Year 1 Spring Term Computing Concept: Exploring algorithms

National Curriculum Focus: use logical reasoning to predict the behaviour of simple programmes

Builds on knowledge & skills: Inputs and outputs. Computer basics.

Background information

This term the children will be exploring algorithms. They will be able to understand what an algorithm is, create their own algorithms to complete a given task and be able to predict what the outcome of an algorithm will be. To explore this the children will be utilising Beebots. They will begin by creating short algorithms then building up a sequence to achieve a goal. There will be a focus on the language that they are using to be able to programme the Beebot.

Key vocabulary

Word	Definition
Algorithm	A process or set of rules followed by a computer
Sequence	The order of instructions for the computer
Debug	Finding a problem and solving/correcting it
Input	The verb for putting information into a computer
Programme/code	Provide a computer or other machine with coded instructions to complete a task

Key knowledge -

Inputting code	Children will need to understand how to input a piece of code into an app or physical device. Children will need to make sure that they are familiar with the interface of the Beebot app and the Beebot itself.
Being specific with the code	Children will need to understand that when creating an algorithm they will need to make it specific. If it is not specific they will then end up with a piece of code that does not work. Key Questions: *What has this code done?* *If it hasn't worked what could you do instead?* *How could you make your code more specific?*
Being able to adapt/change code	Children will need to understand that they will have to make code for specific reasons. Because of this they should be encouraged to write down code, manipulate physical blocks that represent the code etc. Key Questions: *What worked well before?* *How can we use previous code to adapt to this situation?* *Would what we did last time work here or will we need to try something else?*
Present code in a clear way	When programming the Beebot the children should be able to represent the code in a physical form. This could be through drawing, writing or even ordering premade cards to reflect the code. This will help them when exploring how to debug their code is they make a mistake.

Expected outcomes/ suggested apps/ further resources

Expected outcomes:

- Children can create a basic algorithm to complete a function
- Children can guide a Beebot around a map
- Children can explore the use of the repeat function and explain the benefits of it

Suggested apps

- Beebot app
- Beebots

Further resources

- Beebot maps
- Coding cards (reflecting the input buttons on the top of the Beebot)
- Beebot costumes (If wanting to fit into a story)

Year 2 Spring Term Computing Concept: Coding (scratch jr)

National Curriculum Focus: Understand what algorithms are; how they are implemented as programs on digital devices.

Builds on knowledge & skills: Controlling physical devices (Beebots) using basic code.

Background information

Coding in the curriculum has many different forms, it does not need to be complicated. Scratch jr allows the children to explore code in a basic level. The children will develop their understanding of algorithms to create animations for a purpose. The end result of this module will be the children creating an animation focusing on the life cycle of a plant or a retelling of a familiar story.

Key vocabulary

Word	Definition
Algorithm	A set of instructions in the form of code
Sprite	A programmable object in the application
Command	An instruction the sprite follows
Input	What the user uses to start an algorithm
Output	The final outcome when the algorithm has been run

Key knowledge -

Selecting code	Children should be able to identify the correct code for the algorithm that they are creating. They should be able to identify the different options such movement, sounds, command. Key questions: *How can I make the sprite move across the screen?* *How can we make the sprite make sounds?* *What happens if I select the wrong piece of code?*
Running programmes and debugging	The children should be given the opportunity to run the algorithms that they have created. They will then be encouraged to discuss how the algorithm has run. If the programme has not run they will need to debug it. To do this they will need to identify what has gone wrong in the code and then make adjustments. Compare it to computer games and the patches that they would have to download periodically. Key Questions: *What do you do if your algorithm doesn't do what you want it to do?* *How can you fix the algorithm?* *How will you know if it doesn't work?* *How can you tell if you have been successful in debugging the programme?*
Recording sounds	As the children are producing different animations they can explore the sound tools to make and record sounds. They can also record their voices to include to add to their animations. Key Questions: *What sound is most appropriate?* *What can we include in our sounds?*
Refining code	Refining code is making it the most streamlined as possible. Using the least amount of code pieces to complete the desired outcome. Children to explore the repeat function to repeat movement etc.

