



Declarative and Procedural Knowledge

Year 1

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Introduction

The Declarative and Procedural Knowledge documents are designed to support teachers in understanding the intended learning outcomes of each unit. They outline the specific knowledge and skills that children should acquire and demonstrate by the end of their learning.

- Declarative Knowledge sets out what children will **know**. This includes facts, concepts, definitions, and key ideas that form the foundation of the unit.
- Procedural Knowledge sets out what children will **be able to do**. This focuses on the skills and processes children should develop and apply when using technology.

These documents are used to:

- Provide teachers with a clear overview of learning expectations for each unit.
- Ensure consistency of teaching and progression of knowledge and skills across year groups.
- Support planning, teaching, and assessment by highlighting the essential outcomes to focus on.
- Reinforce the balance between understanding (knowing) and application (doing) in computing.

This document aims to help teachers see the bigger picture of what children will learn, how they will apply it, and how these elements connect across the computing curriculum.

Introduction to Purple Mash

National Curriculum Links	Dominant objectives for this unit: • Use technology purposefully to create, organise, store, manipulate and retrieve digital content. • Use technology safely and respectfully, keeping personal information private.
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Declarative - By the end of the unit, the children will know that:	Procedural – By the end of the unit, the children will know how to:
• It is important to log in to a site, the importance of keeping passwords safe and the need to log out at the end of a session.	• Access Purple Mash from home and school. • Log out of Purple Mash. • Give reasons why it is important to keep a password safe and not share it with other people.
• An avatar is a virtual representation of a person suitable for use online.	• Make and edit their own avatar.
• The 2Do system allows teachers to assign tasks to children within Purple Mash.	• Open 2Dos. • Save 2Dos. • Hand in 2Dos and communicate with their teacher via the 2Do.
• Online sites have a main page called the homepage.	• Access the Purple Mash homepage when on the site.
• Online sites often use an alert system to communicate with the user.	• Access alerts within Purple Mash.
• To move to a different activity in Purple Mash, you must first close the current activity.	• Close activities in Purple Mash.
• Many online sites, including Purple Mash, have an area for an individual's work that is accessible only to the individual (and in Purple Mash to their teacher as well).	• Access their work area. • Save work in their work area. • Locate and open work they have done previously in their work folder.
• To access Purple Mash programs, you use the Tools area.	• Open a specified tool.
• You can access non-visible parts of a screen using scrolling.	• Scroll up and down and from side to side where applicable.
• You can use a physical or on-screen keyboard to type upper and lower-case letters and spaces.	• Type upper and lower-case letters and spaces using the device available.

Creative Computing

National Curriculum Links	Dominant objectives for this unit: Use technology purposefully to create, organise, store, manipulate and retrieve digital content.
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Declarative - By the end of the unit, the children will know that :	Procedural – By the end of the unit, the children will know how to :
Art can be created using digital tools.	- Select colours and painting effects in 2Paint. - Control a computer mouse. - Use a mouse or finger (device dependent) to perform tasks.
Digital tools can be used to play and make simple games.	- Use drag and drop methods to complete games, including 2DIY jigsaws and placing activities. - Use the image gallery to create jigsaw images. - Use hotspots in 2DIY placing games.
Purple Mash allows a user to share work for others to use on digital display boards.	- Share work to a Purple Mash Display Board. - Access shared work on a Purple Mash Display Board.

Data Explorers

National Curriculum Links	Dominant objectives for this unit: Use technology purposefully to create, organise, store, manipulate and retrieve digital content.
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Declarative - By the end of the unit, the children will know that :	Procedural – By the end of the unit, the children will know how to :
Items can be grouped using a range of criteria, and a logical process should be used when doing so.	- Identify criteria that can be used to sort items into groups. - Sort items using criteria. - Logically sort items into groups.
Digital tools can be used to group images of items.	Complete grouping questions in 2Quiz using given criteria.
Sorting is a way to organise items.	Complete sequencing questions in 2Quiz using given sorting criteria.
Sorting and grouping have different meanings.	Decide whether it is better to sort or group items to organise them.
Data is information that can be collected and used.	- Identify items to be grouped or sorted as examples of data that can be organised. - Use data grouping and sorting to answer questions.
Data can be represented digitally using pictures.	- Create a pictogram using data from the class in 2Count. - Answer questions about the class using a pictogram.
Before collecting data, you must think about how it can be used and what information to collect.	- Collect and record data. - Input the data into the 2Count tool. - Make a pictogram using 2Count. - Answer questions using the pictogram.

Creating and Following Instructions

National Curriculum Links	Dominant objectives for this unit: Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.
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Declarative - By the end of the unit, the children will know that:	Procedural – By the end of the unit, the children will know how to:
To achieve a specific effect when building something, accurate instructions must be followed.	- Think carefully about how to word oral instructions to achieve a desired outcome. - Give clear, precise and concise instructions for someone to follow. - Test whether instructions have been followed by comparing the outcome to the instructions. - Examine instructions to see where confusion might have arisen.
- Computer programs need precise instructions to follow and these are called algorithms. - If instructions are vague, outcomes will vary for a given task.	- Use a computing device to follow simple instructions in a painting project. - Examine the outcomes of following instructions to check for differences in interpretation. - Decide whether any differences were due to the clarity of the instructions or the end user.
The order of instructions for a task affects the results.	- Identify when a sequence of instructions is incorrect and why. - Explore the possible outcomes of following incorrectly sequenced instructions.
Correcting errors in an algorithm or program is called debugging.	- Find errors in a simple algorithm. - Correct an algorithm sequence by re-ordering it. - Recognise when an algorithm has been debugged. - Apply learning about debugging an algorithm to other incorrectly sequenced instructions, such as baking cakes.

Animated Stories

National Curriculum Links	Dominant objectives for this unit: Use technology purposefully to create, organise, store, manipulate and retrieve digital content.
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Declarative - By the end of the unit, the children will know that :	Procedural – By the end of the unit, the children will know how to :
There are differences between traditional books and digital books.	Identify differences and similarities between traditional books and digital books.
Images can be created within digital book software.	- Use the painting tools within 2Create a Story. - Use picture editing tools such as 'undo' and the 'eraser' to improve created images.
Digital books can have animations.	- Apply animation effects to images in 2Create a Story. - Choose effects that make characters appear to interact.
Copying and pasting is a term used in computing when things are copied from one place to another.	- Copy and paste in 2Create a Story. - Organise and copy pages in a digital book.
Audio such as sound effects, voice recordings and music can be included within digital books.	- Record sound for 2Create a Story pages. - Insert sound effects and music into a 2Create a Story book.
Backgrounds are static images in contrast to the animated foreground.	Add backgrounds to 2Create a Story pages.
The style of digital text is called the font. This can be changed after typing the text.	Change the font and size of typed text.

Coding

National Curriculum Links	Dominant objectives for this unit: • 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.
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Declarative - By the end of the unit, the children will know that:	Procedural – By the end of the unit, the children will know how to:
• Computer programs work by following instructions called algorithms. These are written as computer code that the computer can interpret.	• Create instructions in the form of simple algorithms with attention to the order and the level of detail. • Interpret what a piece of code means.
• In 2Code, code is created using coloured code blocks.	• Recognise object code blocks in 2Code are light blue. • Recognise action code blocks in 2Code are dark blue. • Recognise event code blocks in 2Code are green. • Recognise output code blocks in 2Code are purple.
• Code view is the place in 2Code where you see and use the blocks of code.	• Switch to code view. • Code blocks are dragged into the coding area to create commands.
• Each single instruction such as ‘Object Right’ is called a command.	• Understand how code blocks fit together to create a command. • Make a simple command in 2Code by using an object and action together.
• To make an algorithm happen, you must execute, or run, the code.	• Execute the code to see the effect by clicking Run.
• An event is something that makes a block of code run in response to an action such as a user pressing a key or clicking a screen.	• Use the ‘When Clicked’ event code block. • Position a command inside a ‘When Clicked’ event code block. • Give an object an action that occurs when it is clicked. • Test ‘When Clicked’ events.
• Debugging is the name for fixing code that isn’t working how it was designed to work.	• Begin to use logical reasoning to find where bugs in the code are. • Fix bugs in code. • Test whether bugs have been fixed.

• The look of a program in 2Code is created in the Design View using backgrounds and objects.	• Switch to design view. • Choose background images. • Add objects and modify some attributes such as scale.
• Program design is the first stage to making a well thought out program.	• Plan what objects in a scene will do. • Recognise that this is the algorithm for the program. • Use own design to code a program. • Debug the program against the design specifications.

Technology Around Us

National Curriculum Links	Dominant objectives for this unit: • Recognise common uses of information technology beyond school. • Use technology safely and respectfully.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• Technology is something that uses scientific knowledge to solve problems or invent useful tools.	• Recognise examples of technology. • Describe the purpose of common types of technology.
• Technology is used within many environments.	• Identify technology within school, at home and in the wider world. • Explain how this technology is helpful.
• Not all technology is digital technology. Digital Technology is a subset of technology for sharing information.	• Give examples of digital technology and contrast this with technology.
• The word hardware is used to describe the physical parts of a digital technology device.	• Name examples of technology hardware including peripheral devices.
• It is important to use technology safely and that there are some risks associated with the use of technology.	• Use devices safely. • Point out the risks of situations involving technology.

