



## The Stonebridge School

### Computing Progression Map

| EYFS   | Year 1   | Year 2   | Year 3  | Year 4   | Year 5   | Year 6   |
|--|--|--|---|--|--|--|
| <b>Hardware</b>  |  |  |   |  |  |  |
| <p>Learning how to operate a camera to take photographs of meaningful creations or moments.</p> <p>Learning how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary.</p> <p>Recognising and identifying familiar letters and numbers on a keyboard.</p> <p>Developing basic mouse skills such as moving and clicking.</p> | <p>Learning how to operate a camera or tablet to take photos and videos.</p> <p>Learning how to explore and tinker with hardware to find out how it works.</p> <p>Recognising that some devices are input devices and others are output devices.</p> <p>Learning where keys are located on the keyboard.</p> | <p>Understanding what a computer is and that it's made up of different components.</p> <p>Recognising that buttons cause effects and that technology follows instructions.</p> <p>Learning how we know that technology is doing what we want it to do via its output.</p> <p>Using greater control when taking photos with cameras, tablets or computers.</p> <p>Developing confidence with the keyboard and the basics of touch typing.</p> | <p>Understanding what the different components of a computer do and how they work together.</p> <p>Drawing comparisons across different types of computers.</p>   | <p>Using tablets or digital cameras to film a weather forecast.</p> <p>Understanding that weather stations use sensors to gather and record data which predicts the weather.</p> | <p>Learning about the purpose of routers.</p> <p>Learning that external devices can be programmed by a separate computer.</p> <p>Learning the difference between ROM and RAM.</p> <p>Recognising how the size of RAM affects the processing of data.</p> <p>Understanding the fetch, decode, execute cycle.</p>  | <p>Learning about the history of computers and how they have evolved over time.</p> <p>Using the understanding of historic computers to design a computer of the future.</p> <p>Understanding and identifying barcodes, QR codes and RFID.</p> <p>Identifying devices and applications that can scan or read barcodes, QR codes and RFID.</p> <p>Understanding how corruption can happen within data during transfer (for example when downloading, installing, copying and updating files).</p> |
| <b>Networks and data representation</b>  |  |  |   |  |  |  |
|  |  |  | <p>Understanding the role of the key components of a network. Identifying the key components within a network, including whether they are wired or wireless.</p> <p>Understanding that websites and videos are files that are shared from one computer to another.</p> <p>Learning about the role of packets.</p> <p>Understanding how networks work and their purpose.</p> <p>Recognising links between networks and the internet. Learning how data is transferred.</p> | <p>Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration.</p>                        | <p>Learning the vocabulary associated with data: data and transmit.</p> <p>Learning how the data for digital images can be compressed.</p> <p>Recognising that computers transfer data in binary and understanding simple binary addition.</p> <p>Relating binary signals (Boolean) to the simple character-based language, ASCII.</p> <p>Learning that messages can be sent by binary code, reading binary up to eight characters and carrying out binary calculations.</p> | <p>Understanding how bit patterns represent images as pixels.</p> <p>Understanding that computer networks provide multiple services.</p>   |



