Declarative and Procedural Knowledge

Year 4

Contents

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.

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.

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.

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.

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.

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.

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, options 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.

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.

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**:
• 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.

• A piece of music can be created and arranged on Busy Beats by building up and switching between multiple patches.	• Create and switch between multiple patches to build up a piece of electronic music.

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.

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**:
• 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.