Declarative and Procedural Knowledge

Year 1

Contents

Introduction

It is important to note that for simplicity and to demonstrate strand coverage, units have been put into their 'best fit' strand as per the Scheme of Work Overview document.

Key Stage 1

- In many units, children will be furthering online understanding and concepts of technology (DL) through making digital content (IT and CS)

Key Stage 2

- Children will be understanding of the capabilities of the World Wide web (CS) while searching online (IT).
- They will be developing their understanding of appropriate behaviour online (DL) skills while learning about searching the Internet (IT).

Both Key Stages

- At all times children will be learning about using technology safely and respectfully (DL).
- In most units for all strands, children will be developing their general information technology skills (IT).
- This overlap, repetition and reinforcement helps to give children a deeper understanding of the knowledge and skills across all strands and of their integrated nature in the real-world.

*For more detailed information to assess pupils, see the assessment statements at the end of each unit and repeated in the Assessment document for each year group.

Unit 1.1 – Online Safety

NATIONAL CURRICULUM LINKS	**Dominant strand for this unit: Digital Literacy** • Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. **There will be elements from the other two strands due to the nature of the computing curriculum.**

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**:
• It is important to log in to a site safely and the importance of keeping passwords safe.	• Access Purple Mash from home and school. • Give reasons why it is important to keep a password safe and not share it with other people. • Explain why passwords display as ****** on the screen.
• Many online sites, including Purple Mash, have an area for their work that is accessible only to the user.	• Access their work area. • Sort their work using a folder system. • Save work in their folder.
• An avatar is a virtual representation of them suitable for use online.	• Make and edit their own avatar. • Consider why an avatar is better than a photo for an online account.
• Work can be loaded and saved in an online area in platforms children have access to, including Purple Mash, can be accessed by teachers.	• Locate work they have done previously in their work folder. • Listen and read teacher comments. • Open the file by double clicking on it.

• Online platforms, such as Purple Mash, have search functionality which allows users to efficiently find resources and tools.	• Locate the search bar. • Explain why search is more efficient than just looking through all the resources. • Search for a given resource. • Double click to load the resource up.
• Different icons in a tools bar carry out different functions.	• Know how to load a specific resource on Purple Mash • Recognise the tools in the toolbar at the top of the program. • Use a variety of tools. • Add images. • Complete a writing frame. • Save their work in their work folder using an appropriate file name.
• Many of the tools in sites such as Purple Mash will have a common design theme, and which means familiarity of the functionality of icons across different applications.	• Recognise the common icons for New, Open, Save, Export, Print and Share. • Begin to use these icons in their work.
• It is important to log out when they have finished working as a way of securing personal accounts.	• Identify the drop-down menu containing the Log Out icon. • Log out of a program, in this case Purple Mash, as a way of protecting their work and stopping others using their account.

Unit 1.2 – Grouping & Sorting

NATIONAL CURRICULUM LINKS	**Dominant strand for this unit: Computer Science** • Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. **There will be elements from the other two strands due to the nature of the computing curriculum.**

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**:
• Items can be sorted using a range of criteria. When sorting items, a logical process should be used.	• Describe physical items that are needing to be sorted thinking about all the different ways they could be described. • Identify criteria that can be used to sort items into two groups. • Explain how items have been sorted. • Check that items sorted into two categories are correct using the criteria decided upon.
• An algorithm is a precise, step-by-step set of instructions used to solve a problem or achieve an objective. Computer programs need clear instructions, in steps, to follow. The instructions written for a computer program are called algorithms. Humans can follow algorithms to sort items such as shapes, just as computer programs can.	• Look at an algorithm a human has followed to sort shapes and compare it to the algorithm a computer program has used to identify if the shapes are correctly sorted. • Follow a human algorithm to sorting shapes. • Follow a computer program algorithm checking shapes have been sorted correctly.

• Computers can be used as a way of sorting on screen objects.	• Open a sorting activity within Purple Mash. • Become familiar with the layout of computer sorting activities recognising items that need sorting and the areas they can be moved to. • Identify what each criterion container is. • Drag objects into the correct criterion container. • Recognise some objects may fit into an overlap criterion.