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| Computational Thinking   |  |  |   |  |  |  |
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| Using logical reasoning to understand simple instructions and predict the outcome.   | <p>Learning that decomposition means breaking a problem down into smaller parts.</p> <p>Using decomposition to solve unplugged challenges.</p> <p>Using logical reasoning to predict the behaviour of simple programs.</p> <p>Developing the skills associated with sequencing in unplugged activities. Following a basic set of instructions.</p> <p>Assembling instructions into a simple algorithm.</p> | <p>Articulating what decomposition is.</p> <p>Decomposing a game to predict the algorithms used to create it.</p> <p>Learning that there are different levels of abstraction.</p> <p>Explaining what an algorithm is.</p> <p>Following an algorithm.</p> <p>Creating a clear and precise algorithm.</p> <p>Learning that programs execute by following precise instructions.</p> <p>Incorporating loops within algorithms.</p> | <p>Using decomposition to explain the parts of a laptop computer.</p> <p>Using decomposition to explore the code behind an animation. Using repetition in programs.</p> <p>Using logical reasoning to explain how simple algorithms work.</p> <p>Explaining the purpose of an algorithm.</p> <p>Forming algorithms independently.</p> | <p>Using decomposition to solve a problem by finding out what code was used.</p> <p>Using decomposition to understand the purpose of a script of code.</p> <p>Identifying patterns through unplugged activities.</p> <p>Using past experiences to help solve new problems.</p> <p>Using abstraction to identify the important parts when completing both plugged and unplugged activities.</p> | <p>Decomposing animations into a series of images.</p> <p>Decomposing a program without support.</p> <p>Decomposing a story to be able to plan a program to tell a story.</p> <p>Predicting how software will work based on previous experience.</p> <p>Writing more complex algorithms for a purpose.</p>   | <p>Decomposing a program into an algorithm.</p> <p>Using past experiences to help solve new problems.</p> <p>Writing increasingly complex algorithms for a purpose.</p>  |
| Programming  |  |  |   |  |  |  |
| <p>Following instructions as part of practical activities and games.</p> <p>Learning to give simple instructions.</p> <p>Experimenting with programming a Bee-bot/Blue-bot and learning how to give simple commands.</p> <p>Learning to debug instructions, with the help of an adult, when things go wrong.</p> | <p>Programming a Floor robot to follow a planned route.</p> <p>Learning to debug instructions when things go wrong.</p> <p>Using programming language to explain how a floor robot works.</p> <p>Learning to debug an algorithm in an unplugged scenario.</p>  | <p>Using logical thinking to explore software, predicting, testing and explaining what it does.</p> <p>Using an algorithm to write a basic computer program.</p> <p>Using loop blocks when programming to repeat an instruction more than once.</p>  | <p>Using logical thinking to explore more complex software; predicting, testing and explaining what it does.</p> <p>Incorporating loops to make code more efficient.</p> <p>Continuing existing code.</p> <p>Making reasonable suggestions for how to debug their own and others' code.</p>   | <p>Creating algorithms for a specific purpose.</p> <p>Coding a simple game.</p> <p>Using abstraction and pattern recognition to modify code.</p> <p>Incorporating variables to make code more efficient.</p>   | <p>Programming an animation.</p> <p>Iterating and developing their programming as they work.</p> <p>Confidently using loops in their programming.</p> <p>Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected.</p> <p>Writing code to create a desired effect. Using a range of programming commands.</p> <p>Using repetition within a program.</p> <p>Amending code within a live scenario.</p> | <p>Debugging quickly and effectively to make a program more efficient.</p> <p>Remixing existing code to explore a problem. Using and adapting nested loops.</p> <p>Programming using the language Python.</p> <p>Changing a program to personalise it.</p> <p>Evaluating code to understand its purpose.</p> <p>Predicting code and adapting it to a chosen purpose.</p> |



## The Stonebridge School

### Computing Progression Map

| Using software  |   |  |   |   |  |  |
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| Using a simple online paint tool to create digital art. | Using a basic range of tools within graphic editing software.<br><br>Taking and editing photographs.<br><br>Developing control of the mouse through dragging, clicking and resizing of images to create different effects.<br><br>Developing understanding of different software tools. | Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts.<br><br>Using word processing software to type and reformat text.<br><br>Using software (and unplugged means) to create story animations.<br><br>Creating and labelling images. | Taking photographs and recording video to tell a story.<br><br>Using software to edit and enhance their video adding music, sounds and text on screen with transitions.         | Building a web page and creating content for it.<br><br>Designing and creating a webpage for a given purpose.<br><br>Use online software for documents, presentations, forms and spreadsheets.<br><br>Using software to work collaboratively with others.                         | Using logical thinking to explore software more independently, making predictions based on their previous experience.<br><br>Using software programme Sonic Pi/Scratch to create music.<br><br>Using the video editing software to animate. Identify ways to improve and edit programs, videos, images etc.<br><br>Independently learning how to use 3D design software package TinkerCAD. | Using logical thinking to explore software independently, iterating ideas and testing continuously.<br><br>Using search and word processing skills to create a presentation.<br><br>Creating and editing sound recordings for a specific purpose.<br><br>Creating and editing videos, adding multiple elements: music, voiceover, sound, text and transitions.<br><br>Using design software TinkerCAD to design a product.<br><br>Creating a website with embedded links and multiple pages. |
| Using email and internet searches                       |   |  |   |   |  |  |
|   | Recognising devices that are connected to the internet.<br><br>Searching and downloading images from the internet safely.<br><br>Understanding that we are connected to others when using the internet.   | Searching for appropriate images to use in a document.<br><br>Understanding what online information is.  | Learning to log in and out of an email account.<br><br>Writing an email including a subject, 'to' and 'from.'<br><br>Sending an email with an attachment. Replying to an email. | Understanding why some results come before others when searching.<br><br>Using keywords to effectively search for information on the internet.<br><br>Understanding that information found by searching the internet is not all grounded in fact. Searching the internet for data | Developing searching skills to help find relevant information on the internet.<br><br>Learning how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns.   | Understanding how search engines work  |



