**Y4 Computing**

| Coding |
|---|
| Spring 2 (6 lessons) |

**Statutory NC Objectives KS2 Computing**:
- 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

| Key Vocabulary | | | Key Knowledge |
|---|---|---|---|
| **ANCHOR WORDS** | **GOLDILOCKS WORDS** | **STEP-ON WORDS** | By the end of this unit, the pupils should know that: |
| **Alert** - This is a type of output. It shows a pop up of text on the screen. <br> **Debug/Debugging** - Fixing code that has errors so that the code will run the way it was designed to. <br> **Repeat** - This command can be used to make a block of commands run a set number of times or forever. <br> **Run** - Clicking the Play button to make the computer respond to the code. | **Algorithm** - A precise, step-by-step set of instructions used to solve a problem or achieve an objective. <br> **Execute** - This is the proper word for when you run the code. We say, 'the program (or code) executes. <br> **'If/Else' Statement** - A conditional command. This tests a statement. <br> **Sequence** - This is when a computer program runs commands in order. <br> **Variable** - A named area in computer memory. A variable has a name and a value. | **Code blocks** - A way to write code using blocks which each have an object or an action. Each group of blocks will run when a specific condition is met or when an event occurs. | <ul><li>To begin to understand selection in computer programming.</li><li>To understand how an IF statement works.</li><li>To understand how to use co-ordinates in computer programming.</li><li>To understand the 'repeat until' command.</li><li>To understand how an IF/ELSE statement works.</li><li>To understand what a variable is in programming.</li><li>To use a number variable.</li><li>To create a playable game.</li></ul> |

| **"Bridging Back"** (previous years/cross-curricular content) | **"Bridging Forward"** (future years/cross curricular content) |
|---|---|
| Year 1 – Coding, Lego Builders, Maze Explorers <br> Year 2 – Coding, Questioning <br> Year 3 – Coding, Branching Databases | Year 5 – Coding <br> Year 6 – Coding, Binary |

## Online Safety

Summer 1 (4 lessons)

**Statutory NC Objectives KS2 Computing**:
· use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

| Key Vocabulary | | | Key Knowledge |
|---|---|---|---|
| **ANCHOR WORDS** | **GOLDILOCKS WORDS** | **STEP-ON WORDS** | By the end of this unit, the pupils should know that: |
| **Attachment** - A file, which could be a piece of work or a picture, that is sent with an email.<br>**SMART rules** - A set of rules based around the word SMART designed to help you stay safe when online. SMART represents the words Safe, Meet, Accept, Reliable, Tell. | **Copyright** - When the rights to something belong to a specific person.<br>**Digital footprint** - The information about a person that exists on the Internet as a result of their online activity.<br>**Virus** - A piece of code which can copy itself and typically has a damaging effect on the device, such as corrupting the system or destroying data. | **Cookies** - A small amount of data generated by a website and saved by a web browser. Its purpose is to remember information about the user.<br>**Malware** - Software that is specifically designed to disrupt, damage, or gain unauthorised access to a computer system.<br> **Plagiarism** - Taking someone else's work or ideas and passing them off as one's own.<br>**Ransomware** - A type of malicious software designed to block access to a computer system until a sum of money is paid. | <ul><li>To understand how children can protect themselves from online identity theft.</li><li>To understand that information put online leaves a digital footprint or trail and that this can aid identity theft.</li><li>To identify the risks and benefits of installing software including apps.</li><li>To understand that copying the work of others and presenting it as their own is called 'plagiarism' and to consider the consequences of plagiarism.</li><li>To identify appropriate behaviour when participating or contributing to collaborative online projects for learning.</li><li>To identify the positive and negative influences of technology on health and the environment.</li><li>To understand the importance of balancing game and screen time with other parts of their lives.</li></ul> |

**"Bridging Back"** (previous years/cross-curricular content)

Year 1 – Online Safety, Technology Outside School
Year 2 – Online Safety, Effective Searching
Year 3 – Online Safety, Email

**"Bridging Forward"** (future years/cross curricular content)

Year 5 – Online Safety, Word Processing
Year 6 – Online Safety, Blogging

## Spreadsheets

Autumn 1 (5 lessons)

