorithm in different ways. |

By the end of this unit, I will be able:

To define a ‘variable’ as something that is changeable

To explain why a variable is used in a program

To choose how to improve a game by using variables

To design a project that builds on a given example

To use my design to create a project

To evaluate my project

Autumn 2 - Computing systems and networks – Communication

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| Packets | Small parts of a larger amount of data. | That computers use IP addresses and protocols to communicate with each other.<br><br>That data is transferred in packets (small parts).<br><br>That groups may work collaboratively while being in distant locations using the internet.<br><br>That work may be shared for other users to manipulate and change. |
| IP address | A numeric internet address | |
| Protocol | A set of rules | |

By the end of this unit, I will be able:

To explain the importance of internet addresses

To recognise how data is transferred across the internet

To explain how sharing information online can help people to work together

To evaluate different ways of working together online

To recognise how we communicate using technology

To evaluate different methods of online communication

Spring 1 - Sensing

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| Value | A numeric value used to compare variables with as a condition | That if, then, else statements are used to direct the flow of a program.<br><br>That variables may be updated with a user input.<br><br>That variables can be compared to a value to create conditional flow. |
| accelerometer | A device that detects movement in a number of directions. | |
| micro:bit | A small, simple computer that has an input, process and output | |

By the end of this unit, I will be able:

To create a program to run on a controllable device

To explain that selection can control the flow of a program

To update a variable with a user input

To use an conditional statement to compare a variable to a value

To design a project that uses inputs and outputs on a controllable device

To develop a program to use inputs and outputs on a controllable device

Spring 2 - Spreadsheets

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| Cell | A ‘box’ on a spreadsheet where data or formulas are placed. | That a spreadsheet is an electronic document used for the storage and manipulation of large amounts of data.<br><br>That a spreadsheet has a strict structure but that cells can be formatted for particular purposes.<br><br>That data can be manipulated using formulas. |
| Formula | A mathematical calculation. | |
| Spreadsheet | An electronic document in which data is arranged in the rows and columns of a grid and can be manipulated and used in calculations. | |
| cell references | The name or location of a particular cell. | |

By the end of this unit, I will be able:

To create a data set in a spreadsheet

To build a data set in a spreadsheet

To explain that formulas can be used to produce calculated data

To apply formulas to data

To create a spreadsheet to plan an event

To choose suitable ways to present data

Summer 1 - 3D modelling

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| rotation | Moving the object through three dimensions. | That computers can create virtual 3D objects and environments.<br><br>These objects can be manipulated and modified.<br><br>That 3D models can be used to produce real objects through 3D printing. |
| 3D printing | A method of using a resin to create 3D objects. | |

By the end of this unit, I will be able:

To recognise that you can work in three dimensions on a computer

To identify that digital 3D objects can be modified

To recognise that objects can be combined in a 3D model

To create a 3D model for a given purpose

To plan my own 3D model

To create my own digital 3D model

Summer 2 - Creating media – Web page creation

| Key vocabulary | Definition | What I need to know |
|---|---|---|
| HTML | Hypertext Meta language - a language used to code many web pages | That websites are created using HTML code.<br><br>That some items are protected by copyright whereas others may be used for 'fair use'.<br><br>That websites have a structure that needs to be navigable by the user.<br><br>That websites may rely on user evaluation to improve or correct. |
| Copyright | Copyright ownership gives the owner the exclusive right to use the work. | |
| Fair use | Fair use gives users the right to use copyrighted material without permission under certain circumstances. | |
| Tags | Code that identifies what each part of a web page is. | |
| Hyperlinks | Clickable links to take the user to other electronic areas/resources. | |

By the end of this unit, I will be able:

To review an existing website and consider its structure

To plan the features of a web page

To consider the ownership and use of images (copyright)

To recognise the need to preview pages

To outline the need for a navigation path

To recognise the implications of linking to content owned by other people