## The Stonebridge School

### Computing Progression Map

| Using data   |  |  |  |   |  |   |
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| Representing data through sorting and categorising objects in unplugged scenarios.<br><br>Representing data through physical pictograms.<br><br>Exploring branch databases through physical games. | Understanding that technology can be used to represent data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc.<br><br>Using representations to answer questions about data.<br><br>Using software to explore and create pictograms and branching databases.  | Collecting and inputting data into a spreadsheet.<br>Interpreting data from a spreadsheet.   | Understanding the vocabulary to do with databases: field, record, data.<br><br>Learning about the pros and cons of digital versus paper databases.<br><br>Sorting and filtering databases to easily retrieve information.<br><br>Creating and interpreting charts and graphs to understand data.   | Understanding that data is used to forecast weather.<br><br>Recording data in a spreadsheet independently.<br>Sorting data in a spreadsheet to compare using the 'sort by...' option.<br><br>Designing a device which gathers and records sensor data.  | Understanding how data is collected in remote or dangerous places.<br><br>Understanding how data might be used to tell us about a location.  | Understanding how barcodes, QR codes and RFID work.<br><br>Gathering and analysing data in real time.<br><br>Creating formulas and sorting data within spreadsheets.  |
| Wider use of technology  |  |  |  |   |  |   |
|  | Recognising common uses of information technology, including beyond school.<br><br>Understanding some of the ways we can use the internet.   | Learning how computers are used in the wider world   | Understanding the purpose of emails.<br><br>Recognising how social media platforms are used to interact.   | Understanding that software can be used collaboratively online to work as a team.   | Learn about different forms of communication that have developed with the use of technology.   | Learning about the Internet of Things and how it has led to 'big data'.<br><br>Learning how 'big data' can be used to solve a problem or improve efficiency.  |
| Digital Literacy   |  |  |  |   |  |   |
| Recognising that a range of technology is used for different purposes.<br><br>Learning to log in and log out.  | Logging in and out and saving work on their own account.<br><br>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.<br><br>Understanding how to interact safely with others online.<br><br>Recognising how actions on the internet can affect others.<br><br>Recognising what a digital footprint is and how to be careful about what we post | Learning how to create a strong password.<br><br>Understanding how to stay safe when talking to people online and what to do if they see or hear something online that makes them feel upset or uncomfortable<br><br>Identifying whether information is safe or unsafe to be shared online.<br><br>Learning to be respectful of others when sharing online and ask for their permission before sharing content.<br><br>Learning strategies for checking if something they read online is true. | Recognising that different information is shared online including facts, beliefs and opinions.<br><br>Learning how to identify reliable information when searching online.<br><br>Learning how to stay safe on social media.<br><br>Considering the impact technology can have on mood.<br><br>Learning about cyberbullying.<br><br>Learning that not all emails are genuine, recognising when an email might be fake and what to do about it. | Recognising that information on the internet might not be true or correct and that some sources are more trustworthy than others.<br><br>Learning to make judgements about the accuracy of online searches.<br><br>Identifying forms of advertising online.<br><br>Recognising what appropriate behaviour is when collaborating with others online.<br><br>Reflecting on the positives and negatives of time spent online. Identifying respectful and disrespectful online behaviour. | Identifying possible dangers online and learning how to stay safe.<br><br>Evaluating the pros and cons of online communication.<br><br>Recognising that information on the internet might not be true or correct and learning ways of checking validity.<br><br>Learning what to do if they experience bullying online. Learning to use an online community safely | Learning about the positive and negative impacts of sharing online.<br><br>Learning strategies to create a positive online reputation.<br><br>Understanding the importance of secure passwords and how to create them.<br><br>Learning strategies to capture evidence of online bullying in order to seek help.<br><br>Using search engines safely and effectively.<br><br>Recognising that updated software can help to prevent data corruption and hacking. |



