



Unit/Term	Focus	Hardware /Software	Computing POS focus	Cross Curricular link
<b>6.1</b> <b>We are toy makers</b>  <b>HT1</b>	Coding and physical computing	Laptops/desktops/Chromebooks micro:bits MakeCode Scratch iPadS	Computer Science: Coding	Science – Light – using microbits/ipads to take light/temp levels around school
<b>6.2</b> <b>We are computational thinkers</b>  <b>HT2</b>	Mastering algorithms for searching, sorting maths	Laptops/desktops/Chromebooks Scratch iPads Snap!	Computer Science: Computational thinking	Maths – coin sorter/ counter – what is the smallest number of coins needed to make the change?
<b>6.3</b> <b>We are publishers</b>  <b>HT3</b>	Creating/publishing an App	Laptops/desktops/Chromebooks Digital cameras or iPads  Appshed	Information Technology: Media	Online Safety – Mental Health/ Wellbeing
<b>6.4</b> <b>We are connected</b>  <b>HT4</b>	Developing skills for social media	Laptops/desktops/Chromebooks Digital cameras or iPads School blogging platform Padlet Audio recorders or other tablets	Digital Literacy: Online safety	PSHE – Healthy Minds/ Body Image
<b>6.5</b> <b>We are advertisers</b>  <b>HT5</b>	Creating a short television advert	Laptops/desktops/Chromebooks Digital cameras or tablets iMovie Green Screen	Information Technology: Media	English – persuasion
<b>6.6</b> <b>We are AI developers</b>  <b>HT 6</b>	Learning about artificial intelligence and machine learning	Laptops/desktops/Chromebooks iPads Scratch Machine Learning for Kids Audacity Google Chrome Smart speaker (Google Home/ Amazon Echo)	Computer Science: Coding	Science – Electricity



**Curriculum Area: Computing – Autumn HT1 - 6.1 We are Toy Makers**

In this unit, pupils will learn:

- how computers use stored programs to connect input to output
- how to generate and evaluate designs in response to a brief
- to plan a complex project by decomposing it into smaller parts
  - to work with physical components of a system
- how to design and write a program for an embedded system
- to use criteria to provide others with feedback on their work

Progression:

In Key Stage 1:

- Pupils were introduced to programming a robot in Unit 1.1: We are treasure hunters.

In Key Stage 2:

- Pupils were introduced to programming the micro:bit using the MakeCode editor in Unit 4.2: We are makers

Pupils will learn	Skills/Implementation	Vocabulary Children Will Learn	Assessment (Impact) - By the end of this Unit:
1. Revisit Micro: Bits/ Make CODE	<ul style="list-style-type: none"> <li>• Pupils will learn how to draw a plan/ aerial view of the school</li> <li>• They will make predictions of where the lightest and darkest places are in school</li> <li>• They will use ipad with self made diffuser to take readings, then compare this to the readings they get after programming their own light meter using a micro bit.</li> </ul>	<ul style="list-style-type: none"> <li>• Light level</li> <li>• Reading / sensor</li> <li>• Make code</li> <li>• Ambient</li> <li>• Lux</li> <li>• Refract</li> <li>• Diffuser</li> <li>• Forever</li> <li>• Plot</li> <li>• Accelerometer</li> <li>• Bluetooth</li> <li>• Controller</li> <li>• Decomposition</li> <li>• Edge connector</li> </ul>	<p><b>All pupils can:</b></p> <ul style="list-style-type: none"> <li>• identify inputs and outputs for their toy</li> <li>• name inputs and outputs for the micro:bit</li> <li>• design an interactive toy</li> <li>• add interactivity to a toy</li> <li>• design a program to control the toy</li> <li>• connect the micro:bit to their interactive toy.</li> </ul> <p><b>Most pupils can:</b></p> <ul style="list-style-type: none"> <li>• compare possible toy designs</li> <li>• program the micro:bit to control their toy</li> <li>• decompose the toy project into a number of stages</li> </ul>
2. Research electronic toys	<ul style="list-style-type: none"> <li>• Remind pupils that computers can be thought of as machines which accept input, process this according to stored instructions</li> </ul>	<ul style="list-style-type: none"> <li>• input and output components</li> <li>• Embedded system:</li> <li>• Input:</li> <li>• Light-emitting diode (LED):</li> <li>• MakeCode</li> </ul>	<ul style="list-style-type: none"> <li>• identify problems with their toy</li> <li>• identify bugs in their program.</li> </ul> <p><b>Some pupils can:</b></p>