Making Beats

National Curriculum Links	Dominant objectives for this unit: Use technology purposefully to create, organise, store, manipulate and retrieve digital content.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
There are differences between music played using musical instruments and digitally created music.	Identify differences and similarities between music played using instruments and digitally composed music.
Digital tools such as 2Explore and 2Beat can be used to compose music.	- Compose a melody using 2Explore. - Select sounds from the available libraries. - Compose a beat using 2Beat.
Digital music tools can be used to change aspects of the composition.	Use digital music tools to change the tempo, volume, looping and length of music compositions.
Digital music tools can be used to create the sound of multiple instruments at once.	Use 2Beat to compose an interaction of different instrument sounds.
Different digital tools are better for different purposes.	Select the best music tool for their compositions.



Declarative and Procedural Knowledge

Year 2

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Introduction

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Introduction to Purple Mash

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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• It is important to log in to a site, the importance of keeping passwords safe and the need to log out at the end of a session.	• Access Purple Mash from home and school. • Log out of Purple Mash. • Give reasons why it is important to keep a password safe and not share it with other people.
• An avatar is a virtual representation of a person suitable for use online.	• Make and edit their own avatar.
• The 2Do system is used to set work for children within Purple Mash.	• Open 2Dos. • Save 2Dos. • Hand in 2Dos and communicate with their teacher via the 2Do.
• Online sites have a main page called the homepage.	• Access the Purple Mash homepage when on the site.
• Online sites often use an alert system to communicate with the user.	• Access alerts within Purple Mash.
• To move to a different activity in Purple Mash, you must first close the current one.	• Close activities in Purple Mash.
• Many online sites, including Purple Mash, have an area for an individual's work that is accessible only to the individual (and in Purple Mash to their teacher as well).	• Access their work area. • Save work in their work area. • Locate and open work they have done previously in their work folder.
• To access Purple Mash programs, you use the Tools area.	• Open a specified tool.
• You can access non-visible parts of a screen using scrolling.	• Scroll up and down and from side to side where applicable.
• You can use a physical or on-screen keyboard to type upper and lower-case letters and spaces.	• Type upper and lower-case letters and spaces using the device provided.

Route Explorers

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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• The combination of a direction and a distance is known as a command in 2Go.	• Input commands in 2Go.
• Commands can be input into 2Go to control the movement of a screen turtle in four directions.	• Input purposeful commands in 2Go to move the turtle in a specific direction towards a goal.
• Planning a route is important in order to input the correct commands.	• Use techniques such as finger movements to plan a route.
• Routes can be programmed to perform more than one command in a sequence.	• Input several commands into a sequential algorithm layout and run this code to move the turtle along a programmed route. • Reset the turtle to the starting position to re-run the code.
• A list of instructions for a route is the algorithm.	• Plan the route by writing the algorithm first and then inputting the commands.
• Errors (bugs) occur because commands may have been input incorrectly. • Fixing the errors is called debugging.	• Make logical attempts to debug code for routes. • Reset, debug and re-run the code to test routes.

The Internet

National Curriculum Links	Dominant objectives for this unit: • Use technology purposefully to create, organise, store, manipulate and retrieve digital content. • Recognise common uses of information technology beyond school.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• The Internet is a global network of connected computers around the world.	• Explain the difference between the Internet and the World Wide Web, recognising that they describe different things.
• An internet connection allows people to communicate with others over the internet and that this is commonly known as being online. • An internet connection can be made using wires or wirelessly.	• Explain that Wi-Fi describes a wireless internet connection.
• A browser is used to access websites and webpages of the World Wide Web.	• Recognise a web browser.
• The World Wide Web refers to the documents and pages someone sees when using a browser.	• Find information on a school's website by viewing different webpages.
• Smart devices are those that can connect to the internet to do more than a basic function.	• Decide whether a device is a smart device. • Give examples of smart devices.
• The 'front page' of a website is known as the home page.	• Navigate to the Purple Mash homepage and to a school's website homepage.
• Webpages have links that, when clicked, display other webpages.	• Use a link on a webpage of a school's website.
• Websites can be found using a browser that contains a search engine.	• Use keywords to search for information using a search engine.

Creating Pictures

National Curriculum Links	Dominant objectives for this unit: Use technology purposefully to create, organise, store, manipulate and retrieve digital content.
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Declarative - By the end of the unit the children will know that :	Procedural – By the end of the unit the children will know how to :
- Digital art tools usually have a choice of painting effects. - Painting effects can be combined to help a user make pictures of varying styles.	- Explore the range of painting effects in 2Paint. - Observe how the painting effects give different results. - Produce digital images in traditional art styles using digital painting effects.
The size of an onscreen painting tool brush stroke can be manipulated.	Use the brush tool slider to change the size of brush strokes to achieve the desired effects.
Intensity of colours can be manipulated digitally.	Use the dilute tool to manipulate the intensity of any selected colour.
Outline features in a digital art program can help a user compose an image.	Make use of outline features, such as selecting, resizing, and editing outlines, to enhance their digital art.

Spreadsheets

National Curriculum Links	Dominant objectives for this unit: • 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.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• A spreadsheet is a program that organises data in rows and columns. • 2Calculate is a type of spreadsheet program. • Each box in a spreadsheet is called a cell, and every cell has a unique name. • Rows run horizontally, and columns run vertically.	• Identify a cell by its name. • Enter data into a cell and move between cells with ease. • Explain the difference between a row and column.
• Formatting tools can be used to change the way data looks (e.g. size, colour, wrap text). • It is important to consider the clarity of a spreadsheet and what can be done to improve this.	• Resize rows and columns to make data clearer. • Use formatting tools such as colour, wrap text, and alignment to improve clarity and organisation of data. • Check and improve their spreadsheet to ensure it is neat, accurate, and easy to understand.
• Images and numbers can be used in spreadsheets, and values can be assigned to images.	• Insert images and assign them numerical values.
• Spreadsheets can use a range of mathematical operations to carry out calculations automatically.	• Apply calculation tools (add, subtract, multiply, divide) to carry out operations in a spreadsheet.
• 2Calculate contains various tools that can be used for different reasons. • The 'Is Equals' tool can check if a calculation is correct. • The 'Quiz' tool can be used to make interactive questions inside a spreadsheet. • The 'Count' tool can show how many of something there are in a spreadsheet.	• Use the 'Is Equals' tool to check whether a calculation is correct. • Use the 'Quiz' tool to create an interactive calculation. • Use the 'Count' tool to total how many of an item appear in the spreadsheet.
• Block diagrams are a way of presenting data to make it easier to understand.	• Create block diagrams in 2Calculate to present data visually.

- | | |
|---|--|
| <ul style="list-style-type: none">• Two sets of data are needed to create a block diagram (one for the category, one for the amount). | |
|---|--|

Questioning

National Curriculum Links	Dominant objectives for this unit: Use technology purposefully to create, organise, store, manipulate and retrieve digital content.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
Data is information that can be collected, recorded, and presented in different ways.	Collect simple data by asking questions and recording answers.
- A tally chart is a method of counting and recording data. - Pictograms and bar charts are ways of presenting data visually.	Use tally charts to organise collected data.
Closed questions can limit responses, while open questions allow more detailed answers.	Create pictograms and bar charts using 2Count to represent information.
Yes/No questions can be used to help sort and classify information.	Form clear Yes/No questions to help identify or sort objects.
A branching database uses Yes/No questions to organise and identify information.	- Follow a branching database to find an answer. - Use 2Question to navigate and explore branching databases.

Coding

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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• In computing, a set of instructions is known as an algorithm. Steps in an algorithm must be followed to achieve the intended outcome.	• Follow a written algorithm. • Identify required events, objects and actions from a program algorithm.
• The collision detection event is a way to cause an action when two objects collide with each other.	• Identify the collision detection block within the event category blocks. • Use a collision detection block in a program. • Assign two objects within the collision detection command. • Assign an event for when the two objects collide.
• Programs follow a sequence of instructions (commands) in order.	• Run code and see the sequential effect that occurs.
• Timer commands can be used to make parts of the program run after a set time.	• Identify the timer command within the control category blocks. • Use the time after command and set a specified number of seconds. • Nest actions within the timer command to delay their running.
• Different object types in 2Code have different attributes that can be changed.	• Use a variety of object types. • Identify attributes which appear under some objects and not in others e.g. a turtle type and a character type. • Alter attributes of an object, such as the image and scale within Design View.
• Event commands in 2Code are used to create blocks of code that are run when an event happens. There are different event command blocks in 2Code.	• Recognise the event command blocks – When Key Event, When Swiped Event, When Clicked Event and Collision Detection. • Use a variety of event blocks in different circumstances.

	• Use specific event commands for specific objects, such as a click event for a button object.
• Debugging is the process of testing that a program works as intended, looking for any bugs and fixing the problems when found.	• Use logical reasoning to identify the source of bugs and attempt to fix them. • Test and debug code in a systematic way.

Making Music

National Curriculum Links	Dominant objectives for this unit: Use technology purposefully to create, organise, store, manipulate and retrieve digital content.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
Live, instrumental music is created by real instruments and digital music is created by using a computer.	- Identify if sounds are made by real instruments or made by a computer. - Identify the sound of different instruments, whether live or digitally made.
Music can be made digitally using programs like 2Sequence.	- Open 2Sequence. - Listen to a premade composition by pressing the play button. - Observe what happens on the screen when composition is playing including the placement of sounds.
Sounds can be incorporated into music programs to make a tune.	- Explore the sounds and instruments category. - Drag sounds into the playable area. - Play and experiment with the organisation of sounds on each track.
Notes that are the same colour on 2Sequence represent the same note tone.	- Compare the sounds of different notes. - Recognise that some notes sound the same. - Recognise that some notes sound better together than others.
The speed of a digital musical, known as tempo, can be altered by changing the BPM (beats per minute).	- Locate the beats per minute slider. - Experiment with changing the slider's position. - Listen in play mode to how changing the position of the slider affects a composition.
The volume of instruments/sounds on a track can be changed when using music programs.	- Locate the different rows of music. - Locate the volume sliders at the end of each row of music (tracks). - Adjust the volume on individual rows of music (tracks). - Play the music and test the effect of altering the volume of individual tracks.
Looping a track means that it continues to play on repeat.	- Experiment with the looping feature. - Identify how this affects a tune.