# The Stonebridge School

## Computing Progression Map

### Computing systems and networks

|  |  |   |  |  |  |   |
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| <p>To be able to understand what a computer keyboard is and recognising some letters and numbers.</p> <p>To know that a mouse can be used to click, drag and create simple drawings.</p> <p>To know that to use a computer you need to log in to it and then log out at the end of your session.</p> <p>To know that different types of technology can be found at home and in school.</p> <p>To know that you can take simple photographs with a camera or iPad. To know that you must hold the camera still and ensure the subject is in the shot to take a photo.</p> | <p>To know that "log in and log out" means to begin and end a connection with a computer.</p> <p>To know that a computer and mouse can be used to click, drag, fill and select and also add backgrounds, text, layers, shapes and clip art.</p> <p>To know that passwords are important for security.</p> <p>To know that when we create something on a computer it can be more easily saved and shared than a paper version.</p> <p>To know some of the simple graphic design features of a piece of online software.</p> | <p>To know the difference between a desktop and laptop computer.</p> <p>To know that people control technology.</p> <p>To know that buttons are a form of input that give a computer an instruction about what to do (output).</p> <p>To know that computers often work together.</p> <p>To know that touch typing is the fastest way to type.</p> <p>To know that I can make text a different style, size and colour.</p> <p>To know that "copy and paste" is a quick way of duplicating text.</p> | <p>To know what a tablet is and how it is different from a laptop/desktop computer.</p> <p>To understand what a network is and how a school network might be organised.</p> <p>To know that a server is central to a network and responds to requests made.</p> <p>To know how the internet uses networks to share files.</p> <p>To know that a router connects us to the internet.</p> <p>To know what a packet is and why it is important for website data transfer.</p> <p>To know the roles that inputs and outputs play on computers.</p> <p>To understand that email stands for 'electronic mail.'</p> <p>To know that an attachment is an extra file added to an email.</p> <p>To understand that emails should contain appropriate and respectful content.</p> <p>To know what some of the different components inside a computer are e.g. CPU, RAM, hard drive, and how they work together.</p> | <p>To understand that software can be used collaboratively online to work as a team.</p> <p>To know what type of comments and suggestions on a collaborative document can be helpful.</p> <p>To know that you can use images, text, transitions and animation in presentation slides</p> | <p>To know how search engines work.</p> <p>To understand that anyone can create a website and therefore we should take steps to check the validity of websites.</p> <p>To know that web crawlers are computer programs that crawl through the internet.</p> <p>To understand what copyright is.</p> <p>To know the difference between ROM and RAM.</p> | <p>To understand the importance of having a secure password and what "brute force hacking" is.</p> <p>To know that the first computers were created at Bletchley Park to crack the Enigma code to help the war effort in World War 2.</p> <p>To know about some of the historical figures that contributed to technological advances in computing.</p> <p>To understand what techniques are required to create a presentation using appropriate software.</p> |
|--|--|---|--|--|--|---|