	<ul style="list-style-type: none"> <li>• Demo how the micro:bit can be attached used to detect movement/ motion/ magnetism</li> <li>• Children explore this and connecting it to a speaker.</li> <li>• Think about electronic toys from their childhood/ along with amazon existing products – identify inputs/ outputs</li> </ul>	<ul style="list-style-type: none"> <li>• micro:bit</li> <li>• Microprocessor</li> <li>• Output</li> <li>• Simulator</li> </ul>	<ul style="list-style-type: none"> <li>• use criteria to evaluate possible toy ideas</li> <li>• identify risks in the project and suggest ways to mitigate these</li> <li>• take a lead in managing the project with a partner or in their group</li> <li>• fix problems they encounter</li> <li>• debug mistakes in their program</li> <li>• provide constructive feedback to others using agreed criteria.</li> </ul>
<p>3. Design the toy</p>	<ul style="list-style-type: none"> <li>• Show pupils some examples of how they could make a toy interactive, for example a toy that plays ‘Happy Birthday’ when it is squeezed, or one whose eyes light up when a magnet is moved close to it.</li> <li>• Give pupils time to work with their partner or group to create as many different ideas for making their toy interactive as they can.</li> <li>• Pupils created detailed design /plan of how their toy will use the micro:bit as the toy’s programmable controller, and only have a limited range of electronic components</li> </ul>		
<p>4. Programme MICRO:bit</p>	<ul style="list-style-type: none"> <li>• Pupils explain clearly their inputs and outputs for their toy.</li> <li>• They use block editor in MakeCode, in pairs to create their program.</li> <li>• Pupils test their program using the on-screen simulator to</li> </ul>		



	<p>make sure it works at each stage as they develop it. – Debug any issues</p>	
<p>5. Prepare toy for adding interactive components</p>	<ul style="list-style-type: none"> <li>• Pupils add input sensors and any output devices to their toy, and find room for the micro:bit and its battery, as well as any connecting cables.</li> <li>• They decide: How will they make their toy safe? How will they be able to replace the battery or reprogram the micro:bit? What fasteners could they use to provide access to the inside of the toy?</li> <li>• pupils are shown how to break the projects down into smaller, more manageable parts is known as decomposition, an important part of computational thinking</li> </ul>	
<p>6. Connect the micro:bit to the toy and ensure code is working</p>	<ul style="list-style-type: none"> <li>• Pupils download their code from the MakeCode site to their micro:bit, or if using Scratch, to connect their micro:bit via Bluetooth to their laptop or tablet. 3</li> <li>• Have pupils attach the micro:bit battery and temporarily attach any additional components to their micro:bit, such as speakers, switches or LEDs</li> <li>• Present to class their finished toy and evaluate</li> </ul>	



**Curriculum Area: Computing – Autumn HT2 - 6.2 We are Computational Thinkers**

In this unit, pupils will learn to:

- develop the ability to reason logically about algorithms
- understand how some key algorithms can be expressed as programs
- understand that some algorithms are more efficient than others for the same problem
- understand common algorithms for searching and sorting a list.

Progression:

In Key Stage 1:

- Pupils thought about recipes as sequences of instructions in Unit 1.2: We are TV chefs.
- Pupils thought about the sets of rules for some simple computer games in Unit 2.2: We are game testers.