	• Manipulate a piece of music so that it sounds correct when looping and doesn't have a noticeable jump when it restarts each repeat.
• Music programs let users incorporate their own sounds into a composition.	• Locate the My Sounds section. • Click on the record icon. • Use the record button to incorporate own sound from a microphone. • Test the recording back by pressing play. • Click done when happy with recording.



Declarative and Procedural Knowledge

Year 3

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Introduction to Purple Mash

National Curriculum Links	Dominant objectives for this unit: Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the children will know that:	Procedural - By the end of the unit the children will know how to:
It is important to log in to a site, the importance of keeping passwords safe and the need to log out at the end of a session.	- Access Purple Mash from home and school. - Log out of Purple Mash. - Give reasons why it is important to keep a password safe and not share it with other people.
An avatar is a virtual representation of a person suitable for use online.	Make and edit their own avatar.
The 2Do system is used to set work for children within Purple Mash.	- Open 2Dos. - Save 2Dos. - Hand in 2Dos and communicate with their teacher via the 2Do.
Online sites have a main page called the homepage.	Access the Purple Mash homepage when on the site.
Online sites often use an alert system to communicate with the user.	Access alerts within Purple Mash.
To move to a different activity in Purple Mash, you must close the current activity.	Close activities in Purple Mash.
Many online sites, including Purple Mash, have an area for an individual's work that is accessible only to the individual (and in Purple Mash to their teacher as well).	- Access their work area. - Save work in their work area. - Locate and open work they have done previously in their work folder.
To access Purple Mash programs, you use the Tools area.	Open a specified tool.
You can access non-visible parts of a screen using scrolling.	Scroll up and down and from side to side where applicable.

Email

National Curriculum Links	Dominant objectives for this unit: • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. • Understand computer networks, including the Internet; how they can provide multiple services, such as the World Wide Web; and the opportunities they offer for communication and collaboration.
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Declarative - By the end of the unit the children will know that:	Procedural - By the end of the unit the children will know how to:
• There are different methods of communication and they each have strengths and weaknesses.	• Explain the advantages and disadvantages of different communication methods. • Choose an appropriate communication method for a task.
• Emails are a form of digital communication.	• Make use of 2Email to communicate within school. • Recognise the differences between digital and non-digital communication methods. • Explain different digital communication methods such as instant messaging, email and video calls.
• Emails can be sent and received almost instantly to anyone with an email address.	• Identify the advantages of instant communication. • Explain the differences between email and traditional communication methods which are not instant.
• Common features of email software are the inbox, the 'To' address field, the sender email address, the subject, the message text, and the compose and reply functions.	• Identify the common features of the email screen. • Make use of these common features of email software to communicate digitally.
• Alerts can be used to notify a person that they have unread email.	• Check alerts for new messages and respond to these.
• Address books can be saved in the email software. This provides a convenient way to send emails without typing the full email address each time.	• Use the address book within 2Email to find contacts. • Send emails to multiple contacts using the address book.
• Pictures, documents and other file types can be attached to emails.	• Identify the attachment icon. • Select files to attach to an email and send. • Be cautious of emails that have attachments.

	• Discuss the advantages and disadvantages of being able to send attachments with emails.
• There are risks related to use of email.	• Recognise a concerning email/contact. • Identify who a trusted contact is. • Report any concern to a trusted adult and use the report to teacher feature in 2Email. • Consider consent when sharing content digitally. • Recognise personal and private information and know what is not appropriate to share with a recipient.

Route Planners

National Curriculum Links	Dominant objectives for this unit: • 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.
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Declarative - By the end of the unit the children will know that:	Procedural - By the end of the unit the children will know how to:
• The combination of a direction and a distance is known as a command in 2Go.	• Input commands in 2Go.
• Commands can be input into 2Go to control the movement of a screen turtle in four directions.	• Input purposeful commands in 2Go to make the turtle move in a particular direction towards a goal.
• The turtle can be set to rotate by angles of 90° or 45° both clockwise and anticlockwise.	• Input commands that rotate the turtle to face the desired direction for movement using both 90° and 45° angles.
• Planning a route is important to ensure the correct commands are input.	• Use techniques such as finger movements to plan a route.
• A list of instructions for a route is called an algorithm.	• Plan the route by first writing the algorithm and then inputting the code commands.
• Routes can be programmed to perform more than one command in a sequence.	• Input several commands into a sequential algorithm layout and run this code to move the turtle along the programmed route. • Reset the turtle to the starting position to re-run the code.
• Routes can be programmed to repeat a sequence of commands a set number of times.	• Use the repeat algorithm layout for 2Go commands. • Anticipate the effect of the repeat and use logical reasoning to decide upon when this layout is useful to accomplish a task.
• Errors (bugs) occur because commands may have been input incorrectly. • Fixing the errors is called debugging.	• Make logical attempts to debug code for routes.

	Reset, debug and re-run the code to test routes.
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Branching Databases

National Curriculum Links	Dominant objectives for this unit: Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the children will know that:	Procedural - By the end of the unit the children will know how to:
A database is a collection of data organised in a way that it can be searched, and information found easily.	- Explain what a database is. - Provide examples of common uses of a database such as the school's attendance database.
A binary question is one that can be answered with 'yes' or 'no'.	Explain the differences between a binary question and an open question.
Branching databases are structured using binary choices.	- Identify binary questions that could be used to sort items. - Sort items according to whether the answer the question is yes or no.
A good binary question splits a group roughly in half, half with the answer yes, half with the answer no.	Choose binary questions that split a group of objects into half.
When using a binary database, the questions eliminate data until just one record is left, the item can then be identified.	Use a binary database in 2Question to identify items.
Branching databases can be created using programs such as 2Question.	Add records to a 2Question database then sort the records using binary questioning to create the database.
It is important to test and debug when creating branching databases so that it works as intended.	- Work through all routes of a branching database to test whether it works as intended. - Identify and fix bugs in a database.

Spreadsheets

National Curriculum Links	Dominant objectives for this unit: • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the children will know that:	Procedural - By the end of the unit the children will know how to:
• A spreadsheet is a digital tool used to organise and analyse data. • A sheet is one page within a spreadsheet file and that several sheets can exist in one file.	• Create and open a spreadsheet to record and organise data effectively. • Add, rename, and organise multiple sheets within a single spreadsheet.
• Cells are the individual boxes where data is entered, arranged in rows and columns.	• Enter, edit, and delete data accurately within cells.
• Advanced Mode provides more tools and features than simple mode.	• Explore and use features available in Advanced Mode of 2Calculate to enhance spreadsheets.
• Copy and total tools allow data to be copied or totalled automatically across rows, columns, and diagonals.	• Use the copy and total tools to duplicate or total data efficiently in different directions.
• A formula is a set of instructions that tells a spreadsheet what to calculate, starting with an equals sign (=).	• Enter simple formulae manually or with the Formula Wizard to calculate values.
• The Formula Wizard helps users build formulae without typing them manually.	• Open and use the Formula Wizard in simple or advanced mode to select operations or functions.
• A function is a built-in formula (e.g. SUM, AVERAGE, MIN, MAX) that performs specific calculations automatically.	• Apply built-in functions such as SUM, AVERAGE, MIN, and MAX to sets of data.
• A range is a group of selected cells used together in a formula or function.	• Select a range of cells when applying formulae or functions.
• Formatting tools, such as merge cells, can improve how data looks.	• Merge cells to create headings or improve layout and presentation.
• Spreadsheets can be used to solve real-life problems such as comparing values or analysing costs.	• Use spreadsheet tools to solve real-world problems and explain how solutions were reached.

Problem solving with data involves choosing the most efficient tool or function for the task.	Select and apply appropriate formulae, functions, or tools to answer a given question or scenario.
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Coding

National Curriculum Links	Dominant objectives for this unit: - 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.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
Flowcharts are a type of diagram that use specifically shaped labelled boxes and arrows to represent an algorithm as a diagram.	- Identify features of a flowchart including the starts, inputs, outputs, delays such as a timer, actions and events. - Follow the flow of the chart and interpret what it is representing. - Use a flowchart as part of a planning process for designing a program.
- Timers can control when a block of commands run. - Timer commands can be run after a timed delay or at regular intervals. - In 2Code there are two timer options, timer every or timer after. These can be altered by changing the number of seconds/quarter seconds.	- Code the features of timer after command including the interval, action(s), correct nesting of commands. - Distinguish between the use of the timer every and timer after commands. - Use a timer every command to make an event happen repeatedly.
Repeat is a control block allowing blocks of commands to repeat a specified number of times.	- Identify situations when a repeat command can make the code more efficient. - Use a repeat command to make other commands repeat.
Testing and debugging are an important part of the process of making computer programs.	Read the code of example programs with nesting to determine the outcome of running the code.