# **The Stonebridge School** **Computing Progression Map**

| Programming  |  |  |   |  |  |  |
|--|--|--|---|--|--|--|
| <p>To know that being able to follow and give simple instructions is important in computing.</p> <p>To understand that it is important for instructions to be in the right order.</p> <p>To understand why a set of instructions may have gone wrong.</p> <p>To know that you can program a Bee-Bot with some simple commands.</p> <p>To understand that debugging means how to fix some simple programming errors.</p> <p>To understand that an algorithm is a set of clear and precise instructions.</p> | <p>To understand that an algorithm is when instructions are put in an exact order.</p> <p>To know that input devices get information into a computer and that output devices get information out of a computer.</p> <p>To understand that decomposition means breaking a problem into manageable chunks and that it is important in computing.</p> <p>To know that we call errors in an algorithm 'bugs' and fixing these 'debugging'.</p> <p>To understand the basic functions of a Bee-Bot.</p> <p>To know that you can use a camera/tablet to make simple videos.</p> <p>To know that algorithms move a bee-bot accurately to a chosen destination.</p> | <p>To understand what machine learning is and how that enables computers to make predictions.</p> <p>To know that loops in programming are where you set a certain instruction (or instructions) to be repeated multiple times.</p> <p>To know that abstraction is the removing of unnecessary detail to help solve a problem.</p> <p>To know that coding is writing in a special language so that the computer understands what to do.</p> <p>To understand that the character in ScratchJr is controlled by the programming blocks.</p> <p>To know that you can write a program to create a musical instrument or tell a joke.</p> | <p>To know that Scratch is a programming language and some of its basic functions.</p> <p>To understand how to use loops to improve programming.</p> <p>To understand how decomposition is used in programming. To understand that you can remix and adapt existing code.</p> | <p>To understand that a variable is a value that can change (depending on conditions) and know that you can create them in Scratch.</p> <p>To know what a conditional statement is in programming. To understand that variables can help you to create a quiz on Scratch.</p> <p>To know that combining computational thinking skills (sequence, abstraction, decomposition etc) can help you to solve a problem.</p> <p>To understand that pattern recognition means identifying patterns to help them work out how the code works.</p> <p>To understand that algorithms can be used for a number of purposes e.g. animation, games design etc.</p> | <p>To know that a soundtrack is music for a film/video and that one way of composing these is on programming software.</p> <p>To understand that using loops can make the process of writing music simpler and more effective.</p> <p>To know how to adapt their code while performing their music.</p> <p>To know that a Micro:bit is a programmable device.</p> <p>To know that Micro:bit uses a block coding language similar to Scratch.</p> <p>To understand and recognise coding structures including variables.</p> <p>To know what techniques to use to create a program for a specific purpose (including decomposition).</p> | <p>To know that there are text-based programming languages such as Logo and Python.</p> <p>To know that nested loops are loops inside of loops.</p> <p>To understand the use of random numbers and remix Python code.</p>  |
| Creating media   |  |  |   |  |  |  |
|  | <p>To understand that holding the camera still and considering angles and light are important to take good pictures.</p> <p>To know that you can edit, crop and filter photographs.</p> <p>To know how to search safely for images online.</p>   | <p>To understand that an animation is made up of a sequence of photographs.</p> <p>To know that small changes in my frames will create a smoother looking animation.</p> <p>To understand what software creates simple animations and some of its features e.g. onion skinning.</p>  | <p>To know that different types of camera shots can make my photos or videos look more effective.</p> <p>To know that I can edit photos and videos using film editing software.</p> <p>To understand that I can add transitions and text to my video.</p>                     | <p>To know some of the features of web design software.</p> <p>To know that a website is a collection of pages that are all connected.</p> <p>To know that websites usually have a homepage and subpages as well as clickable links to new pages, called hyperlinks.</p> <p>To know that websites should be informative and interactive.</p>   | <p>To understand that stop motion animation is an animation filmed one frame at a time using models, and with tiny changes between each photograph.</p> <p>To know that decomposition of an idea is important when creating stop-motion animations.</p> <p>To know that editing is an important feature of making and improving a stop motion animation.</p>   | <p>To know that radio plays are plays where the audience can only hear the action so sound effects are important.</p> <p>To know that sound clips can be recorded using sound recording software.</p> <p>To know that sound clips can be edited and trimmed.</p> |



