Pegswood Primary School

Progression Map

Computing

The EYFS framework is structured very differently to the national curriculum as it is organised across seven areas of learning rather than subject areas. The aim of this document is to help subject leaders to understand how the skills taught across EYFS feed into national curriculum subjects.

This document demonstrates which statements from the 2020 Development Matters are prerequisite skills for computing within the national curriculum. The table below outlines the most relevant statements taken from the Early Learning Goals in the EYFS statutory framework and the Development Matters age ranges for Three and Four-Year-Olds and Reception to match the programme of study for computing.

The most relevant statements for computing are taken from the following areas of learning:

- Personal, Social and Emotional Development
- Physical Development
- Understanding the World
- Expressive Arts and Design

Computing		
Three and Four-Year-Olds	Personal, Social and Emotional Development	• Increasingly follow rules, understanding why they are important.
	Physical Development	• Match their developing physical skills to tasks and activities in the setting.
	Understanding the World	• Explore how things work.
Reception	Personal, Social and Emotional Development	• Show resilience and perseverance in the face of a challenge.
	Physical Development	• Develop their small motor skills so that they can use a range of tools competently, safely and confidently. • Know and talk about the different factors that support their overall health and wellbeing: -sensible amounts of 'screen time'.
	Expressive Arts and Design	• Explore, use and refine a variety of artistic effects to express their ideas and feelings.

			Computer Science(Computational Thinking)	Information Technology (Computers and Hardware)	Digital Literacy and Online Safety
			• Children recognise that a range of technology is used in places such as homes and schools. They select and use technology for particular purposes.		
		Understanding the World	Use Logical reasoning to predict the behaviour of simple programs Understand what algorithms are, how they are implemented as programs on digital devices and that programs execute following a sequence of instructions Write simple programs	Organise store and retrieve data in a range of digital formats	Organise store and retrieve data in a range of digital formats Recognise common uses for digital technology beyond the school Keep personal information private.
			Hardware • Learning how to operate a camera to take photographs of meaningful creations or moments • Learning how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary • Learning how to operate a camera • Recognising that a range of technology is used in places such as homes and schools • Learning what a keyboard is and how to locate relevant keys • Learning what a mouse is and developing basic mouse skills such as moving and clicking **Computational Thinking** Using logical reasoning to read simple instructions and predict the outcome	**Using Software** • Using a simple online paint tool to create digital art **Using Email and the Internet** • Participating in group image searches, led by the Teacher **Using Data** • Representing data through sorting and categorising objects in unplugged scenarios • Representing data through pictograms • Exploring branch databases through physical games	•Recognising that a range of technology is used in places such as homes and schools • Learning to log in and log out • When using the internet alongside an adult, or independently, learning what to do if they come across something that worries them or makes them feel uncomfortable

			Programming • Following instructions as part of practical activities and games and learning to debug when things go wrong • Learning to give simple instructions • Learning that an algorithm is a set of instructions to carry out a task, in a specific order • Experimenting with programming a Bee-bot/Bluebot and learning how to give simple commands • Learning to debug instructions, with the help of an adult, when things go wrong		
ELG	Personal, Social and Emotional Development	Managing Self	• Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. • Explain the reasons for rules, know right from wrong and try to behave accordingly.		
	Expressive Arts and Design	Creating with Materials	• Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.		