• Understanding what nesting is and the effect it has on a program can help when trying to debug a program.	• Test what happens when changing how a program is nested. Examples could include moving a timer so that it is nested within a timer that is currently nested within a when clicked command and comparing how it executes. • Use the knowledge of nesting to help debug a program that isn't working as intended.
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Presentations (Microsoft, Google and Apple)

National Curriculum Links	Dominant objectives for this unit: Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the children will know that:	Procedural - By the end of the unit the children will know how to:
You can use Presentation software to create and display information to an audience that is clear and engaging.	Explain what presentation software is used for.
There is a range of different presentation software available such as Microsoft Powerpoint, Google Slides and Apple Keynote which share similar layout features.	- Locate and open appropriate presentation software. - Identify some of the basic layout features of the software.
Simple presentations can be made quickly by using features such as textboxes, word art and images.	- Locate and click on a blank presentation. - Delete existing text boxes on a blank slide. - Insert new text boxes manipulating size and position. - Insert word art into a presentation slide. - Insert images into a presentation slide. - Resize and manipulate images appropriately on a slide.
Designs of slides can be changed.	- Identify the design area from the menu ribbon. - Explore the different design templates available. - Preview designs and apply one of choice to a presentation.
Animations can be applied to images and text to make a presentation more eye-catching.	- Select an image on a slide. - Identify the animation area from the menu ribbon. - Apply an animation to an image.
Transitions can be to change the way a slide moves onto the next, in an eye-catching way.	- Select a slide that a transition is to be applied to. - Identify transitions from the menu ribbon. - Select and apply a suitable transition.
Slide notes can be added to provide the presenter with prompts of what to say when presenting each slide.	- Locate the slide notes box. - Type notes that are useful to prompt the presenter with what to say when presenting.

• An effective presentation contains a clear main message, with short simple sentences and relevant pictures on the slides. It uses a good layout with interesting effects, in an organised order.	• Consider the features of an effective presentation when creating one. • Use all taught skills to produce an effective and informative presentation.
• When presenting to an audience, it is important to speak clearly, make good eye contact, use notes to explain things clearly and take your time.	• Rehearse their slideshows before presenting in front of others. • Follow the instructions to present effectively.

Touch Typing

National Curriculum Links	Dominant objectives for this unit: • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the children will know that:	Procedural - By the end of the unit the children will know how to:
• Typing is the action or skill of writing something by means of a keyboard (physical or virtual).	• Use basic touch-typing skills to become quicker and more efficient with typing.
• It is important to have a good posture when typing to ensure their bodies remain comfortable and don't get sore.	• Check that posture is correct when typing. • Position equipment correctly so that eyes are level with monitor. • Place feet on the floor. • Position wrists so that they are not touching anything when typing.
• A keyboard is a device with a set of keys (buttons) that you press to type letters, numbers, punctuation and symbols into a computer. It can come in different shapes and sizes.	• Use a range of different keyboards to type letters, numbers, punctuation and symbols.
• To be efficient at typing, hands should be positioned correctly on a keyboard and the left and right hands should work independently of each other.	• Use the left hand to type letters. • Use the right hand to type letters. • Locate the ridges on keys F and J to find where the index fingers should rest on the keys. • Position the left and right hands correctly. • Build up to combining left and right-hand use to type words.
• Home, top and bottom row keys are areas on a keyboard where specific keys are located.	• Locate the home, top and bottom keys. • Open activities in 2Type referencing the keyboard guide to support recognition of using the correct key when typing letters.
• Numbers are located on the Number Row at the top of the keyboard.	• Type numbers using the correct hand and fingers.
• The shift key is used alongside another key to type capital letters and different punctuation marks and symbols.	• Use the shift key by pressing the key on either side of the keyboard with their little finger.

The space bar is pressed with the thumb and types a space between letters.	Press the space bar efficiently to form spaces between words.
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micro:bits

National Curriculum Links	Dominant objectives for this unit: - 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.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
A micro:bit is a tiny computer which needs instructions in code to make it work.	- Explain that a micro:bit is a piece of hardware that can have code created for it that makes use of its inputs and outputs. - Recognise and locate key hardware components on the micro:bit such as its display, speaker and accelerometer.
A micro:bit can produce outputs.	- Identify and use code blocks that produce outputs. - Use display text, show LEDs and play music outputs in program to meet specific intentions. - Code a micro:bit to make different outputs happen depending on different inputs.
A micro:bit can receive inputs.	- Identify and use code blocks that are associated with receiving inputs. - Use event commands such as 'when micro:bit button' and 'when gesture' in programs to meet specific intentions. - Make a program that requires inputs (event commands as above) that produce an output.
Code from the coding environment can be transferred onto a micro:bit.	- Use the simulator within the Freecode micro:bit environment to test code before transferring to micro:bit. - Use the transfer feature to move code to a micro:bit.
The order (sequence) of instructions is important when coding.	Recognise how the order of code is essential in order to meet a program's intentions.

	• Use sleep command within a sequence of code to temporarily pause a program e.g. when creating an animation effect using LEDs. • Use the repeat forever command within a sequence of code to produce an infinite looping sequencing such as a beating heart animation.
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Declarative and Procedural Knowledge

Year 4

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Introduction

The Declarative and Procedural Knowledge documents are designed to support teachers in understanding the intended learning outcomes of each unit. They outline the specific knowledge and skills that children should acquire and demonstrate by the end of their learning.

- Declarative Knowledge sets out what children will **know**. This includes facts, concepts, definitions, and key ideas that form the foundation of the unit.
- Procedural Knowledge sets out what children will **be able to do**. This focuses on the skills and processes children should develop and apply when using technology.

These documents are used to:

- Provide teachers with a clear overview of learning expectations for each unit.
- Ensure consistency of teaching and progression of knowledge and skills across year groups.
- Support planning, teaching, and assessment by highlighting the essential outcomes to focus on.
- Reinforce the balance between understanding (knowing) and application (doing) in computing.

This document aims to help teachers see the bigger picture of what children will learn, how they will apply it, and how these elements connect across the computing curriculum.

Introduction to Purple Mash

National Curriculum Links	Dominant objectives for this unit: • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• It is important to log in to a site, the importance of keeping passwords safe and the need to log out at the end of a session.	• Access Purple Mash from home and school. • Log out of Purple Mash. • Give reasons as to why it is important to keep a password safe and not share it with other people.
• An avatar is a virtual representation of a person suitable for use online.	• Make and edit their own avatar.
• The 2Do system is used to set work for children within Purple Mash.	• Open 2Dos. • Save 2Dos. • Hand in 2Dos and communicate with their teacher via the 2Do.
• Online sites have a main page called the homepage.	• Access the Purple Mash homepage when on the site.
• Online sites often use an alert system to communicate with the user.	• Access alerts within Purple Mash.
• To move to a different activity in Purple Mash, you must close the current activity.	• Close activities in Purple Mash.
• Many online sites, including Purple Mash, have an area for an individual's work that is accessible only to the individual (and in Purple Mash to their teacher as well).	• Access their work area. • Save work in their work area. • Locate and open work they have done previously in their work folder.
• To access Purple Mash programs, you use the Tools area.	• Open a specified tool.
• You can access non-visible parts of a screen using scrolling.	• Scroll up and down and from side to side where applicable.

Unpacking Hardware and Software

National Curriculum Links	Dominant objectives for this unit: Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
The word 'technology' describes using scientific knowledge to design and make tools, systems or machines that help solve problems or make tasks easier.	Identify whether an item is an example of technology.
Electrical, digital and smart technology are sub-sets of technology.	Decide whether an item is an example of electrical, digital or smart technology.
Hardware describes the physical parts of a computer.	- Define what is meant by hardware, components and peripherals. - Name hardware components of a computer system. - Describe the function of these different parts.
Software describes the programs that instruct a computer to complete computational tasks.	Identify the functions and common components of different software tools and relate them to the tasks those tools perform.
Software and hardware operate together to follow processes that assist in completing tasks.	Describe a process in terms of inputs, hardware and software processing and outputs.

Animation

National Curriculum Links	Dominant objectives for this unit: • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• Some animations are created by hand and others with the help of technology.	• Describe how hand drawn animation is created. • Make a simple flick animation book. • Contrast the process of animating by hand to the use of animation technology.
• Animation software has specific functions that support the animation of still images such as static backgrounds, onion skinning and copying frames.	• Use 2Animate to make simple animations using the specific animation functionality.
• Choices of sound effects, their timing and frames per second settings can enhance an animation	• Choose appropriate sound effects and speeds for animations.
• Storyboarding is a process that supports planning an animation.	• Use storyboarding to plan an animation.

Logo

National Curriculum Links	Dominant objectives for this unit: • 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.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• Logo is a text-based coding language in which commands are written to control the movement of a screen turtle.	• Input commands in the Logo tool to make the turtle move in a particular direction towards a goal.
• Commands in Logo consist of directional or rotational commands that include a direction and a distance in spaces or degrees, and operational commands that alter how the output looks or how the code runs.	• Input directional commands (FD, BK, RT, LT) and more abstract, non-directional commands (such as PU and PD).
• Spacing of commands in Logo is important.	• Space commands correctly and debug with a consideration for spacing when errors occur.
• Visual effects can be achieved by using the PU, PD, SETPC and SETPS commands.	• Alter line properties to explore visual effects. • Use the line commands to achieve desired visual effects from the code.
• Logo commands can be repeated a set number of times using the repeat command.	• Identify where the repeat command would be efficient to use. • Create regular shapes using the repeat command. • Anticipate the effect of the repeat when used in example code.
• A procedure is a named set of Logo commands that will be run in the program when referred to by name.	• Write and save Logo procedures. • Call the procedures within their code. • Consider how best to use procedures to make their code efficient.
• Errors (bugs) occur because commands have been input incorrectly. • Fixing the errors is called debugging.	• Make logical attempts to debug Logo code. • Make use of multi-line mode for more complex code to enable easier debugging.