Expected outcomes/ suggested apps/ further resources

Suggest programmes:

- Scratch Jr
- Purple mash 2code

Expected outcomes:

- Children can explain algorithms
- Children can produce an algorithm
- Children can explain how to change/manipulate code in an algorithm

Year 3 Spring Term Computing Concept: Search engines

National Curriculum Focus: keeping personal information private, where to go for help and support

Builds on knowledge & skills: Computing basics, using technology safely

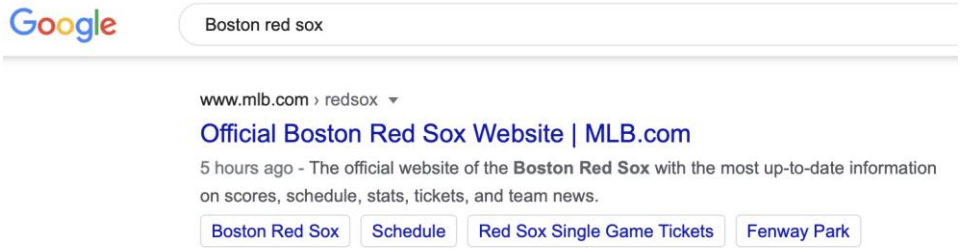
Background information

Search engines are used on a daily basis. The children will be used to using the verb phrase "google it". This unit will focus on the children understanding how they work. This will range from the minute they type in a search to what happens with the search criteria. Aside from understanding how a Search engine works they will be able to create specific searches that will enable them to find the information that they are after quickly. Further to this children will be able to explore the relevance of the searches and how the search engine orders the sites. When the children have grasped this they will be using search engines to find facts and information to answer given questions about the Anglo Saxons and Vikings.

Key vocabulary

Word	Definition
Search	The act of looking for something
Hit	The links that are brought up during a search
Server	A computer that manages access to a network
Relevance	Closely connected or appropriate to what has been searched
Order	The arrangement of things
Googlewhack	A search term consisting of two words that produces a single result when entered into the Google search engine (can be an interesting investigation)

Key knowledge -

Understanding how a search engine works	Lots of different opportunities to show this practically. https://youtu.be/BNHR6IQJGZs This video explains how a search engine works. This can be used to facilitate a lesson to promote understanding of Search engines
Constructing a good search	Children will be able to explore ways of creating specific searches that will allow them to
Identifying the relevance of a search	Children will be able to identify whether the result from a search is relevant or not. They will be looking at the following: Extract of text, weblink and title of the result. This information will allow them to select results that will be most relevant for their search. 
Copyright	Children will be able to identify the different forms of copyright. They will be able to understand that if they were to use a piece of information that they have found online then they have to make sure that the person is given credit. They will need to explore the correct ways of giving the creator credit.

Expected outcomes/ suggested apps/ further resources

Expected outcomes:

- Children can explain how search engines work
- Children can create a search that brings up a good result
- Children can explain copyright and put it into practice
- Children can identify relevant links that will be appropriate for their search
- Children can search a given topic

Suggested apps:

- Google
- Kidrex
- Bing

Further resources:

- Be internet legends pack for e-safety

Year 4 Spring Term Computing Concept: Presentation tools

NC focus: Select and a variety of software on a range of digital devices to design and create content to accomplish given goals

Builds on knowledge & skills: cursor control, typing skills, formatting of images

Background information

Presentation tools have been used for a long time and come in many different forms. The most familiar and widely used presentation tool is MS Powerpoint. There are many other examples such as google slides, keynote, prezy and many more. The children will be using their understanding of typing and cursor control to create a presentation on the Victorian age. They will be using a range of multimedia to make the presentation clear.

Key vocabulary

Word	Definition
Animations	Ways of manipulating text and images on a slide
Text boxes	Option to draw a box where text will be put onto the slide
Pictures	Images to support information on the slide
Slide transition	The way slides go into one another
Slide	The “blank canvas” where all media is placed within a slideshow

Key knowledge -

Text box	This is to be drawn on the slide using the text box tool. This will be the only way to include text on a slide. This text box can then be resized and moved around to make sure that the information is in the most suitable place.
Image insertion	Images can be imported into a slide. They can come from the users drive of images or copied from the internet. All images select from an online source need to be credited to comply with copyright.
Animations	These are applied to individual parts of a slide. They can be in the form of simple options that make text appear all the way to text appearing and then flying about the screen. Children should explore these to see what is most beneficial for their audience. Do they need the text to swing about or can the text just appear?

