



Hayfield Lane Primary School

Computing Curriculum Overview

At Hayfield Lane, all teaching and learning in computing is connected to three key themes



Problem solving and logical thinking



Creative Content



Digital Literacy

Generative Learning in Computing at Hayfield Lane

Theme: *Problem solving and logical thinking*

Our aim is for pupils to have the opportunity to develop computational or logical thinking by being challenged to break down larger problems into smaller solvable sub-problems throughout the curriculum. For the children to be able to solve known and unknown problems through repeated practice and for them to be able to implement solutions through practical programming.



EYFS

Completes a simple program on a computer

With support, to record simple routes

With support, to be able to programme a simple robot to navigate a course

Use ICT hardware to interact with age-appropriate computer software

Children may refer to how they get to and from school or how they navigate a course set up by staff for them to complete on foot or bicycle. They could have support to programme a device to move a set distance.

Year 1

Understand what an algorithm is

Create a simple series of precise and unambiguous instructions - left and right

Record a route

Understand and use forwards, backwards, up and down

Children could independently programme a robot to complete a route using directional language. They could create a simple dance move in PE that involves the directional language above that they could share with others. Use Purple Mash Unit 1.7 lessons and slides as guidance for coding.

Year 2

Use logical reasoning to predict the outcomes of a set of instructions

Program using sequences of instructions to implement an algorithm

Create and debug a simple algorithm

Test and amend a set of instructions

Children build on previous learning by predicting the events within a series of instructions that are not correctly structured. What will the consequence be of the instructions being incorrectly written? For example, they could write out instructions for their partner to make a healthy snack before getting their partner to test to see if what is written can be followed through – use Purple Mash Unit 2.1 lessons and slides as guidance as well as creating and sequencing a composition using 2Sequence. Within maths, they could predict what the next number in a sequence will be by identifying the pattern.

Year 3

Experiment with variables to control models

Input directional instructions *eg online robots*

Design and write more complex programs - leading to varying outcomes

Understand input and output

Explore using commands to sequence and repeat for a desired outcome - *eg drawing shapes on screen*

Children begin to use commands within written instruction so that the language being used is more precise for the audience. They complete function machine problems in maths to introduce the language before comparing what an input device is in relation to computing such as mouse, camera or keyboard and then considering what the output would therefore be. Year 5 will lead a video chat with the year group to test the children's knowledge and clarify any misconceptions. They experiment with variables to solve problems such as trying to identify missing numbers in calculation problems or experimenting with how far an object will move after being programmed on screen. Using Purple Mash 3.1 sessions, the children learn to control an online robot that represents a Roman soldier to avoid obstructions so that they can reach their destination.

Year 4

Use repeated instructions to draw a desired outcome using commands

Experiment with variables to control models

Make turns using specifying the degrees

Make accurate predictions about outcomes of a program they have written with a specific goal in mind

Give a robot/online robot specific directional instructions that take them from X to Y

Within curriculum work, the children could be challenged to crack codes by looking for patterns within ones that they have been given. In maths, they need to measure angles accurately and can move specified degrees. They could have challenges within PE where they need to navigate their partner through a series of obstacles. This can then be replicated on a smaller scale with robots. The children could learn about strategies to use repeated instructions by exploring the chorus within a piece of music before experimenting with an online programme by grouping a set of instructions together in a repeated format instead of rewriting each time. Using Purple Mash 4.1 sessions, the children learn to control using variables as well as X and Y positioning as well as Purple Mash 4.5 - Logo.

Year 5

Combine sequences of instructions and procedures to turn devices on or off

Understand and use input and output

Plan a solution to a problem using decomposition

Children will be using the term decomposition regularly within maths to solve a variety of problems and tasks. This understanding of decomposition will then be transferred into other curriculum areas where the children will be required to solve problems by processing what the problem is before explaining the steps used to complete the task. They could be deciphering a code from WW2. They will plan website pages that explain a specific subject – see Oak Academy Web Page Creation support materials. Building on their knowledge of input and output devices, are asked to produce presentations for Y3 children sharing specific examples. Using programming tools online, children will be challenged to implement solutions that solve specific problems such as a robot stopping as it hits a sensor using Purple Mash 5.1 sessions.

Year 6

Explain how an algorithm works

Detect errors in a program and correct them

Explore 'What if' questions by planning different scenarios for controlled devices

Use input from sensors to trigger events

Design, write and debug their own computer control application

Within curriculum work, the children could be asked to identify the mistakes within mathematical two-step problems by detecting the errors and recognising the steps to find the correct solution. Within history this could look like the children needing to arrange a seating plan for a group of invited guests to be placed without causing confrontation by having them sat in the wrong place. They are challenged to write branching databases within science to classify different species of animal or plant. They explore 'What if' questions by discussing the cause and effect of an action or statement by a character within English before exploring the cause and effect within science when creating circuits by adding bulbs, batteries, motors etc. There will be the need for children at some stage to input instructions into devices to complete specific complex functions such as stopping at a sensor and reversing to a set location – Purple Mash 6.1 session 5 covers this and offers guidance.