Sound Stories

National Curriculum Links	Dominant objectives for this unit: • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• An audiobook is a story or book read aloud and recorded for people to listen to.	• Explain the differences between an audiobook and a physical book.
• As well as being an enjoyable way to access a story, audiobooks make texts more accessible for a range of people.	• Explain the advantages and disadvantages of an audiobook over a physical book. • Recognise the features that makes an audiobook engaging.
• Audiobooks can be made more interesting by adding expression, different voices, sound effects and background music.	• Identify where a voice or sound effect might make a recorded story more exciting and engaging. • Create a range of sound effects using everyday items. • Use the library of music and sound effects on 2Cast.
• An audiobook script may contain notes on the speaker, the text spoken and how the sound effects are created and used.	• Read and understand cues on an audiobook script. • Contribute to writing a successful script for an audiobook.
• There are specific roles within the group when creating an audiobook with recording software.	• Explain the roles of a narrator, a sound technician, an editor and a sound effects manager. • Take a role within the team and contribute to the recording and editing of an audiobook extract.
• Exciting audiobook narration will contain clear pronunciation, a range of tone and pitch to show emotion, and pauses to create dramatic effect.	• Experiment with a variety of voice tones and effects within the narration of audiobooks, refining the overall effect.
• Editing is the process of polishing and improving an audiobook to ensure it is the best it can be.	• Use the editing tools within 2Cast, including cutting, copy and paste, duplication and moving segments on the timeline.
• Reviewing and evaluating is an important step when creating any digital content including audiobooks.	• Reflect on their work and think about any improvements which could be made using the criteria from the lesson.

Effective Searching

National Curriculum Links	Dominant objectives for this unit: • Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• The internet is a global network of computers that share information from one device to another, anywhere in the world.	• Recognise and find a search engine on the internet.
• We can search for information on the internet using a tool called a search engine.	• Explain the uses of a search engine. • Recognise and name some popular search engines.
• A search engine works by collecting and organising vast amounts of data from webpages across the internet.	• Explain the different stages of how a search engine works to find relevant information.
• Typing in keywords rather than a whole question can be a quicker and more effective way of finding the correct information.	• Select appropriate key words to use in a search to answer a particular question. • Perform a keyword search when looking for information online.
• Search engines send out programs called web crawlers or spiders to explore the web for information. They make a copy of it and store it on their database called an index.	• Explain how information on webpages is gathered, copied and stored by a search engine's program known as web crawlers or spiders.
• When you type a query into a search engine, it searches its index for relevant information and ranks it according to how useful it thinks it is. This is the order in which the information is displayed.	• Explain that when a search is made, a search engine searches through its index rather than through the pages of the internet.
• A search engine bases its ranking on the relevance of the information, the popularity of the website the information is from and whether the business has paid for the information to rank higher. This means the higher ranked results are not always the best.	• Explain how search results are selected and ranked. • Look through search results and evaluate which could be the most useful.

• There are a range of techniques you can use to refine a search query, including using quotes, using the minus sign and using filters.	• Use techniques such as quotes, the minus sign and filters to refine a search query.
• Information can be put online by anyone so we should not take everything we read as fact.	• Explain the importance of questioning where information online has actually come from.
• A fact is something that is true and provable, an opinion is something that someone feels and a belief is something that someone accepts to be true based on their faith or tradition.	• Explain the differences and identify examples of facts, opinions and beliefs.
• Fake news is information that might look real but isn't. Sometimes people make fake news for fun, to make money or try and change the way people think.	• Identify the difference between real news and 'fake news'. • Understand the reasons why someone might want to put fake news online.
• It is important to evaluate the reliability of any information that we find online.	• Check whether information online is reliable and true by checking if it sounds real, checking the source, checking the date and checking if the news is also reported by other sources.

Coding

National Curriculum Links	Dominant objectives for this unit: • 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.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• There are object types in 2Code; these have different attributes (properties) that can be changed in code and design view.	• Change object attributes in design view. • Choose object type with an understanding of the possible object attributes and actions.
• Selection in a program means that it has a decision command that will run different procedures dependent on whether a condition is met or not.	• Interpret flowcharts depicting selection and explain what happens if a condition is or isn't met within it.
• Co-ordinates are used in computer programming to determine the position of a point, shape or object and that these change according to where they are positioned on the screen.	• Identify co-ordinates in Design view. • Change the co-ordinates of objects within the code.
• 'If' statements and 'if/else' statements are used to create selection in 2Code.	• Identify 'if' and 'if/else' control blocks. • Read code that includes selection to determine what the program will do. • Create selection within 2Code using 'if' and 'if/else' statement blocks. • Debug programs that use selection. • Nest an if/else block inside an if/else block to give a user different validation options.
• Programs use different commands including repeat, repeat until and timers to make code loop in a program.	• Use the 'Repeat' command to make a looping program. • Use the 'Repeat Until' command to make a looping program. • Make decisions about whether to use repeat or timers depending upon the program requirements.
• Variables are a place in computer memory that remains for the length of the program. • Variables have a name and a value.	• Create number variables and initialise their values.

• The values can be changed in the code. • Variables are used in programming to keep track of things.	• Change the value of variables within the program by using the 'Change Variable' command. • Use the value of variables within programs. • Use the variable watch to monitor how a variable changes as the program executes code.
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Composing Beats

National Curriculum Links	Dominant objectives for this unit: • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• Music is built of different elements which create the feel and mood. These include the pulse, rhythm, tempo, pitch, melody, texture and dynamics.	• Recognise, demonstrate and explain the different elements of music. • Clap the pulse in a piece of music. • Explain what sounds and instruments they can hear in a piece of music. • Explain what they like and dislike about a piece of music.
• Rhythm is the pattern of long and short sounds and silences in music.	• Identify simple rhythms in everyday life and in music. • Clap back a simple rhythm.
• In digital music, rhythm is made up of sample sounds. • A sample is a short recording of a sound that can be used in music, such as a drumbeat.	• Create their own simple rhythms on Busy Beats by using samples.
• The tempo of a piece of music is how slow or fast it is. • On Busy Beats, the tempo is changed by altering the BPM (Beats per minute).	• Adjust the tempo of a rhythm by changing the BPM.
• The melody is the tune of the music made up of notes. It is the part which can be sung or hummed.	• Identify simple melodies in a piece of music. • Hum or sing back a simple melody.
• In digital music, a melody is made up of synths. These are electronic music instrument sounds.	• Create their own simple melodies on Busy Beats using synths.
• The pitch of a sound is how high or low it is. • In Busy Beats, the higher the number on the synth, the higher the pitch of the note.	• Adjust the pitch of a note using the synth board on Busy Beats.
• A piece of music on Busy Beats is created with a range of samples and synths.	• Experiment with different samples and synths to create a certain feel or mood. • Create and record their own piece of music on Busy Beats.

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| <ul style="list-style-type: none">• A piece of music can be created and arranged on Busy Beats by building up and switching between multiple patches. | <ul style="list-style-type: none">• Create and switch between multiple patches to build up a piece of electronic music. |
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Introduction to Artificial Intelligence

National Curriculum Links	Dominant objectives for this unit: • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• Artificial Intelligence is a type of technology that can make predictions, take actions, and create content, by learning from data.	• Explain what AI is and provide some practical example uses of it. • Explain that AI learns from data and therefore more accurate data will lead to better quality outputs. • Explain what generative AI is. • Describe the different actions AI can perform with examples for: Finder, Personaliser, Assistant, Organiser and Maker.
• In order to communicate effectively with AI, it is important to write clear and precise prompts.	• Highlight key parts of an effective prompt. • Write an effective prompt. • Refine the prompt for clarity. • Test prompts using AI technology such as Goggle AI.
• There are specific behaviours that a user of AI should practise and use to become a good AI digital citizen.	• Identify common characteristics of a good citizen and compare these to the digital world. • Follow the four rules that make good digital citizens when using AI. • Identify which digital citizen rules are being broken in AI based scenarios.
• AI will continue to evolve.	• Explain the ways AI may help in the future with regards to education, transport, travel and the environment. • Explain the importance of human oversight when designing AI tools. • Design an AI tool of the future.

National Curriculum Links	Dominant objectives for this unit: • 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.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• Sensor inputs can be used to detect changes in the environment.	• Explain what the accelerometer is and how it can check for changes in movement. • Explain what the light sensor is and how this can be used to detect light level changes. • Write code that uses light sensors and/or accelerometer inputs.
• Variables are used to keep track of changes in a program and can be used to help with decisions a computer can make.	• Explain that variables hold a value. • Create a number variable in a program. • Change a number variable in a program when an event happens such as an input being received. • Combine the use of a variable value with If statements to make different outputs happen when a value of a variable matches the value set in an If statement.
• Inputs, outputs and computer code work together to make control systems.	• Explain that inputs, outputs and computer code can work together to make simple systems such as a light level detector by using a micro:bit. • Identify the control blocks of code: repeat, if and else. • Identify input code blocks. • Identify output code blocks. • Create a simple piece of code that makes up a control system.
• Logic is used to make different outputs happen depending on changes in data from a sensor.	• Explain that logic is used to make different outputs happen on a micro:bit according to changes from its sensors.

	This logic is created by coding in Free code micro:bit. • Identify that the IF/Else block of code is used to create a form of logic. • Use the IF/Else block of code within a program to create a control system. • Identify that the repeat forever command. • Use the repeat forever command in conjunction with IF/Else block to continually check on a sensors environmental conditions that will change outputs according to environmental changes.
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Declarative and Procedural Knowledge

Year 5

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Introduction

The Declarative and Procedural Knowledge documents are designed to support teachers in understanding the intended learning outcomes of each unit. They outline the specific knowledge and skills that children should acquire and demonstrate by the end of their learning.