Expected outcomes/ suggested apps/ further resources

Expected outcomes:

- Children will be able to input information into a text box
- Children will be able to select images to support writing
- Children will be able to choose appropriate animations
- Children will be able to present their information to an audience

Suggest apps:

- Google slides
- Powerpoint
- Key note

Further resources:

- Formula banks printed off
- Diagrams of the different parts of a slideshow

Year 5 Spring Term Computing Concept: Creating and sustaining a blog

National Curriculum Focus: keeping personal information private, where to go for help and support

Builds on knowledge & skills: word processing skills, safe online searches, manipulation of digital images.

Background information

Blogs are a feed of information that is hosted on a website. Some of the popular blogs are inclusive of: Reddit, tumblr, weebly etc. Twitter is another blogging website that is referred to as a microblog as it only allows the user a set amount of characters to write what they want to. Children will be more familiar with video blogging sites such as Youtube. The children will explore reasons for blog creation and why it is important to sustain it so that readers keep coming back. It is crucial that the children are made aware of the risks and responsibilities the children have when producing content. They also need to be aware that their own personal blogs contribute to their digital footprint that can be very hard to get rid of.

Key vocabulary

Word	Definition
Blog	A regularly update website or page that is typically run by an individual or small group
Repost	A message or link that has been posted again. It can be a post or link from the user or from another blogger or source
Vlog	A personal website or account where a person regularly posts short videos
Troll	Someone who posts negative/hateful/hurtful comments with the intention of upsetting either the host of the blog or people reading it
Avatar	An icon or figure representing a person online
Comments	What people can write underneath a blog or vlog
Content	What someone puts into their blog or vlog. This is normally based on a given topic
Feed	A stream of posts/thoughts on a given topic
Hyperlink	A link that when clicked directs the user to another page
Meme	A normally humorous image that has been given a caption that maybe out of context with the aim of commenting on something that socially or culturally relevant

Key knowledge -	
Suitable content	Children need to be able to create a blog that is suitable for their age. They need to have enough of an interest to sustain the post. When creating this they need to consider their audience and to make sure that whatever they create will not be deemed offensive or discriminatory. Key Questions: *Why have you decided to create a blog about…..* *Where could you find information for your blog?* *How do you know the information that you are posting is reliable and true?* *How would you know if your content is suitable?*
Copyright	Children need to know about copyright. They need to understand that if someone else has produced the content be it a video/image etc. they need the users permission to use it or make sure that they give credit to whoever created the content originally. Key Questions: *Where have you found the image? How could you make sure that the person who created it gets the credit for it?*
Drafting posts	This is where the post is created but not posted. It gives the children the opportunity to look at what they have created and can refine the content before posting it at a different time.
E-safety implications	When creating the blogs the children need to be made aware of the following: Trolling Reporting comments that are inappropriate Moderating the comment section Sharing personal information Sharing photos/videos and implications this could have Refer to the pages in the google legends lesson pack for additional resources.

Expected outcomes/ suggested apps/ further resources
Expected outcomes: Weekly updated blog Management of comments Uploading images and giving copyright Explanation of how to identify false information and the importance of uploading content deemed appropriate Suggested apps: 2bloggy (found in J2e) Further resources: Be internet legends e-safety lessons (curriculum books have the content for this including lesson plans and resources) CEOP website for further information about the apps that the children may be using outside of school

Year 6 Spring Term Computing Concept: Coding for a purpose

NC focus: Design write and debug programmes that accomplish specific goals, controlling simulated physical systems and solving problems through decomposition
Use technology safely, respectfully and responsibly