In Key Stage 2:

- Pupils used logical reasoning to detect and correct errors in programs in Unit 3.2: We are bug fixers.
- Pupils were introduced to the idea of a graph linking locations in an interactive adventure game in Unit 5.5: We are adventure gamers.
- Pupils are introduced to some of the algorithms for machine learning and other aspects of artificial intelligence in Unit 6.6: We are AI developers.

Pupils will learn	Skills/Implementation	Vocabulary Children Will Learn	Assessment (Impact) - By the end of this Unit:
Session 1 - Pupils find the shortest route between towns	<ul style="list-style-type: none"> <li>● Pupils use google maps to find a route from their school to a familiar location, such as a shop in the local town centre</li> <li>● Compare the journey for car/ walk /cycle/ rail</li> <li>● How do you know it is the fastest?</li> <li>● Look on physical map and decide-write an algorithm for this</li> <li>● Understand Google uses divide and conquer method to break down one journey into individual shorter ones.</li> </ul>	<ul style="list-style-type: none"> <li>● Abstraction</li> <li>● Algorithm</li> <li>● Decomposition</li> <li>● Divide and conquer</li> <li>● Graph</li> <li>● Linear search</li> <li>● partitions</li> <li>● elements</li> <li>● Search</li> <li>● Search algorithm</li> <li>● Ranked</li> <li>● Selection sort</li> </ul>	All pupils can: <ul style="list-style-type: none"> <li>● use Google Maps to find the shortest or fastest route between two places</li> <li>● work out the smallest number of coins needed to make an amount of change</li> <li>● use random, linear and binary search to play the 'Guess my number' game</li> <li>● sort yoghurt pots into order with a balance pan, using their own algorithm and quicksort.</li> </ul>
Session 2 - Pupils find the smallest number of coins needed to make change	<ul style="list-style-type: none"> <li>● Ask pupils what different ways there are to make, e.g. 8p, using normal British coins. Which way</li> </ul>	<ul style="list-style-type: none"> <li>● order Sort</li> </ul>	Most pupils can:



	<p>uses the smallest number of coins? (5p, 2p and 1p.)</p> <ul style="list-style-type: none"> <li>Investigate vending machines algorithms for different amounts</li> <li>Explain what a 'greedy algorithm' is and how to decompose</li> <li>Pupils use SCRATCH to code for £1.28, 64p, 32p, 16p, 8p, 4p, 2p and 1p?</li> </ul> <p>*use some real physical coins to help thinking</p>		<ul style="list-style-type: none"> <li>find optimum routes on a simplified map</li> <li>record an algorithm for finding the smallest number of coins to make change</li> <li>record algorithms for random, linear and binary search</li> <li>record an algorithm for sorting                         <ul style="list-style-type: none"> <li>appreciate that quicksort will be faster than, e.g. selection sort.</li> </ul> </li> </ul> <p>Some pupils can:</p> <ul style="list-style-type: none"> <li>find the shortest set of roads to connect towns</li> <li>create a Scratch program to work out the smallest number of coins needed to make change</li> <li>correct Scratch and Snap! programs which implement search and sort algorithms</li> </ul>
<p>Session 3 – Pupils learn about random and linear search algorithm</p>	<ul style="list-style-type: none"> <li>Play guess my number game</li> <li>Pupils in pairs express this as an algorithm</li> <li>Look at both search and linear algorithms in scratch</li> <li>Pupils can explain both and complete one of their own.</li> </ul>		
<p>Session 4 Pupils learn about binary search algorithms</p>	<ul style="list-style-type: none"> <li>Revisit last session and talk about how they could improve their algorithms.</li> <li>Look at binary search and divide and conquer methods.</li> <li>Pupils use these to improve their code.</li> </ul>		
<p>Session 5 Pupils learn about selection sort algorithms</p>	<ul style="list-style-type: none"> <li>Pupils carry out the sort puzzle with set of eight yoghurt pots/Smarties tubes with different weights inside and a pan balance.</li> <li>Pupils challenged is to sort these into weight order.</li> <li>Pupils should work in pairs to think through a possible algorithm</li> </ul>		