- Declarative Knowledge sets out what children will **know**. This includes facts, concepts, definitions, and key ideas that form the foundation of the unit.
- Procedural Knowledge sets out what children will **be able to do**. This focuses on the skills and processes children should develop and apply when using technology.

These documents are used to:

- Provide teachers with a clear overview of learning expectations for each unit.
- Ensure consistency of teaching and progression of knowledge and skills across year groups.
- Support planning, teaching, and assessment by highlighting the essential outcomes to focus on.
- Reinforce the balance between understanding (knowing) and application (doing) in computing.

This document aims to help teachers see the bigger picture of what children will learn, how they will apply it, and how these elements connect across the computing curriculum.

Introduction to Purple Mash

National Curriculum Links	Dominant objectives for this unit: Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
It is important to log in to a site, the importance of keeping passwords safe and the need to log out at the end of a session.	- Access Purple Mash from home and school. - Log out of Purple Mash. - Give reasons why it is important to keep a password safe and not share it with other people.
An avatar is a virtual representation of a person suitable for use online.	Make and edit their own avatar.
The 2Do system is used to set work for children within Purple Mash.	- Open 2Dos. - Save 2Dos. - Hand in 2Dos and communicate with their teacher via the 2Do.
Online sites have a main page called the homepage.	Access the Purple Mash homepage when on the site.
Online sites often use an alert system to communicate with the user.	Access alerts within Purple Mash.
To move to a different activity in Purple Mash, you must close the current activity.	Close activities in Purple Mash.
Many online sites, including Purple Mash, have an area for an individual's work that is accessible only to the individual (and in Purple Mash to their teacher as well).	- Access their work area. - Save work in their work area. - Locate and open work they have done previously in their work folder.
To access Purple Mash programs, you use the Tools area.	Open a specified tool.
To access activities related to a specific topic, you can use the Topics area.	Find activities on a specified topic.
You can access non-visible parts of a screen using scrolling.	Scroll up and down and from side to side where applicable.
Purple Mash includes collaborative tools.	Recommend a tool to use for collaborative group or class work.

Quizzing

National Curriculum Links	Dominant objectives for this unit: • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• There are different types of quiz, suitable for a variety of different purposes.	• Select the best type of quiz to make for any given task.
• Within 2Quiz, there are different types of quiz questions, suitable for different purposes.	• Select the most suitable type of quiz question based on a chosen topic and the question being posed.
• The success of a quiz can be determined by considering how difficult it is, whether it peaks interests and the capability of the audience in relation to the subject matter. • It is also important to consider the enjoyability, visual variety and feedback to the end user when creating a quiz.	• Design successful quizzes that meet a specific brief by making use of the full functionality within 2Quiz.
• Additional features and enhancements, including title screens and content screens can maximise the success of a quiz.	• Explore the additional features, selecting which to use and how to make best use of these.
• Settings, including quiz style, time limits, feedback settings and feedback sounds change the look and feel of a quiz.	• Explore the settings, selecting which to use to create the best outcome for a quiz.

Databases

National Curriculum Links	Dominant objectives for this unit: • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• A database contains a set of data that can be searched and sorted to retrieve information.	• Use the functionality of the 2Investigate database tool to work with data.
• A table-based database contains records and fields.	• Identify, create and edit records and fields of a database.
• Database tools support interpreting data using functionality including sorting, filtering, grouping and searching.	• Sort, group and arrange information in a database. • Search for information in a database. • Answer questions involving the interrogation of a database.
• Collaborative databases allow multiple people to work on one set of data at the same time.	• Add records to a collaborative database. Interrogate the data of a collaborative database.
• A well-designed database has built-in validation to ensure correct data formatting.	• Design a database with validation included.
• Queries can be built using the database tools to answer specific questions about the data.	• Use the query builder to specify conditions for the data returned. • Use conditional operators correctly when building a database query.
• Some table-based databases have multiple tables of related data. These can be linked on common fields to build complex queries across multiple tables.	• Build complex queries across multiple tables to answer questions about the data.
• Databases support the production of automated reports using fields within the data.	• Produce automated reports using fields within the data.

Game Creator

National Curriculum Links	Dominant objectives for this unit: • 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.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• There are criteria which determine the playability of a video game.	• Evaluate the playability of a video game.
• 3D games can be made using the 2DIY 3D tool.	• Make a 3D game using the key functions of the 2DIY 3D game creator tool.
• To maximise playability, it is important to plan and design a game before making it.	• Use a design document to plan the theme and aim, characters and game world, game features, timing, character movement and interaction for a 3D game.
• The visual properties of a game should fit with the theme and add a feeling of immersion to the experience.	• Choose and design appropriate textures for the game world walls, floors, lighting, hazards and scenery.
• The audio properties of a game should fit with the theme and add a feeling of immersion to the experience.	• Choose or compose appropriate sound effects and music for the game.
• The design of baddie sprites and collectable quest items is a key aspect of game creation.	• Design the collectable quest items and add movement, sound effects and actions. • Consider where to place the collectable quest items so it is possible to finish the game. • Place sprites in the game in such a way as to provide challenge but not make it impossible to play. • Select appropriate penalties for encountering an enemy.
• It is important to give the player good instructions to enable them to enjoy playing the game.	• Create useful instruction screens for players.
• Evaluation is important so a game can be improved.	• Evaluate games made by their peers using given criteria. • Read evaluations of their game from others. • Make appropriate improvements to their game.

Spreadsheets

National Curriculum Links	Dominant objectives for this unit: Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the students will know that:	Procedural – By the end of the unit the students will know how to:
A spreadsheet is a digital tool for storing, organising and analysing data.	Enter data accurately into cells, using rows, columns and headings appropriately.
Cells, rows, columns and cell references provide a structure for organising information.	Select, navigate and reference cells to build formulas and structure spreadsheets clearly.
Formulas allow spreadsheets to perform calculations automatically, including addition, subtraction, multiplication, division.	Create and edit formulas (e.g. =A2*B2, =A3+B3) and apply them across cells to update calculations efficiently.
Conversions rely on known mathematical relationships (e.g. cm–m, mm–cm, g–kg).	Apply conversion formulas within spreadsheets to automate unit changes.
Line graphs are used to represent continuous data and show trends over time.	Create line graphs in 2Calculate by selecting relevant data, choosing a suitable scale, and labelling axes clearly.
Continuous data changes smoothly over time, while discrete data represents separate, countable values.	Sort data into continuous or discrete categories and choose the correct type of graph or representation for each.
Weather data contains measurable patterns that can be compared and interpreted.	Input weather datasets and analyse them to identify trends, make predictions or determine risks.
Budgets are used to plan money, compare costs and make financial decisions.	Use totals and calculations to compare event costs and stay within a set budget.
Spreadsheets help solve real-world problems by presenting information clearly and accurately.	Use spreadsheets to plan an event, analyse weather, or cost a holiday, making justified decisions based on evidence.
A good spreadsheet is clear, well-labelled, accurate and structured logically.	Format spreadsheets with headings, consistent layout, neat tables and correctly labelled graphs to improve readability.

Coding

National Curriculum Links	Dominant objectives for this unit: • 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.
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Declarative - By the end of the unit the students will know that:	Procedural – By the end of the unit the students will know how to:
• The way that code is written and structured can improve the ability to debug it, simplify the code and run it more efficiently.	• Use tags to write code for several objects in one block of commands facilitated by the computer-generated variables for tagged objects. • Use tabs to organise code. • Use functions to reduce the need to repeat blocks of code and make the program easier to read.
• A simulation is a model that represents a real or imaginary situation.	• Explain what a simulation is and provide examples of physical systems that could be made into a simulation. • Plan an algorithm for a physical system such as traffic light sequences using 2Chart. • Use the algorithm to write the code. • Test and evaluate the program. • Use the program to model changes to the physical system for instance improvements if there are traffic jams at the lights.
• Abstraction is a way to think about a situation without unnecessary details, enabling a focus on the function of a program.	• Recognise what abstraction is and why it is important. • When planning a program, use abstraction to focus thinking on the task itself.
• Decomposition is a method of breaking down a task into manageable components. This makes coding easier as the components can then be coded separately and then brought back together in the program. Each part is known as a sub-routine.	• During planning, use decomposition to break down the plan into the key parts that are required to get the program functioning. • Use decomposition as a way to organise the code. For example, using tabs in 2Code. • Use 2Chart to create a flowchart that contains sub-routines.

• A function is a named group of commands that a program can run when called by name; reducing the need to rewrite code repeatedly.	• Create functions in 2Code and call these functions appropriately instead of repeating code. • Refine existing code to include functions by recognising where code is repeated within the program.
• A datatype defines the type of data, for example, a number or text, and what operations can be performed with it.	• Make sensible choices of datatype when creating variables. • Anticipate the effect of operators on the variable values given their datatype. • Use the Variable Watch window to monitor the changing value of the variables in a program.
• It is important to initialize variable values to avoid unanticipated bugs in the program.	• Initialize all variables appropriately. • When debugging, look at the variable data type and initialization as possible sources of bugs.
• Concatenation is the name given to the action of linking things together in a series. For example, in programs we might want to link words together to form random phrases that are seen by a user of a program.	• Recognise where concatenation can be useful in programs. • Use the print to screen command in combination with random words that are joined together to demonstrate concatenation. • Demonstrate concatenation in other programs created such as linking a variable (score) with text (well done) for a game. • Debug programs that involve concatenation errors in strings.