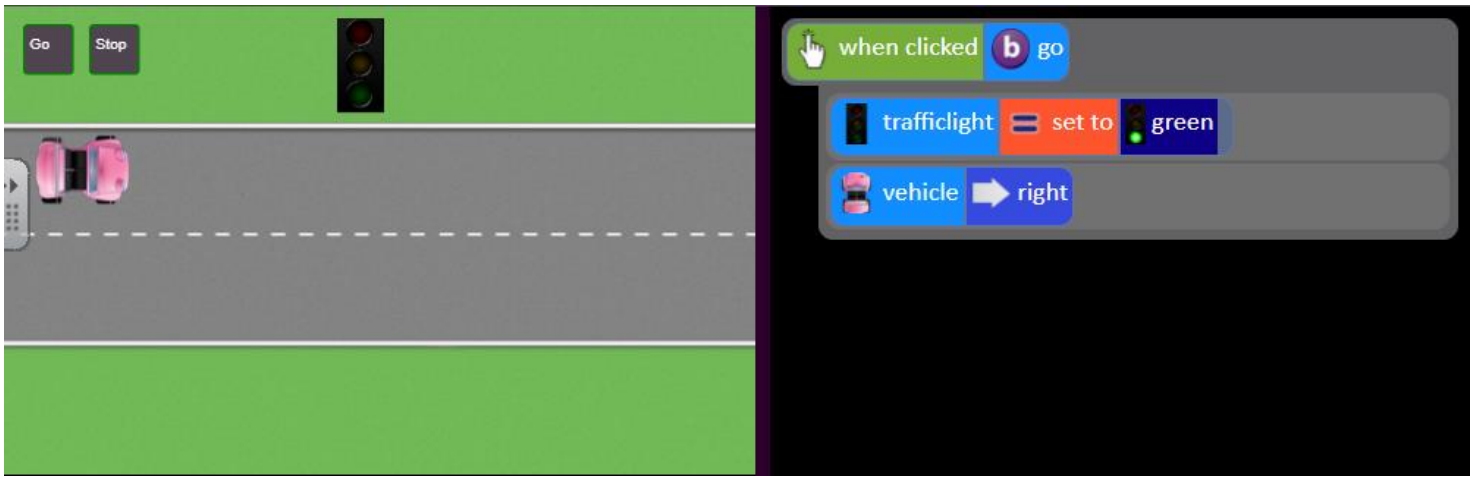
Building on previous skills and knowledge:
Planning, writing and debugging a piece of code.
Using logic and reasoning to predict the outcome for a piece of code.

Background information

During the Spring term the children will be applying their understanding of code in a different situation. They will be exploring the code that is used for a traffic light system. This context will help develop the children's understanding of the practical elements of coding. Through testing and debugging they will be able to create a comprehensive traffic light system.

Key vocabulary

Word	Definition
Algorithm	A string of code that when run completes a specific task
Run/test	Launch the algorithm to observe how it works
Debug	To go find errors and correct them
Refine	Exploring the created code and simplify if required to meet the same end goal
Implement	Identify the code is complete and put into the real world



Key knowledge -

Research	Children should be made aware of the way traffic lights work. They need to be aware that most traffic lights are on a timer. Some traffic lights are not operated with a sensor to allow the flow of traffic to remain steady. Children need to know the sequence of a traffic light
Running and testing	The children need to understand that they will need to continuously test their code to make sure that there are no errors. They need to know what is expected to be seen so that they can identify any errors.
Setting timers	Children will need understand the real life implications of traffic lights. What happens if the lights are on green for too long on one side? What if they are on a very short timer? Etc.
Debug	If the code does not work they will need to make sure that they read their code so that they can then adapt it to make sure it works better.
Sign off/implement the code	The children will need to be confident that their code works. When this has been done they will then need to write a statement explaining that they are confident that they know that the code works and the traffic lights will be safe for all road users. Make links to real life situations.

Expected outcomes/ suggested apps/ further resources

Expected outcomes

- Children are able to research traffic lights
- Children are able to design and create a working set of traffic lights
- Children to create a statement explaining how they know that their traffic lights will keep people safe

Suggested apps

- Purple mash: 2code

Further resources

- Design sheets (found on purple mash)
- Examples of the different traffic lights