	<p>for this challenge. Ask them to record their algorithm, perhaps as a flow chart or as pseudocode</p> <ul style="list-style-type: none"> <li>• Complete the “buggy” sort code on Scratch</li> </ul>		
<p>Session 6 Pupils learn about quicksort algorithms.</p>	<ul style="list-style-type: none"> <li>• Pupils investigate selection sort</li> <li>• Pupils are able to explain which sort they would use for eachj of these and why: Tunes libraries or Spotify by artist or title/library catalogues or search results by author/school class lists by surname or date of birth/search results by relevance. Create own quick sort code in Scratch</li> </ul>		



**Curriculum Area: Computing – Spring 1 – HT3 - 6.3 Creating and Publishing An App**

In this unit, pupils will learn to:

- manage or contribute to large collaborative projects, facilitated using online tools - App Shed
- write and review content
- source digital media while demonstrating safe, respectful and responsible use
- design and produce a high-quality app for their target audience.
  - Consider both positive and negative impacts of Social Media

Progression In Key Stage 1:

- Pupils created an eBook to celebrate achievements in Unit 1.4: We are publishers.
- Pupils researched a topic and presented information in Unit 2.4: We are safe researchers.

In Key Stage 2:

- In Unit 3.5: We are co-authors, pupils collaborated on an eBook.
- In Unit 5.4 We are web developers, pupils collaborated on a website

Pupils will learn	Skills/Implementation	Vocabulary Children Will Learn	Assessment (Impact) - By the end of this Unit:
Sessions 1/ 2 - What are the positive and negative impacts of social media on young people?	<ul style="list-style-type: none"> <li>● Pupils understand what the different social media apps are</li> <li>● Pupils Watch Dove reverse selfie and identify the impacts of influencers</li> <li>● Pupils understand what an influencer is and how they can be positive/negative role models</li> </ul>	<ul style="list-style-type: none"> <li>● App design</li> <li>● Interface</li> <li>● Target audience</li> <li>● Social media</li> <li>● Influencer</li> <li>● Role model</li> <li>● Tabs / Menu</li> <li>● Home screen</li> <li>● Self-image</li> <li>● Filters</li> <li>● Semi-nudes</li> <li>● Peer pressure</li> <li>● Fake news</li> <li>● Tabs</li> <li>● Splash screen</li> <li>● Hyper link</li> <li>● Collaborate</li> <li>● Blockly</li> <li>● Radio button</li> </ul>	<p>All pupils can:</p> <ul style="list-style-type: none"> <li>● Plan and design an app</li> <li>● source content for their pages word-process text</li> <li>● combine words and pictures to create pages</li> <li>● spot and correct errors in content                             <ul style="list-style-type: none"> <li>● Use a colour scheme/ images to appeal to their targdet audience</li> </ul> </li> <li>● Create own jpegs to give key messages</li> </ul> <p>Most pupils can:</p> <ul style="list-style-type: none"> <li>● take responsibility for developing pages for their app</li> </ul>
Session 3 – Planning their app	<ul style="list-style-type: none"> <li>● Children choose their target audience and 3 key messages</li> <li>● Plan their app using wire frame sheet</li> <li>● How will people negotiate it? What will the colour scheme be?</li> <li>● How will they enure key messages are put across?</li> </ul>		