**Statutory NC Objectives**:
- KS2 Computing
- 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

| Key Vocabulary | | | Key Knowledge |
|---|---|---|---|
| **ANCHOR WORDS** | **GOLDILOCKS WORDS** | **STEP-ON WORDS** | By the end of this unit, the pupils should know that: |
| **Chart** - A diagram that represents data. Charts include graphs and other diagrams such as pie charts or flowcharts.<br>**Decimal place** - The position of a digit to the right of a decimal point.<br>**Spreadsheet** - A computer program that represents data in cells in a grid of rows and columns. Any cell in the grid may contain either data or a formula that describes the value to be inserted based on the values in other cells. | **Format Cell** - The way that data is displayed in a cell. For example using units such as £ or $.<br>**Formula** - A group of letters, numbers, or other symbols which represents a scientific or mathematical rule. The plural of formula is formulae. | **Formula Wizard** - Use the formula wizard or type into the formula bar to create a formula in a cell, this will calculate the value for the cells based upon the value of other cells in the spreadsheet. | <ul><li>To format cells as currency, percentage, decimal to different decimal places or fraction.</li><li>To use the formula wizard to calculate averages.</li><li>To combine tools to make spreadsheet activities such as timed times tables tests.</li><li>To use a spreadsheet to model a real-life situation.</li><li>To add a formula to a cell to automatically make a calculation in that cell.</li></ul> |
| **"Bridging Back"** (previous years/cross-curricular content)<br><br>Year 1 – Spreadsheets, Pictograms<br>Year 2 – Spreadsheets, Questioning<br>Year 3 – Spreadsheets, Graphing | | | **"Bridging Forward"** (future years/cross curricular content)<br><br>Year 5 – Spreadsheets, Databases<br>Year 6 - Spreadsheets |

## Writing for Different Audiences

Autumn 2 (5 lessons)

**Statutory NC Objectives KS2 Computing**:
- · 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

| Key Vocabulary | | | Key Knowledge |
|---|---|---|---|
| **ANCHOR WORDS** | **GOLDILOCKS WORDS** | **STEP-ON WORDS** | By the end of this unit, the pupils should know that: |
| **Font** - A set of type which shows words and numbers in a particular style and size. **Opinion** - A view or judgment someone forms about something, not always based on fact. | **Format** - The way in which something is arranged or set out. **Genre** - The style or category type of a piece of art, music or writing. | **Campaign** - An organised course of action to achieve a goal. | • To explore how font size and style can affect the impact of a text. • To use a simulated scenario to produce a news report. • To use a simulated scenario to write for a community campaign. |

| **"Bridging Back"** (previous years/cross-curricular content) | **"Bridging Forward"** (future years/cross curricular content) |
|---|---|
| Year 1 – Animated Stories Year 2 – Presenting Ideas Year 3 – Touch Typing, Simulations, Presenting, Email | Year 5 – Concept Maps, Word Processing Year 6 – Blogging |

## Logo

Summer 1 (4 lessons)

**Statutory NC Objectives KS2 Computing**:
· 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

| Key Vocabulary | | | Key Knowledge |
|---|---|---|---|
| **ANCHOR WORDS** | **GOLDILOCKS WORDS** | **STEP-ON WORDS** | By the end of this unit, the pupils should know that: |
| **Debugging** - The process of identifying and removing errors from computer hardware or software.<br>**Grid** - The template around which the 2Logo turtle moves. | **LOGO** - A text-based coding language used to control an on screen turtle to create mathematical patterns.<br>**Procedure** - Pieces of Logo text with a procedure name that can be run by calling them by name. Saves time if you want to print to screen lots of the same shape.<br>**Run Speed** - The speed at which the 2Logo turtle moves around the screen. | **LOGO Commands (e.g FD, BK, RT, LT)** - A list of commands inputted into 2Logo to move the turtle around the screen. Multi Line Mode - Type several lines of commands in the text area. | • To learn the structure of the coding language of Logo.<br>• To input simple instructions in Logo.<br>• Using 2Logo to create letter shapes.<br>• To use the Repeat function in Logo to create shapes.<br>• To use and build procedures in Logo. |

| **"Bridging Back"** (previous years/cross-curricular content)<br><br>Year 1 – Lego Builders, Maze Explorers, Coding<br>Year 2 – Coding, Questioning<br>Year 3 – Coding, Branching Databases | **"Bridging Forward"** (future years/cross curricular content)<br><br>Year 5 – Coding, Game Creator, 3D Modelling<br>Year 6 - Coding |
|---|---|