Word Processing

National Curriculum Links	Dominant objectives for this unit: Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the students will know that:	Procedural – By the end of the unit the students will know how to:
A word processing tool can be used to create a range of documents.	- Recognise different documents that can be produced using a word processor. - Open new blank documents and existing documents. - Identify a range of templates that can be used to create documents. - Navigate around the main toolbar including sub-toolbars for individual objects. - Expand toolbar categories to show additional options. - Save a document and rename it. - Select specific words to format. - Type sentences and then format them accordingly.
The layout of a document can be altered.	- Switch between portrait and landscape mode. - Change the margins.
Images can be inserted and edited in a word processor.	- Search for images online or using stock images. - Download images to a document. - Edit an image using the image handles. - Crop and resize an image. - Wrap text around an image. - Use the various options to change the appearance of an image.
The look and placement of text within a document can be modified.	- Use appropriate keyboard or touchscreen shortcuts for copy, paste and cut. - Use the text formatting toolbar to change the text within the document. - Add headings and subheadings to a document. - Use a range of bullet points including numbered lists. - Use bold, underline, italic formatting options purposefully.

	• Use a range of font choices to suit a document's purpose.
• Tables can be used to present information within a document.	• Insert a table. • Add in columns and rows to a table. • Distribute rows and columns in a table. • Choose table borders. • Change the background colour of a cell in a table.

Coding: External Devices

National Curriculum Links	Dominant objectives for this unit: • 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.
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Declarative - By the end of the unit the students will know that:	Procedural – By the end of the unit the students will know how to:
• External devices can be used to control a coded program.	• Write if something is an output or an input. • Define what an external device is. • Start coding using external device code blocks. • Use a QR code to connect an external device. • Play their simple code.
• An external device can be used as a game controller.	• Talk about the features of a game controller. • Complete a partially made game. • Debug their code if it isn't working.
• Text can be outputted to an external device.	• Find blocks relating to graphics and text. • Choose blocks to output text to the external device. • Write a program to code text to a device.
• An external device can be used to model real life situations.	• Recognise when an external device can use sensors and how these can be used in code. • Find blocks relating to sensors in the external device (namely shake, tilt and sound detected). • Plan and code a program using sensors.
• A program can be written for the external device to meet a specific design brief.	• Plan out a program before they start to code. • Code a program written for a specific purpose. • Debug their code if it isn't working. • Share a program with others. • Evaluate a program and make improvements where needed.

National Curriculum Links	Dominant objectives for this unit: • 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.
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Declarative - By the end of the unit the students will know that:	Procedural – By the end of the unit the students will know how to:
• Inputs from an accelerometer, button, pin or sound can be used to initiate a program.	• Identify event blocks. • Code using an event block to initiate a program. • Nest code that is to be run inside an event block.
• Inputs from the micro:bit can be used by the program to control the output from the micro:bit. This can simulate control systems.	• Write code that takes actions dependent upon what is being sensed as an input e.g. the temperature. • Identify input code blocks and use them. • Identify output code blocks and use them. • Create a simple piece of code that simulates a control system. • Use 'if' statements to introduce selection. • Combine events, output and variable code blocks to produce code that makes a micro:bit change its output based on environmental changes.
• External equipment, such as crocodile clips and electronic circuitry can be attached to the micro:bit to initiate actions in the program that can produce outputs.	• Connect crocodile clips to the micro:bit pins anticipating what action will initiate input to the micro:bit. • Write code that responds to input on the pins.
• Variables can be used to track changes in a program and help with logic.	• Create a number variable. • Initialise a variable value. • Change a variable value when an event is detected. • Use If statements to check the current value of a variable. • Produce outputs based on the variable value.



Declarative and Procedural Knowledge

Year 6

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Introduction

The Declarative and Procedural Knowledge documents are designed to support teachers in understanding the intended learning outcomes of each unit. They outline the specific knowledge and skills that children should acquire and demonstrate by the end of their learning.

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These documents are used to:

- Provide teachers with a clear overview of learning expectations for each unit.
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- Reinforce the balance between understanding (knowing) and application (doing) in computing.

This document aims to help teachers see the bigger picture of what children will learn, how they will apply it, and how these elements connect across the computing curriculum.

Introduction to Purple Mash

National Curriculum Links	Dominant objectives for this unit: Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
It is important to log in to a site, the importance of keeping passwords safe and the need to log out at the end of a session.	- Access Purple Mash from home and school. - Log out of Purple Mash. - Give reasons why it is important to keep a password safe and not share it with other people.
An avatar is a virtual representation of a person suitable for use online.	Make and edit their own avatar.
The 2Do system is used to set work for children within Purple Mash.	- Open 2Dos. - Save 2Dos. - Hand in 2Dos and communicate with their teacher via the 2Do.
Online sites have a main page called the homepage.	Access the Purple Mash homepage when on the site.
Online sites often use an alert system to communicate with the user.	Access alerts within Purple Mash.
To move to a different activity in Purple Mash, you must close the current activity.	Close activities in Purple Mash.
Many online sites, including Purple Mash, have an area for an individual's work that is accessible only to the individual (and in Purple Mash to their teacher as well).	- Access their work area. - Save work in their work area. - Locate and open work they have done previously in their work folder.
To access Purple Mash programs, you use the Tools area.	Open a specified tool.
To access activities related to a specific topic, you can use the Topics area.	Find activities on a specified topic.
You can access non-visible parts of a screen using scrolling.	Scroll up and down and from side to side where applicable.
Purple Mash includes collaborative tools.	Recommend a tool to use for collaborative group or class work.

Networks

National Curriculum Links	Dominant objectives for this unit: • 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.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• A network describes a group of connected computers that can share information and hardware resources.	• Identify types of computer networks locally and globally. • Explain the hardware resources that a network might share.
• LAN and WAN are different kinds of networks.	• Explain the difference between LAN and WAN.
• Certain hardware is required to create a network.	• Create a network diagram that includes hardware such as a router and different connected devices and peripherals.
• Networks can be wired or wireless or a combination of both.	• Identify the terms Wi-Fi, mobile data and 5G as pertaining to wireless network connections.
• There is a difference between the World Wide Web and the Internet.	• Describe the difference between the Internet and World Wide Web giving examples of the services that both provide.
• Web browsers are used to access the World Wide Web.	• Give examples of web browser tools.
• The existence of networks has opened online communication.	• Give examples of online communication. • Give safety tips related to online communication
• Internet filtering and censorship are both used to make parts of the internet less accessible for different reasons.	• Explain the differences between internet filtering and censorship and why they are used.

Graphing

National Curriculum Links	Dominant objectives for this unit: Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
Graphing helps to make sense of datasets and draw conclusions related to the collected data	Create a variety of graphs and interpret these to draw conclusions.
There are different types of graphs. The data and the question that needs answering will determine the best graph type to produce.	Create a variety of graph types and determine the best format to represent specified data.
Comparative bar charts can be used to visually compare several datasets.	- Create a comparative bar chart using the 2Graph tool. - Present the graph with a title, key and axis labels.
Graphs can be exported from a graphing tool such as 2Graph and imported into other documents.	Export graphs from 2Graph and import them into a 2Publish file.
Pie charts represent data as parts of a whole.	- Use 2Graph and 2Calculate to create pie charts and then interpret what they show. - Compare the use of each tool in relation to graph production.
Line graphs are used to represent the relationship between two variables as they change over time.	- Decide when a line graph would be the most appropriate graphing format. - Create line graphs and use a graphing tool to add titles, labels and select the best scale for display. - Create line graphs showing multiple datasets and use these to draw conclusions about the data.

Blogging

National Curriculum Links	Dominant objectives for this unit: • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• A blog is a regularly updated webpage, written about a particular topic.	• Give examples of topics for existing or prospective blogs.
• Blogs consist of several blog posts.	• Create a blog post.
• A well written blog post has certain features that make the blog clear and easy to understand and increase reader engagement.	• Plan the hook, look and feel, conclusion and reader engagement for a blog post.
• The 'hook' draws the reader into the blog.	• Use an appropriate hook for a blog post by including either a quote, a story, a question or an observation to grab the reader's interest.
• The look and feel of a blog post makes it clear for the reader to access the information.	• Write a blog post that is easy to follow, uses lists or bullets, bolds key information and uses an appropriate conversational style.
• The conclusion of a blog post ties the information in the post together.	• Write a conclusion that summarises the main points of the post and might give the reader advice.
• The process of writing a blog post requires planning, drafting, revising and editing before publication.	• Follow the plan, draft, revise and edit process before publishing a blog post.
• Engaging with readers is crucial to the success of a blog.	• Read and respond to comments on their blog post. • Use commenting to increase engagement and guide future blog posts.
• Moderation exists to make the blogging environment a safe place for its readership and authors.	• Decide whether content conforms to appropriate netiquette guidance. • Report posts or comments that violate community or legal guidelines.

Data Detectives

National Curriculum Links	Dominant objectives for this unit: • Select, use and combine a variety of software on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• A database contains data organised in such a way that it can be queried to find useful information.	• Identify tables, records and fields. • Explain the data types contained within each field on a record. • Identify any format types applied to fields. • Use query tools to find useful information.
• Query tools exist to help users of a database find information from data stored within it.	• Use the filter tool to create conditions. • Use the grouping tool to group related information together as part of a query. • Use the calculate tool to apply calculations to selected data that provides meaningful results. • Use the sort tool to change the order records are presented according the field selected and the value order (increase/decrease).
• Chart tools can be used to make graphs from data contained within a database.	• Use the chart tool to select specific fields from a database for the x and y values on a graph. • Select the most appropriate graph type to display selected data so it makes sense in relation to a query given.
• Some databases will need multiple tables of data.	• Identify differences in data held in individual tables that make a complete database. • Explain why the data can't be all held on one table.
• Queries can be created that query data from multiple tables.	• Link tables together by using a common field. • Produce queries that query data from linked tables.
• Bespoke multiple conditions can be made that help a user find the exact information being asked.	• Create multiple condition and can join those using the AND/OR operator. • Use the AND/OR operator correctly and recognise the difference between the two and the impact this has on results when run. • Use brackets to contain multiple conditions and apply a general condition that applies to all conditions made.