<p>Session 4/5 – Constructing the app</p>	<ul style="list-style-type: none"> <li>Using app shed in pairs pupils plan out who will do what – one person organising info/ images/ one person organising the app tabs</li> </ul>	<ul style="list-style-type: none"> <li>Variable</li> <li>Javascript</li> <li>Colour scheme</li> <li>Iconic</li> <li>Brand</li> <li>Navigate</li> </ul>	<ul style="list-style-type: none"> <li>use collaborative software to plan and create content for their pages</li> <li>word-process text quickly and to a good standard</li> <li>pay attention to principles of good design when designing and creating pages or spreads</li> </ul>
<p>Session 6: Coding a quiz to make the app interactive</p>	<ul style="list-style-type: none"> <li>Pupils decide on the key messages in their app.</li> <li>Use blockly with radio buttons and variables to make the app interactive – test the user with multiple choice questions</li> <li>Pupils download the app using the qr code to test- are there any bugs?</li> </ul>		<ul style="list-style-type: none"> <li>provide constructive, critical feedback to others</li> </ul> <p>Some pupils can:</p> <ul style="list-style-type: none"> <li>take a lead in the development of the app</li> <li>think critically about the quality of content</li> <li>word-process text, taking into account the needs of their audience</li> <li>Add in relevant hyper links/ news articles/ videos to enhance their app                             <ul style="list-style-type: none"> <li>Create a quiz using blockly to test children using their app have learnt the key messages</li> </ul> </li> </ul>



**Curriculum Area: Computing – Spring 2 HT4 - 6. 4 We are Connected**

In this unit, pupils will learn:

- about appropriate rules or guidelines for a civil online discussion
- how search results are selected and ranked
- how to argue their point effectively, supporting their views with sources
- how to counter someone else’s argument while showing respect and tolerance
- how to judge the reliability of an online source
- some strategies for dealing with online bullying.

Progression

In Key Stage 1:

- Pupils learned research skills in Unit 2.4: We are safe researchers.

In Key Stage 2:

- Pupils developed research skills in Unit 3.3: We are presenters.
- The online writing (blogging) skills here build on those from Unit 4.4: We are bloggers.
- Powers of persuasion are developed further in Unit 6.5: We are advertisers

Pupils will learn	Skills/Implementation	Vocabulary Children Will Learn	Assessment (Impact) - By the end of this Unit:
<p>Session 1 Pupils decide on guidelines to follow when debating a controversial topic</p>	<ul style="list-style-type: none"> <li>● Show pupils <a href="https://www.blogger.com/about/?bpli=1">https://www.blogger.com/about/?bpli=1</a></li> </ul> <p>And explain this is the platform they will be using to write a blog giving their point of view about one of a range of controversial topics e.g. Boys are stronger than girls</p> <ul style="list-style-type: none"> <li>● Pupils come up with rules/ guidance for using the blog safely/ respectfully</li> <li>● Demo how to reply to a blog responsibly and what to do if someone doesn't follow these rules</li> </ul>	<ul style="list-style-type: none"> <li>● Anchor tag bias</li> <li>● Blog</li> <li>● Fake news</li> <li>● Hyperlink</li> <li>● Neutral point of view</li> <li>● Online bullying</li> <li>● Plausible</li> <li>● Reliable:</li> <li>● Social media</li> <li>● Source</li> </ul>	<p>All pupils can:</p> <ul style="list-style-type: none"> <li>● suggest rules for conducting an online discussion</li> <li>● search for information on a given topic</li> <li>● write a post on a given topic</li> <li>● comment on others’ posts</li> <li>● consider the plausibility of a source</li> <li>● know who to go to if they are bullied online.</li> </ul>
<p>Session 2 Pupils research the chosen topic, thinking carefully about how to decide whether information is reliable or not</p>	<ul style="list-style-type: none"> <li>● Pupils choose their topic to research</li> <li>● Each time they find info decide what is the source? Is it written from a neutral point of view/ or</li> </ul>		<p>Most pupils can:</p> <ul style="list-style-type: none"> <li>● recognise the importance of respect and tolerance in online discussions</li> </ul>