**Y4 Computing**

<table>
<tr><td colspan="4" align="center">**Animation**</td></tr>
<tr><td colspan="4" align="center">Summer 2 (3 lessons)</td></tr>
<tr><td colspan="4">**Statutory NC Objectives KS2 Computing**:<br>·   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</td></tr>
<tr><td colspan="3" align="center">**Key Vocabulary**</td><td align="center">**Key Knowledge**</td></tr>
<tr>
<td>**ANCHOR WORDS**</td>
<td>**GOLDILOCKS WORDS**</td>
<td>**STEP-ON WORDS**</td>
<td>By the end of this unit, the pupils should know that:</td>
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<tr>
<td>**Animation** - The process of adding movement to still objects.</td>
<td>**FPS (Frames Per Second)** - The number of frames played per second.<br>**Frame** - A single image in an animation.<br>**Stop motion** - A technique whereby the camera is repeatedly stopped and started, for example to give animated figures the impression of movement.</td>
<td>**Onion Skinning** - A process where the shadow image of the previous frame is present to help you line up the objects of the animation correctly.</td>
<td><ul><li>To discuss what makes a good animated film or cartoon.</li><li>To learn how animations are created by hand.</li><li>To find out how animation can be created in a similar way using the computer.</li><li>To learn about onion skinning in animation.</li><li>To add backgrounds and sounds to animations.</li><li>To be introduced to 'stop motion' animation.</li></ul></td>
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<tr>
<td colspan="3">**"Bridging Back"** (previous years/cross-curricular content)<br><br>Year 1 – Animated Stories<br>Year 2 – Creating Pictures</td>
<td>**"Bridging Forward"** (future years/cross curricular content)<br><br>Year 5 – Game Creator, 3D Modelling</td>
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## Effective Searching

Summer 2 (3 lessons)

**Statutory NC Objectives KS2 Computing**:
· use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content

| Key Vocabulary | | | Key Knowledge |
|---|---|---|---|
| **ANCHOR WORDS** | **GOLDILOCKS WORDS** | **STEP-ON WORDS** | By the end of this unit, the pupils should know that: |
| **Internet** - A global computer network providing a variety of information and communication facilities. | **Reliability** - The degree to which the result of something can be depended on to be accurate. **Results page** - Where the answers to a search are displayed. **Search engine** - A program that searches for and identifies items in a database. Used especially for finding sites on the World Wide Web. | **Balanced View** - Presenting opposing points of view fairly and without bias. **Easter eggs** - An unexpected or undocumented feature in a piece of computer software or on a DVD, included as a joke or a bonus. | • To locate information on the search results page. • To use search effectively to find out information. • To assess whether an information source is true and reliable. |

| **"Bridging Back"** (previous years/cross-curricular content) | **"Bridging Forward"** (future years/cross curricular content) |
|---|---|
| Year 1 – Online Safety, Technology Outside School Year 2 – Online Safety, Effective Searching Year 3 – Online Safety | Year 5 – Online Safety, Word Processing Year 6 – Online Safety, Networks |

| Making Music |
|---|
| Spring 1 (4 lessons) |

**Statutory NC Objectives KS2 Computing**:
· 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

| Key Vocabulary | | | Key Knowledge |
|---|---|---|---|
| **ANCHOR WORDS**<br><br>**Rhythm** - A pattern of long and short sounds and silences.<br>**Tempo** - How slow or fast a piece of music is. | **GOLDILOCKS WORDS**<br><br>**Dynamics** - How loud or quiet a sound is.<br>**Melody** - A sequence of notes which make up a tune.<br>**Pitch** - How high or low a sound is.<br>**Pulse** - The steady beat of a piece of music. | **STEP-ON WORDS**<br><br>**BPM Beats per Minute**.<br>- Changing the BPM changes the speed of the music.<br>**Synths** - Short for synthesizer. Electronic musical instrument sounds. | By the end of this unit, the pupils should know that:<br><br>• To identify and discuss the main elements of music.<br>• To understand and experiment with rhythm and tempo.<br>• To create a melodic phrase.<br>• To electronically compose a piece of music. |
| **"Bridging Back"** (previous years/cross-curricular content)<br><br>Year 1 – Animated Story Book<br>Year 2 – Making Music | | | **"Bridging Forward"** (future years/cross curricular content)<br><br>Year 5 – Game Creator |

**Y4 Computing**

| Introduction to AI |
|---|
| Autumn 2 (4 lessons) |

**Statutory NC Objectives KS2 Computing**:
- 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

| Key Vocabulary | | | Key Knowledge |
|---|---|---|---|
| **ANCHOR WORDS** | **GOLDILOCKS WORDS** | **STEP-ON WORDS** | By the end of this unit, the pupils should know that: |
| **Data** - A collection of information, especially facts or numbers, obtained by observation, questions or measurement to be analysed and used to help decision-making. | **Algorithm** - A precise, step-by-step set of instructions used to solve a problem or achieve an objective. | **Artificial Intelligence** - Computer systems able to perform tasks normally requiring human intelligence, such as seeing things, speech recognition, decision-making, and translation between languages. | • To learn what is meant by the term artificial intelligence.<br>• To be clear about ways artificial intelligence is used in our everyday lives.<br>• To consider the future of artificial intelligence<br>• To look at how artificial intelligence is used in music and the arts to create things. |
| **"Bridging Back"** (previous years/cross-curricular content)<br><br>Year 1 – Technology outside School | | **"Bridging Forward"** (future years/cross curricular content)<br><br>Year 6 - Networks | |