Generative Learning in Computing at Hayfield Lane

Theme: *Creative Content*

Our aim is for pupils to have an understanding of the latest technology so that they are confident. For example, being able to create videos, presentations or musical compositions. We also want to ensure that our children recognise how different technology is used within specific sectors to support society.



EYFS

To be able to turn on and off simple technology tools such as CD player, interactive whiteboard or tablets.

With support, capture images using digital devices.

Children may be asked to use digital devices to take photographs of work that they are proud of with an adult pressing buttons to start music or turn off devices. Purple Mash Reception - General Computing Skills folder has supporting materials.

Year 1

Create original content using digital technology

Use digital technology to store, organise and retrieve content

Experiment with drawing tools, texts, pictures and animations to create content - *eg presentations eBooks*

They could use paint programmes to experiment with drawing images or use story making apps to store and organise their ideas Purple Mash unit 1.6 is used to create animated eBooks so that the children can use drawing tools alongside texts.. They could record their opinion about what they have created through a video or take photographs to evidence tasks that they have completed.

Year 2

Find and retrieve information from a website

Use a webpage as a resource

Use with purpose, drawing tools, texts, pictures and animations to create content - *eg presentations eBooks, animations, videos and record the narration*

Children build on previous learning by combining texts and images that they have created using Pic Collage. They will begin to learn how to use search engines to help them retrieve simple information about curriculum topics using Purple Mash unit 2.5 as a guide. When the children learn to communicate effectively with other people online, they will use Purple Mash application 2Email so that they can learn how to alter the font.

Year 3

Use editing software to manipulate media - eg *crop/add effects/ manipulate audio*

Manipulate sound

Combine text, images and sounds and show awareness of an audience

Music is taught through Purple Mash unit 2.7 where the children learn to alter and add effects to the audio. Within English work, the children are challenged to create simple animated stories. They revisit Purple Mash unit 1.6 but extend previous work through greater manipulation of sounds, altering backgrounds and increasing the length of the stories so that they engage more with the audience – select My Adventure Story section of 2Create a Story. They should add voiceover or could use the music that they have composed from unit 2.7. Pic Collage is another tool to utilise when combining text and images and could be used when comparing artists.

Year 4

Capture images using a range of devices - eg *webcams/screen capture/scanning/visualiser/internet*

Select media to download, import and export

Copy graphics from a range of sources and paste into a desktop publishing program

Insert media into a presentation

Manipulate text, underline text, centre text, change font and size, and save text to a folder

Create a presentation that is aimed at a specific audience

Building on presentational knowledge and understanding for an audience from the previous year, the children work through Purple Mash unit 3.9 to understand how to use presentations by using tools like Import and Download to retrieve media that they want to use before inserting it into their work to engage their audience. They will also consider which text types suit their presentation after experimenting with different formats. They will reflect on how to retrieve specific images or videos that they want to use within their work and consider how these can be inserted into their presentation. To ensure that presentations are not lost, children will be taught how to save files in folders including the shortcuts such as Ctrl + S.

Year 5

Listen, download, produce and upload a variety of broadcast media - eg *live streaming / podcasting*

Manipulate sounds using audio editing software

Select music from a variety of sources and incorporate it into multimedia presentations

Work on simple film editing

Use a range of presentation applications

Use technology to capture a range of multimedia

Make a homepage for a website that contains links to other pages

Prepare then present a simple film

Here the children are learning about the creation and processes behind different presentational types such as podcasts and websites. They will create a website about a specific theme that incorporates other presentation devices such as music, images and videos. They will edit music or other audio that they have created by exploring the different editing elements available within the programmes that they use. A film about a specific curriculum area will be produced with some evidence of editing techniques being used to refine elements within the film.

Year 6

Explore the menu options and experiment with images

Add special effects to alter the appearance of a graphic

Save images as a 'save as' gif or jpeg. Wherever possible to make file size smaller (for emailing or downloading)

Make an information poster using their graphics skills to good effect

Present a film/advert for a specific audience

Create a sophisticated multimedia presentation

Building on work from previous year groups, the children will create sophisticated multimedia presentations such as documentaries using programmes like iMovie or musical compositions with Garageband. They will add special effects such as texts or transitions to ensure that they are addressing the needs of their audience. Instead of just adding music or narration to their presentations, the children will be expected to use the editing tools to ensure that what they produce flows smoothly and all audio has the necessary effect and can be clearly heard. They will be given opportunities to critically analyse their work before refining elements in future work. When producing posters, again children will need to consider the use of images to support their message and consider the most suitable text and text type to convey their message. When the children use Purple Mash 2Graph in science, they will use the menu options to experiment with the best way to share the results.