	<p>bias? Is it plausible? Has it been fact checked.</p> <p>All pupils explain what fake news is.</p>		<ul style="list-style-type: none"> <li>● explain how search results are selected and ranked</li> <li>● write a post on a given topic, justifying their argument</li> <li>● respond to points made in others' posts</li> <li>● evaluate the credibility of a source</li> <li>● suggest what a pupil might do if being bullied.</li> </ul> <p>Some pupils can:</p> <ul style="list-style-type: none"> <li>● establish principles for constructive online debate</li> </ul>
<p>Session 3</p> <p>Pupils argue their own perspective on the topic, backing up their views with relevant sources</p>	<ul style="list-style-type: none"> <li>● Pupils start to write their point of view on the subject chosen</li> <li>● Which persuasive techniques will they use?</li> <li>● Which hyperlinks/ sources will they include to make their argument seem more reliable?</li> <li>● Pupils assess each other's work and spot any weaknesses</li> </ul>		<ul style="list-style-type: none"> <li>● be discerning in evaluating search results</li> <li>● write a carefully argued post on a topic, including hyperlinks to sources</li> <li>● provide a counterargument by highlighting flaws in reasoning or drawing on other sources</li> <li>● suggest how the reliability of a source can be established</li> <li>● appreciate the difference between reasoned argument and bullying.</li> </ul>
<p>Session 4</p> <p>Pupils show respect and tolerance as they respond to others' view</p>	<ul style="list-style-type: none"> <li>● Pupils think of different ways in which they could counter an argument?</li> <li>● For example: ● questioning assumptions ● challenging the evidence ● spotting a gap in the reasoning ● finding a counter-example.</li> <li>● Pupils are paired up and respond to a partner's blog, giving a reasonable/ respectful counter argument – Make rules clear and explicit for this.</li> </ul>		
<p>Session 5</p> <p>Pupils think about how reliable sources of information are</p>	<ul style="list-style-type: none"> <li>● Pupils learn what reliable means</li> <li>● Is it possible that people link to a site as an example of 'fake news' and therefore it gets a high ranking even if it is not true? (See <a href="http://www.thedogisland.com">www.thedogisland.com</a>).</li> <li>● Pupils investigate each of the three stories and determine whether they are fake news or reliable info</li> <li>● Pupils can explain the importance of <a href="http://Full Fact.org">Full Fact.org</a></li> </ul>		



Session 6 Pupils discuss online bullying and how they should respond to it.	<ul style="list-style-type: none"><li>• Pupils discuss whether they liked people replying and disagreeing to their blogs – why?</li><li>• Look at different scenarios – what would they do in each situation ?</li><li>• Pupils make a clear list of what to do if they are bullied online knowing that along side trusted adult/ they can use CEOP/ Childline</li><li>• Pupils complete end of unit quiz.</li></ul>		



Curriculum Area: Computing – Summer 1 – HT5 - 6.5 We are Advertisers			
<p><u>In this unit, pupils will learn:</u> In this unit, pupils will learn to:</p> <ul style="list-style-type: none"> <li>● think critically about how video is used to promote a cause</li> <li>● storyboard an effective advert for a cause</li> <li>● work collaboratively to shoot original footage and source additional content</li> <li>● acknowledge intellectual property rights</li> <li>● work collaboratively to edit the assembled content to make an effective advert.</li> </ul> <p><u>Progression</u> In Key Stage 1:</p> <ul style="list-style-type: none"> <li>● In Unit 1.2: We are TV chefs, pupils filmed the steps of a recipe.</li> <li>● In Unit 2.5: We are animators, pupils created stop-motion films.</li> </ul> <p>In Key Stage 2:</p> <ul style="list-style-type: none"> <li>● In Unit 3.3: We are presenters, pupils recorded performances using green screens.</li> <li>● In Unit 4.6: We are meteorologists, pupils filmed a weather forecast.</li> </ul>			
Pupils will learn	Skills/Implementation	Vocabulary Children Will Learn	Assessment (Impact) - By the end of this Unit:
<p>Session 1 Pupils review existing adverts or promotional films</p>	<ul style="list-style-type: none"> <li>● Brief pupils on the unit, explaining that they will be working in groups to produce their own advert or promotional film</li> <li>● Pupils watch a prepared set of adverts, and try to work out how YouTube selects and ranks the results it displays for any given search query</li> <li>● Pupils identify what made each ad effective</li> </ul>	<ul style="list-style-type: none"> <li>● Creative Commons: licensing scheme where the creator of an original work allows others to use it without seeking further permission, subject to a number of agreed conditions</li> <li>● Export: to save media in a format such that it can be watched, listened to or read by others without access to the editing software used in its production</li> <li>● Final cut: stage of video production in which the footage</li> </ul>	<p><b>All pupils can:</b></p> <ul style="list-style-type: none"> <li>● identify characteristics of effective adverts</li> <li>● contribute to storyboarding their video</li> <li>● shoot video footage</li> <li>● use search tools to find media</li> <li>● import video footage and media into editing software</li> <li>● export a completed advert.</li> </ul> <p><b>Most pupils can:</b></p> <ul style="list-style-type: none"> <li>● use identified characteristics to reflect on their own work</li> <li>● refine their storyboarding</li> </ul>
<p>Session 2 Pupils create a storyboard for an advert or promotional film</p>	<ul style="list-style-type: none"> <li>● Pupils create a storyboard for their film by sketching out the different scenes and shots they will use .</li> </ul>		