## The Stonebridge School

### Computing Progression Map

#### **Data handling**

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| <p>To know that sorting objects into various categories can help you locate information.</p> <p>To know that using yes/no questions to find an answer is a branching database.</p> <p>To know that a pictogram is a way of showing information.</p> | <p>To know how that charts and pictograms can be created using a computer.</p> <p>To understand that a branching database is a way of classifying a group of objects.</p> <p>To know that computers understand different types of 'input'.</p> | <p>To understand that you can enter simple data into a spreadsheet.</p> <p>To understand what steps you need to take to create an algorithm.</p> <p>To know what data to use to answer certain questions.</p> <p>To know that computers can be used to monitor supplies.</p> | <p>To know that a database is a collection of data stored in a logical, structured and orderly manner.</p> <p>To know that computer databases can be useful for sorting and filtering data.</p> <p>To know that different visual representations of data can be made on a computer.</p> | <p>To know that computers can use different forms of input to sense the world around them so that they can record and respond to data.</p> <p>This is called 'sensor data'.<br/>To know that a weather machine is an automated machine that responds to sensor data.</p> <p>To understand that weather forecasters use specific language, expression and pre-prepared scripts to help create weather forecast films.</p> | <p>To know that Mars Rover is a motor vehicle that collects data from space by taking photos and examining samples of rock.</p> <p>To know what numbers using binary code look like and be able to identify how messages can be sent in this format.</p> <p>To understand that RAM is Random Access Memory and acts as the computer's working memory.</p> <p>To know what simple operations can be used to calculate bit patterns</p> | <p>To know that data contained within barcodes and QR codes can be used by computers.</p> <p>To know that infrared waves are a way of transmitting data.</p> <p>To know that Radio Frequency Identification (RFID) is a more private way of transmitting data.</p> <p>To know that data is often encrypted so that even if it is stolen it is not useful to the thief.</p> <p>To know that data can become corrupted within a network but this is less likely to happen if it is sent in 'packets'.</p> <p>I know that devices or that are not updated are most vulnerable to hackers.</p> <p>To know the difference between mobile data and WiFi.</p> |
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## The Stonebridge School

### Computing Progression Map

#### Online safety

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|  | <p>To know that the internet is many devices connected to one another.</p> <p>To know that you should tell a trusted adult if you feel unsafe or worried online.</p> <p>To know that people you do not know on the internet (online) are strangers and are not always who they say they are.</p> <p>To know that to stay safe online it is important to keep personal information safe.</p> <p>To know that 'sharing online' means giving something specific to someone else via the internet and 'posting' online means placing information on the internet.</p> | <p>To understand the difference between online and offline.</p> <p>To understand what information I should not post online.</p> <p>To know what the techniques are for creating a strong password.</p> <p>To know that you should ask permission from others before sharing about them online and that they have the right to say 'no.'</p> <p>To understand that not everything I see or read online is true.</p> | <p>To know that not everything on the internet is true: people share facts, beliefs and opinions online.</p> <p>To understand that the internet can affect your moods and feelings.</p> <p>To know that privacy settings limit who can access your important personal information. Information, such as your name, age, gender etc.</p> <p>To know what social media is and that age restrictions apply.</p> | <p>To understand some of the methods used to encourage people to buy things online.</p> <p>To understand that technology can be designed to act like or impersonate living things.</p> <p>To understand that technology can be a distraction and identify when someone might need to limit the amount of time spent using technology.</p> <p>To understand what behaviours are appropriate in order to stay safe and be respectful online.</p> | <p>To know different ways we can communicate online.</p> <p>To understand how online information can be used to form judgements.</p> <p>To understand some ways to deal with online bullying.</p> <p>To know that apps require permission to access private information and that you can alter the permissions.</p> <p>To know where I can go for support if I am being bullied online or feel that my health is being affected by time online.</p> | <p>To know that a 'digital footprint' means the information that exists on the internet as a result of a person's online activity.</p> <p>To know what steps are required to capture bullying content as evidence.</p> <p>To understand that it is important to manage personal passwords effectively.</p> <p>To understand what it means to have a positive online reputation.</p> <p>To know some common online scams.</p> |
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