Generative Learning in Computing at Hayfield Lane

Theme: Digital Literacy

Our aim is that our children have enough digital literacy knowledge and understanding so that they are safe and confident users who understand how to operate devices at a mechanical level and can search for information responsibly.



EYFS

To be able to move the cursor on a tablet or whiteboard

To be able to drag and drop content on a screen

Children could complete number recognition games on a tablet by moving the cursor or drag and drop an animation from one position to another on either a tablet or interactive whiteboard. Purple Mash Reception - General Computing Skills folder has supporting materials as does Physical Development folder.

Year 1

Understand appropriate vocabulary according to equipment available

Develop an awareness and use of keyboard layout and use navigation skills appropriately - eg *backspace/enter/spacebar/mouse*

Children can identify where keys such as Enter or Backspace are on a keyboard and explain their function. They understand terms such as video or audio and can explain why they are different. Could use Purple Mash 2Type.

Year 2

Communicate safely online

Create, edit and format text (*insert/delete words/use bold/italics/ underline*)

With support, and building on their knowledge of keyboard functions, the children learn how to format and alter text with buttons such as bold or italics using 2Email from Purple Mash. They will be able to explain how the text has altered and why this could be useful. The children will be shown how to alter the text including shortcuts such as Ctrl + B to bold. Through the communication via 2Email, the children will understand how and why the platform is safe.

Year 3

Open and send an attachment

Find relevant information by browsing a menu

Search for an image, then copy and paste it into a document

Copy and paste text into a document

Begin to manipulate text *(eg underline text, centre text, change font and size)*

Save files to an appropriate folder

Building on their knowledge of email, the children will learn how to open an attachment within an email and how to send an email with an attachment through Purple Mash 2Email. They will be supported to understand functions such as copy and paste as well as how to alter the position of the text. The children will be shown how to use the cursor alter the text but also shortcuts such as Ctrl + V to paste. Once presentations have been completed, the children will learn how to save safely within a folder so that they can retrieve their work swiftly whenever they need it the next time.

Year 4

Identify the benefits of ICT to send messages and to communicate

Use automatic spell checker to edit spellings

Use a search engine to find a specific website

Navigate using an internet browser - *eg use tabbed browsing to open 2 or more web pages at the same time, open a link to a new window*

Having explored some means of online communication in different year groups, the children will discuss the benefits of the different systems and utilise some to send simple messages within a safe platform so that they understand how it is safe, why it is safe and who can see it. As the children are creating their presentations, staff will make them aware of spellchecking technology that can help benefit their understanding but also draw attention to the limitations of the technology and where and when it is appropriate to use. Staff will support pupils with using search engines to find exact websites. These searches can take place using two or more tabs so that the children can see what happens when you are not exact.

Year 5

Conduct a video chat with someone elsewhere in school

Use bullet points and numbering tools

Use a search engine using keyword searches

Compare the results of different searches

Download a document and save it to the computer

Decide which sections are appropriate to copy and paste from at least 2 web pages

Building on previous knowledge students will understand how to be more exact with online searches by using keywords. They will switch between open tabs so that they can compare the results and recognise how different the results can be just through the specifically chosen words. For example, they could search for 'Harry Potter' or 'Harry Potter Philosopher's Stone book' Once on a webpage, they will learn how to save content from that page so that it can be retrieved in the future but also how to copy and paste from a webpage into a document. For example, they might copy and paste two descriptions of Winston Churchill within World War Two topic. They then compare the results and look for similarities and differences. What are the facts? What are the opinions? Why have they been written like this? They would then write their own version without plagiarising either piece. The children will be given opportunities to present what they have learnt to others within school via video chats. So, for example, linking up with Y3 to share what they know about input and output devices after completing the research. Within their presentations, they could have utilised the bullet points or numbering functions to demonstrate how to make more effective use of presentation software – this could also come through the Harry Potter website design.

Year 6

Conduct a video chat with people in another organisation

Contribute to discussions online

Use a search engine using keyword searches

Use complex searches using the such as '+' OR "find the phrase in inverted commas"

Confidently choose the correct page set up option when creating a document

Confidently use text formatting tools, including heading and body text

To ensure that the children are carefully considering how best to present information to their audience they will investigate the range of page set up options available for them so that they can appreciate where and when to use different text formatting tools. For example, the set up for a title page is very different from that of one showing a graph. Also, they may wish to overlay a text box on top of an image to further inform their audience, so staff need to ensure that they are given the opportunity to tackle this. Continuing to build on their knowledge of search online, the children will compare the results from different search engines to understand why and how this happens. They will also learn how to be even more precise with search results by using inverted commas or terms like OR to narrow the parameters. Children will take part in online discussions. Rather than just being passive listeners, they will have the opportunity to ask and answer questions. This could be through author webinars, discussions with experts about a particular topic or sharing what they have learnt with another class.