	<ul style="list-style-type: none"> <li>• Pupils think about any media they will need and know the 'Basic Camera Shots for Filmmaking'</li> <li>• Plan out group jobs and when/where each scene will be shot</li> </ul>	<p>is in its finished form in the editing software</p> <ul style="list-style-type: none"> <li>• Rough cut: stage of video production in which scenes and shots are assembled in the correct sequence but without the attention to detail needed in the final cut</li> <li>• Rushes: unedited footage from a video recording</li> <li>• Storyboard: planning document for video or animation in which each scene, or sometimes shot, is draw</li> </ul>	<ul style="list-style-type: none"> <li>• shoot high-quality video footage</li> <li>• think critically about other media they could use</li> <li>• assemble a rough cut of their footage</li> <li>• use advanced features of editing software</li> <li>• appreciate the difference between media, project files and exported movies.</li> </ul> <p><b>Some pupils can:</b></p> <ul style="list-style-type: none"> <li>• appreciate the connection between storyboarding and algorithms</li> <li>• lead their team</li> <li>• appreciate the need to observe licence terms and conditions</li> <li>• consider audience and purpose when using editing software</li> <li>• understand the trade-off between quality and file size in video formats.</li> </ul>
<p>Session 3</p> <p>Pupils shoot original footage for an advert or promotional film</p>	<ul style="list-style-type: none"> <li>• Pupils familiarise themselves with with shooting different angles/ landscape/ portrait shots on the ipad -review and discuss</li> <li>• Begin to film scenes</li> </ul>		
<p>Session 4</p> <p>Pupils source other media and consider copyright</p>	<ul style="list-style-type: none"> <li>• Pupils discuss how they would feel if others were to copy their work without permission.</li> <li>• Explain copyright laws</li> <li>• Look at creative commons licences material – pupils select media from this that they will use in their work</li> </ul>		
<p>Session 5</p> <p>Pupils create a rough cut of an advert or promotional film</p>	<ul style="list-style-type: none"> <li>• Pupils begin to put their scenes together as a rough cut using Imovie or windows movie maker</li> <li>• Pupils review this against their original storyboard and add in other media including still images</li> </ul>		
<p>Session 6</p> <p>Pupils make improvements to create a final cut.</p>	<ul style="list-style-type: none"> <li>• Pupils review their rough cut then use more advanced features including effects/ filters and transitions to create a final cut</li> <li>• Pupils export their video</li> </ul>		



**Curriculum Area: Computing – Summer 2 – HT6- 6.6 We are AI Developers**

In this unit, pupils will learn:

- how decision trees can be trained automatically to classify data
- how speech recognition works
- how a neural net recognises images
- to train a neural net to classify images
- to train a machine learning system to identify sentiments
- to consider some ethical principles in designing AI systems.

Progression In Key Stage 1:

- Pupils encountered classification trees and image recognition in Unit 2.6: We are zoologists.