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Information Technology (Computers and Hardware)	*Children can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems.* **KS1 Computing National Curriculum** Children use technology purposefully to create, organise, store, manipulate and retrieve digital content.		*Children can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems.* **Lower KS2 Computing National Curriculum** Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create […] content that accomplish given goals, collecting, analysing evaluating and presenting data and information Use search technologies effectively		*Children can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems.* **Upper KS2 Computing National Curriculum** Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create […] content that accomplish given goals, collecting, analysing evaluating and presenting data and information Use search technologies effectively	
	Using software • Using a basic range of tools within graphic editing software • Taking and editing photographs • Understanding how to create digital art using an online paint tool • Developing control of the mouse through dragging, clicking and resizing of images to create different effects • Developing understanding of different software tools **Using email and the internet** • Participating in group image searches, led by the teacher **Using data** • Representing data through sorting and categorising objects in unplugged scenarios • Representing data through pictograms • Exploring branch databases through physical games Wider use of technology	**Using software** • Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts • Using word processing software to type and reformat text • Using software to create story animations • Creating and labelling images **Using email and the internet** • Searching and downloading images from the internet safely **Using data** • Introduction to spreadsheets • Representing data in tables, charts and pictograms • Sorting data and creating branching databases	**Using software** • Taking photographs and recording video to tell a story. • Using software to edit and enhance their video adding music, sounds and text on screen with transitions **Using email and the internet** *• Learning to log in and out of an email account* *• Writing an email including a subject, 'to' and 'from'* *• Sending an email with an attachment* *• Replying to an Email*	**Using software** • Building a web page and creating content for it • Designing and creating a webpage for a given purpose • Use Google online software for documents, presentations, forms and spreadsheets. • Work collaboratively with others **Using data** • Designing a weather station which gathers and records sensor data **Wider use of technology** • Understanding	**Using software** • Using logical thinking to explore software more independently, making predictions based on their previous experience • Using software programme Sonic Pi to create music • Using the video editing software: to animate • Identify ways to improve and edit programs, videos, images etc. • Independently learning how to use 3D design software package	**Using software** • Using logical thinking to explore software independently, iterating ideas and testing continuously • Using search and word processing skills to create a presentation • Planning, recording and editing a radio play • Creating and editing sound recordings for a specific purpose • Creating and editing videos, adding multiple elements: music,

• Recognising common uses of information technology, including beyond school • Recognising uses of technology beyond school	• Identifying where digital content can have advantages over paper when storing and manipulating data **Wider use of technology** • Learning how computers are used in the wider world	**Using data** • Understanding the vocabulary associated with databases: field, record, data • Learning about the pros and cons of digital versus paper databases • Sorting and filtering databases to easily retrieve information • Creating and interpreting charts and graphs to understand data **Wider use of technology** Understanding the purpose of emails.	that software can be used collaboratively online to work as a team	TinkerCAD **Using email and the internet** • Developing searching skills to help find relevant information on the internet • Learning how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns **Using data** • Understanding how data is collected **Wider use of technology** • Learning what a search engine is	voiceover, sound, text and transitions to create a video advert • Using design software TinkerCAD to design a product • Creating a website with embedded links and multiple pages **Using email and the internet** • Understanding how search engines work **Using data** • Understanding how barcodes, QR codes and RFID work • Gathering and analysing data in real time • Creating formulas and sorting data within spreadsheets **Wider use of technology** • Learning about the Internet of Things and how it has led to 'big data'. • Learning how 'big data' can be used to solve a problem or improve efficiency

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	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computer Science (Computational Thinking)	*Children can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation.* *Children can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems.* **National Curriculum Key Stage 1** Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions Create and debug simple programs Use logical reasoning to predict the behaviour of simple programs		*Children can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation.* *Children can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems.* **National Curriculum Lower Key Stage 2** 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 Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web Appreciate how [search] results are selected and ranked		Children can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation. Children can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems. **National Curriculum Upper Key Stage 2** 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 Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web Appreciate how [search] results are selected and ranked	
	Hardware • Learning how to explore and tinker with hardware to find out how it works • Understanding that computers and devices around us use inputs and	Hardware • Understanding what a computer is and that it's made up of different components • Recognising that buttons cause effects	Hardware • Understanding what the different components of a computer do and how they work together • Drawing comparisons across different types of computers	Hardware • Learning about the purpose of routers Networks and data representation • Consolidating understanding of the key components of a network	Hardware • Learning that external devices can be programmed by a separate computer • Learning the difference between ROM and RAM	Hardware • Learning about the history of computers and how they have evolved over time • Using the understanding of