Coding

National Curriculum Links	Dominant objectives for this unit: • 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.
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Declarative - By the end of the unit the children will know that :	Procedural – By the end of the unit the children will know how to :
• Cloning is a process where additional objects can be created while the program is running.	• Write code to clone objects and loop through the clones to change their attributes.
• Objects can be draggable in 2Code to provide another way for the user to interact with them.	• Make objects draggable in a program.
• Hotspots can be created in 2Code. These are a type of object that can be used to make a specific area of the screen react to actions such as objects entering or leaving the area.	• Create hotspots and write code that controls the flow of the program when objects enter and leave hotspots.
• Using a combination of coding structures and objects allows the design of interactive and creative programs.	• Use code to create effects when combining the use of draggable objects, hotspots and cloning in conjunction with sequences, repetition and selection.
• Variables can have different designated datatypes. The datatype will impact how the value of the variable can be used.	• Make conscious choices about datatype when creating variables. • Anticipate effects such as calculating using variable values, concatenation of string variables and bugs that could occur due to datatypes when user input is used.
• There are a variety of ways of receiving input from users and then using this input.	• Use 'Prompt for input' and 'get input' commands to receive input from the user of a program and write code using variables to work with user input. • Use if statements that include checking of a value of a user input and changing a variable if user input has met the if statement condition.
• A flowchart is a diagram that uses specifically shaped, labelled boxes and	• Interpret flowcharts and use these as a basis to begin coding or debugging a program. • Create flowcharts to represent algorithms.

arrows to represent an algorithm as a diagram.	• Include sub-routines within flowcharts to help with more complex program ideas.
• Using functions helps with making programs more efficient. Instead of writing the same sequence of code repeatedly	• Create functions and write code for function calls. • Interpret programs that include functions to explain the purpose of the function.
• Design documentation is vital when producing more complex programs. The process of designing supports abstraction and decomposition of the task at hand.	• Interpret design documentation, commenting on the level of abstraction and the way that a task has been decomposed. • Use user interface designs to create the look of a program. • Use flowcharts to decide upon the structure of a program and what functions might be required.
• Text-based adventures are computer games that have been created using text instead of graphics. Players use text commands to control characters and influence the environment.	• Review the code of a text-based adventure game and relate this to game play when the code is running. • Identify how variables, functions, selection and repeat loops are used to make the program function. • Adapt the code maintaining the structure but changing the game play.

Introduction to Python

National Curriculum Links	Dominant objectives for this unit: • 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.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• Python is a text-based coding language.	• Use language syntax correctly for simple programs which includes the use of brackets, quotes, indents and correct case letters.
• Python has in-built functions that can be used.	• Use the print function to output strings, values of variables or a combination of both.
• A library of functions can be imported into a program to use.	• Import the sleep function from the time module within Python's library.
• A sleep function can be used to control how a program is executed.	• Use the sleep function to control the speed of execution of lines of code when printing outputs to the screen.
• There are two main types of loop in Python and that these can be used to improve coding efficiency.	• Use a 'for loop' to repeat a block of code for a specified time. • Explain the difference between a 'for loop' and a 'while loop'.
• Range is a function that lets a coder in Python get a series of numbers or specifies how many times a loop is to run.	• Use the range function in a 'for loop' to specify how many times that loop is to run. • Use the range function to start from a given number and end on a given number.
• Python can be used to perform mathematical calculations.	• Use mathematical operators with numbers to print answers to calculations to the output window.
• Sprites can be programmed to move to positions on the screen.	• Use design mode to select sprites to place on the screen. • Use coordinates to identify the position of a sprite. • Program a sprite to move to different places on a screen by using co-ordinates to identify current and intended location.

Spreadsheets (Microsoft, Google and Apple)

National Curriculum Links	Dominant objectives for this unit: • Select, use and combine a variety of software on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• There are key features of a spreadsheet, and data can be entered into cells.	• Talk about some uses of a spreadsheet. • Navigate around the front screen of their chosen program. • Navigate around a sheet using appropriate cell references. • Enter data into cells of the chosen program. • Recall key vocabulary relating to spreadsheets.
• Formulae can be entered into a spreadsheet, this can save time and make working more efficient.	• Define what is meant by a formula on a sheet. • Navigate around a sheet by clicking in a cell or typing cell reference. • Write simple formula related to the rules of calculation. • Use the series fill function. • Use formulae to change calculations automatically when data entered is changed.
• Spreadsheet software can make complex data clear by manipulating the way it is presented.	• How to change the height and width of a cell and row. • Enter header titles into a sheet. • Split cells for ease. • Sort data in a sheet using the appropriate feature.
• A spreadsheet can be used to model a situation.	• Use the sum feature when typing a formula. • Format cells as currency. • Use a computational model in a real-life situation.
• Functions can be used for calculating averages and maximum and minimum values in spreadsheets.	• Add data to a table format. • Create formulae using cell references. • Use more advanced formula other than SUM
• A spreadsheet program can display a variety of graphs and charts.	• Recap the knowledge of the different axis in a graph based on learning in other subjects. • Create a range of graphs and charts depending upon the version being used.

Using sorting and filtering tools can allow you to interrogate large amounts of data quickly and easily.	- Sort data in a sheet by alphabetical or numerical order. - Use and apply a variety of text and number filters. - Explain that rows that do not meet the criteria are not deleted; they are temporarily hidden from view. - Clear the filters after a search to make the hidden rows visible again.
A spreadsheet can be created to model a real-life situation and solve problems.	- Understand the advantages of using formulae when data is liable to change. - Plan an event using a spreadsheet. - Use the skills gathered over the unit to solve a series of problems.

3D Modelling

National Curriculum Links	Dominant objectives for this unit: • Select, use and combine a variety of software on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• Designers use CAD (Computer Aided Design) to create accurate drawings or 3D Models on a screen.	• Define what a 3D model is. • Identify different industries where CAD is used.
• CAD allows designers to create accurate and flexible designs, allowing them to test out ideas and spot problems before something is built in real life.	• Identify the benefits of using CAD. • Explain how CAD is used in a variety of industries such as car manufacturing, architects and creating packaging.
• 2Design and Make is the CAD software on Purple Mash which allows users to develop a range of 3D models.	• Use 2Design and Make accurately, select models which fit their design best and adapt them where necessary. • Spot problems in their own 3D models on 2Design and Make and make adaptations where necessary. • Add textures to the model using the painting tools. • Use the design slider to alter the width of the model.
• There are three viewpoints on 2Design and Make; Points view, Net view, and 3D view.	• View a model from each viewpoint. • Use each view to better their models, making use of the editing tools within each viewpoint.
• The pattern fill tool allows you to design a repeated pattern to add to your model.	• Create repeated patterns that suit the model. • Add patterns into small sections of their model design.
• Moving, adding and removing points on a model allows the designer to manipulate the shape to meet the desired design.	• Change the location of the points to alter the appearance of the model. • Add and remove points to manipulate the shape of their model to meet a purpose.
• A prototype is a first version of a design which is designed and made to test out ideas.	• Explain why a prototype is used in a range of industries before a real product is created.
• CAD can be used to create a prototype for packaging for a product.	• Explain how creating a packaging prototype is useful.

• Packaging is important to protect a product, give information, promote the product, attract customers and make the product more convenient to carry, use and store.	• Recognise a range of different packaging designs and shapes and think about how effective they are. • Discuss how packaging is used in a variety of ways.
• A design brief is a set of instructions or a challenge that explains what needs to be designed.	• Explain why design briefs are important. • Plan a design for a model to meet a design brief – a piece of packaging for a healthy snack.
• Models need to be refined before they are printed out using a standard printer or 3D printer.	• Refining a model is important prior to the final printing process. • Print their model onto paper/card or via a 3D printer. • Construct their 3D model if appropriate.
• A 3D printer can print a physical object from a 3D digital model, typically by laying down many thin layers of material in succession. It requires a STL file.	• Identify the differences between a standard printer and a 3D printer. • Identify a STL file. • Discuss the use of 3D printing in different industries. • Discuss the types of materials that 3D printers can use to create a physical object.

Binary

National Curriculum Links	Dominant objectives for this unit: • 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.
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Declarative - By the end of the unit the children will know that:	Procedural – By the end of the unit the children will know how to:
• Binary is a number system using only the integers 1 and 0. It is also known as base-2.	• Compare the integers used in decimal to those used in binary.
• In day-to-day life, we use the decimal system, also known as base-10 and denary.	• Compare the integers used in decimal to those used in binary.
• Binary is how data in a computer is saved and processed to make everything happen.	• Explain that the 0 and 1 integers in binary relate to the millions of switches within the computer being in an off state (0) or and on state(1). • Recognise when information is transferred and turned into action. For example, the letter 'A' appearing on the screen when the user types 'A' on the keyboard.
• A bit is the most basic unit of information in computing.	• Represent a single bit as a value of either a 0 or 1.
• The sequence of bits doubles each time e.g. 1,2,4,8,16,32	• Create decimal values by adding bits together.
• It is possible to count from 0 to infinity using binary.	• Count in binary using equipment such as binary cards to support them.
• All decimal numbers can be converted into binary.	• Convert decimal numbers to binary using the divide-by-two method.
• When coding, binary game states are often used to control the flow of the program, these values are stored using variables.	• Describe where coded programs might have used binary game states to control the flow. • Make a simple program that uses variable values of 0 and 1 to control the flow of the program.