In Key Stage 2:

- Pupils encountered the self-driving car Scratch program in Unit 3.2: We are bug fixers.
- Some pupils may have made use of speech recognition in Unit 6.3: We are publishers.

Pupils will learn	Skills/Implementation	Vocabulary Children Will Learn	Assessment (Impact) - By the end of this Unit:
Session 1 Pupils construct decision tree classifiers	<ul style="list-style-type: none"> <li>● Pupils explain that artificial intelligence is when computers do things that need intelligence when humans do them, for example, learning</li> <li>● Pupils sort Italian food from pictures using the decision tree</li> <li>● Pupils use Slice of ML website to sort data into test set and training set</li> </ul>	<ul style="list-style-type: none"> <li>● Artificial intelligence</li> <li>● Classifier</li> <li>● Decision tree</li> <li>● Image recognition:</li> <li>● Label</li> <li>● Layer:</li> <li>● Machine learning:</li> <li>● Model</li> <li>● Natural language processing: Neural network</li> </ul>	All pupils can: <ul style="list-style-type: none"> <li>● create a decision tree classifier</li> <li>● use a speech recognition system</li> <li>● take part in a simulation of a neural network</li> <li>● use an image recognition system</li> <li>● train a text classifier</li> <li>● modify a program to automate user action.</li> </ul>
Session 2 Pupils use speech recognition	Pupils discuss their experience of using Google/Syri/Alexa Pupils use google docs and try speech typing Pupils identify how speech recognition could be used in Scratch – use voice to control a sprite	<ul style="list-style-type: none"> <li>● Node</li> <li>● Sentiment analysis</li> <li>● Spectrogram</li> <li>● Speech recognition</li> <li>● Test data</li> <li>● Training data</li> </ul>	Most pupils can: <ul style="list-style-type: none"> <li>● train a machine learning decision tree classifier</li> <li>● use speech recognition in their own programs</li> <li>● explain the role of input nodes</li> </ul>



<p>Session 3 Pupils simulate a neural net</p>	<ul style="list-style-type: none"> <li>• Pupils play the picture game to understand how nodes and layers work together in a network.</li> <li>• Pupils understand as the activity is repeated/ questioning is sharpened and the neural network improves</li> </ul>	<ul style="list-style-type: none"> <li>• Watson</li> </ul>	<ul style="list-style-type: none"> <li>• train their own image recognition classifier</li> <li>• use a text classifier in their own programs</li> <li>• debate some ethical implications of AI.</li> </ul>
<p>Session 4 Pupils use image recognition</p>	<ul style="list-style-type: none"> <li>• Pupils gather a small number of objects for pupils to train their computer to recognise - then pupils upload images to Vision API</li> <li>• Model for pupils creating an image recognition model</li> <li>• Pupils make their own</li> </ul>		<p>Some pupils can:</p> <ul style="list-style-type: none"> <li>• understand the difference between training and test data</li> <li>• explain how machine learning distinguishes between phonemes</li> <li>• understand how neural networks use feedback to learn</li> </ul>
<p>Session 5 Pupils explore sentiment analysis</p>	<p>Pupils create a model to use in the Scratch program at <a href="http://machinelearningforkids.co.uk">machinelearningforkids.co.uk</a> which has a three-stage process of training. Pupils investigate machine learning models and explain how WATSON (IBM) works</p>		<ul style="list-style-type: none"> <li>• use image recognition in their own programs</li> <li>• add examples or labels to an existing model</li> <li>• articulate ethical principles for AI systems.</li> </ul>
<p>Session 6 Pupils program a self-driving car and consider the ethics of A</p>	<ul style="list-style-type: none"> <li>• Pupils investigate <a href="http://www.bbc.com/news/technology-34066941">www.bbc.com/news/technology-34066941</a> and ask them to explore whether a particular job seems likely to be replaced by machine learning and robotics</li> <li>• Pupils discuss the ethics around self driving cars</li> <li>• Pupils create own self driving car and test it in Scratch .</li> </ul>		