outputs, identifying some of these • Learning where keys are located on the keyboard • Learning how to operate a camera Computational thinking • Learning that decomposition means breaking a problem down into smaller parts • Using decomposition to solve unplugged challenges • Using logical reasoning to predict the behaviour of simple programs • Developing the skills associated with sequencing in unplugged activities • Learning that an algorithm is a set of step by step instructions used to carry out a task, in a specific order • Follow a basic set of instructions • Assembling instructions into a simple algorithm	and that technology follows instructions • Learning how we know that technology is doing what we want it to do via its output. • Using greater control when taking photos with tablets or computers • Developing confidence with the keyboard and the basics of touch typing Computational thinking • Articulating what decomposition is • Decomposing a game to predict the algorithm s used to create it • Using decomposition to decompose a story into smaller parts • Learning what abstraction is • Learning that there are different levels of abstraction • Explaining what an algorithm is • Following an algorithm • Creating a clear and precise algorithm • Learning that computers use	• Learning what a server does Networks and data representation • Learning what a network is and its purpose • Identifying the key components within a network, including whether they are wired or wireless • Recognising links between networks and the internet • Learning how data is transferred Computational thinking • Using decomposition to explain the parts of a laptop computer • Using decomposition to explore the code behind an animation • Using repetition in programs • Understanding that computers follow instructions • Using an algorithm to explain the roles of different parts of a computer • Using logical reasoning to explain how simple algorithms work • Explaining the purpose of an algorithm	• Understanding that websites & videos are files that are shared from one computer to another • Learning about the role of packets • Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration Computational thinking • Solving unplugged problems by decomposing them into smaller parts • Using decomposition to understand the purpose of a script of code • Using decomposition to help solve problems • Identifying patterns through unplugged activities • Using past experiences to help solve new problems • Using abstraction to identify the important parts when completing both plugged and unplugged activities • Creating algorithms for a specific purpose Programming	• Recognising how the size of RAM affects the processing of data • Understanding the fetch, decode, execute cycle Networks and data representation • Learning the vocabulary associated with data: data and transmit • Learning how the data for digital images can be compressed • Recognising that computers transfer data in binary and understanding simple binary addition • Relating binary signals (Boolean) to the simple character-based language, ASCII • Learning that messages can be sent by binary code, reading binary up to 8 characters and carrying out binary calculations • Understanding how bit patterns represent images as pixels Computational thinking Decomposing animations into a series of images • Decomposing a program without support • Decomposing a story to be able to plan a program to tell a story	historic computers to design a computer of the future • Understanding and identifying barcodes, QR codes and RFID • Identifying devices and applications that can scan or read barcodes, QR codes and RFID • Acknowledging that corruption can happen within data during transfer (for example when downloading, installing, copying and updating files) Networks and data representation • Understanding that computer networks provide multiple services Computational thinking Decomposing a program into an algorithm • Using past experiences to help solve new problems

algorithms to make predictions • Learning that programs execute by following precise instructions • Incorporating loops within algorithms	• Forming algorithms independently Programming • Using logical thinking to explore more complex software; predicting, testing and explaining what it does • Incorporating loops to make code more efficient • Remixing existing code • Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected	• Understanding that websites can be altered by exploring the code beneath the site • Coding a simple game • Using abstraction and pattern recognition to modify code • Incorporating variables to make code more efficient • Remixing existing code • Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected	• Predicting how software will work based on previous experience • Writing more complex algorithms for a purpose Programming • Programming an animation • Iterating and developing their programming as they work • Beginning to use nested loops (loops within loops) • Debugging their own code • Writing code to create a desired effect • Using a range of programming commands • Using repetition within a program • Amending code within a live scenario	• Writing increasingly complex algorithms for a purpose Programming • Debugging quickly and effectively to make a program more efficient • Remixing existing code to explore a problem • Using and adapting nested loops • Programming using the language Python • Changing a program to personalise it • Evaluating code to understand its purpose • Predicting code and adapting it to a chosen purpose • Altering a website's code to create changes

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Online Safety	Children begin to consider their activity on the internet and learn about ways to keep themselves safe and why it is important to do so. They also compare appropriate and inappropriate activity on the internet and decide what to do next. **KS1 Computing National Curriculum** Children can use technology safely and respectfully, keeping personal information private. Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.		Children develop their skills of formatting using keyboard commands, organising their work to demonstrate effect. In LKS2, they will have the opportunity to express themselves more through digital technology, art, PowerPoint and posters. Children should continue to demonstrate control when operating tools as in KS1. **Lower KS2 Computing National Curriculum** Use technology safely, respectfully and responsibly. Recognise acceptable/unacceptable behavior. Identify a range of ways to report concerns about content and contact		Children are encouraged to identify online risks and share their knowledge of the risks and consequences for people online. They begin to think more critically about what they see online and look at the concept of fake news and false photographs. **Upper KS2 Computing National Curriculum** Children use technology safely, respectfully and responsibly. Recognise acceptable/unacceptable behavior. Identify a range of ways to report concerns about content and contact.	
	• I can explain what online information is • I know what is safe to share online • I know who to talk to if something is shared that makes me feel sad or worried • I know what passwords are for • I can explain how to create a strong password • I know what information is private and can explain how I can keep this private • I understand why I ask permission • I can explain who I need to ask permission from before sharing content online • I can explain people's feelings if I share things online without their permission • I can explain why I have the right to say no • I know who to ask for help if I am unsure or feel pressure to do something • I can explain why I need to ask a trusted adult before clicking 'accept'		• I can describe how to search for information on search engines, social media and image and video sites • I can make judgments about the accuracy of the information I am presented with • I can describe some methods used by companies such as 'in-app purchases' and 'pop-ups' • I can recognise some of these when they appear • I can think about ways to avoid purchases • I can explain the difference between facts, opinions and beliefs • I can explain what a 'bot' is • I can provide examples of bots • I can describe the benefits and the risk of using bots now and in the future • I can explain how technology can be both a positive and negative distraction • I can recognise the amount of time I spend on technology • I can suggest strategies to help limit time spent on technology		• I can understand the importance of keeping passwords safe • I can identify that passwords are needed for access to 'apps' • I can explore how apps require permission to access private information • I know how to alter the permissions apps require • I can understand different types of online communication • I am aware of some of the different types of online communication • I can recognise the positive and negative forms of online communication • I can understand why people search personal information about others online • I know how to search for personal information about others online • I can form opinions about the reliability of the information about a person	

	• I understand the terms safe and respect • I know ways to keep myself safe online • I can give examples of how to be respectful online • I can explain why content shared by somebody may be important to them	• I can recognise differences between online and offline bullying • I can describe some of the differences between online and offline bullying • I can identify ways to help those being bullied online • I can recall organisations and people who can help with online bullying issues • I can identify the advantages and disadvantages technology has to health (mental and/or physical) • I can research advice and ways to support others with their online health and wellbeing • I know where I can go to for support if my wellbeing is being negatively affected by technology

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Digital Literacy and Online Safety	*Children are responsible, competent, confident and creative users of information and communication technology.* **KS1 Computing National Curriculum** Recognise common uses of information technology beyond school. Use technology safely and respectfully, keeping personal information private. Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.		*Children are responsible, competent, confident and creative users of information and communication technology.* **Lower KS2 Computing National Curriculum** Understand the opportunities [networks] offer for communication and collaboration. Be discerning in evaluating digital content. Use technology safely, respectfully and responsibly. Recognise acceptable/unacceptable behavior; identify a range of ways to report concerns about content and contact.		*Children are responsible, competent, confident and creative users of information and communication technology.* **Upper KS2 Computing National Curriculum** Understand the opportunities [networks] offer for communication and collaboration. Be discerning in evaluating digital content. Use technology safely, respectfully and responsibly. Recognise acceptable/unacceptable behavior; identify a range of ways to report concerns about content and contact.	
	• Logging in and out and saving work on their own account • Understand the importance of a password • When using the internet to search for images, learning what to do if they come across something online that worries them or makes them feel uncomfortable	•Understanding how to stay safe when talking to people online. Not sharing personal information and what to do if they see or hear something online that makes them feel upset or uncomfortable	• Learning to be a responsible digital citizen; understanding their responsibilities to treat others respectfully and recognising when digital behaviour is unkind • Learning about cyberbullying • Learning that not all emails are genuine, recognising when an email might be fake and what to do about it	• Recognising what appropriate behaviour is when collaborating with others online • Recognising that information on the Internet might not be true or correct and that some sources are more trustworthy than others	• Identifying possible dangers online and learning how to stay safe. • Creating an animation about digital safety • Recognising that information on the Internet might not be true or correct and learning ways of checking validity • Learning to use an online community safely	• Understanding the importance of secure passwords and how to create them • Using search engines safely and effectively • Recognising that updated software can help to prevent data corruption and hacking