Unit 1.3 – Pictograms

NATIONAL CURRICULUM LINKS	**Dominant strand for this unit: Information Technology** • Use technology purposefully to create, organise, store, manipulate and retrieve digital content. **There will be elements from the other two strands due to the nature of the computing curriculum.**

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**:
• Data is a collection of information, used to help answer questions.	• Collect data on a common theme such as how children travel to school. • When collecting data, recognise that there are efficient ways of collecting data such as writing it down or entering it into a computer program.
• A pictogram is a visual way of representing data.	• Represent data collected as a class using physically created pictograms. • Interpret a pictogram by comparing amounts of different categories.
• We can look at data represented in pictograms and ask questions as a way of interrogating data.	• Interrogate a pictogram by thinking of questions that we would like answers to. • Look at a pictogram and compare each category. • Identify the totals in each category.
• Programs such as 2Count enable people to create pictograms on a computer. This has the advantage of being able to easily modify data and share it with lots of people.	• Open 2Count. • Increase or decrease amounts of items from a column by using the plus or minus buttons. • Change an image representing a piece of data. • Create a suitable title for a pictogram. • Save a pictogram.

Unit 1.4 – Lego Builders

NATIONAL CURRICULUM LINKS	**Dominant strand for this unit: Computer Science** • Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. **There will be elements from the other two strands due to the nature of the computing curriculum.**

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**:
• To achieve a specific effect when building something, accurate instructions must be followed.	• Recognise whether instructions have been followed correctly when comparing two Lego models. • Give clear, precise and concise building instructions for someone to follow. • Recognise how important it is to have clear, precise and concise instructions and the implications of this. • Test that instructions have been followed by comparing the results of something built with the instructions.
• Computer programs need precise instructions to follow and these are called algorithms. If instructions are vague, outcomes will vary for any given task.	• Open a painting activity on Purple Mash. • Follow the simple instruction of painting given animals and compare the finished results with others recognises differences due to limited instructions given. • Follow a set list of instructions that everyone uses to paint a bird, recognising that the instructions have resulted in everyone's finished pieces are very similar.
• The order of instructions for a task affects the results.	• Identify why a sequence of instructions for making a sandwich is incorrect. • Explore the possible outcomes of following incorrectly sequenced instructions.

• Correcting errors in an algorithm or program is called debugging.	• Find simple errors in a simple algorithm for making a sandwich. • Correct the 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.

Unit 1.5 – Maze Explorers

NATIONAL CURRICULUM LINKS	**Dominant strand for this unit: Computer Science** • 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. **There will be elements from the other two strands due to the nature of the computing curriculum.**

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**:
• You can move a character (turtle) within specific computer programs around a computer screen such as 2Go by using direction keys. When a direction key is used it is known as a command.	• Open 2Go and be familiar with its environment. • Use the direction keys to make a character (turtle) on the screen move in different directions. • Experiment with moving the character using alternative routes to get it to a desired location.
• On screen direction keys can have eight possible directions which includes diagonal movements.	• Make use of diagonal key commands when moving a character to help move the character to a desired location with the least number of commands. • Combine diagonal commands with standard four direction commands and number keys to efficiently move a character to a desired location.
• Number keys can be combined with direction keys to give a program more accurate instructions and avoid less command clicks. Each square on a grid relates to 1 unit and that when using number keys this should be referenced.	• In 2Go use the direction keys combined with number keys to get an object to a specific place on a screen. • Reference an onscreen grid with number keys when creating commands.

• Lists can be made with directional instructions within 2Go and these are known as algorithms. These lists can be changed to improve the instructions which is known as debugging.	• Identify where a character needs to go. • Formulate a list of instructions to move the character from the start to end point. • Drag instructions into the algorithm box. • Run the instructions and test they achieve the correct result. • Debug by modifying the instructions so that the character moves to the correct location. • Make use of the undo button to help with changes to commands. • Use the extend algorithm button when more than five commands are needed.

Unit 1.6 – Animated Stories

NATIONAL CURRICULUM LINKS	**Dominant strand for this unit: Information Technology** • Use technology purposefully to create, organise, store, manipulate and retrieve digital content. **There will be elements from the other two strands due to the nature of the computing curriculum.**

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**:
• There are differences between traditional books and e-books.	• Identify differences and similarities between traditional books and e-books. • Explain the advantages of both formats of books and why one format might be favoured over the other in some instances. • Identify 2Create a Story as an e-book creator tool.
• Images can be created within e-book software.	• Open 2Create a Story and explain what the common tools such as eraser, undo/redo do and the textured pens. • Use the textured pens to create a drawing. • Use the eraser, undo/redo buttons when creating the image if a mistake is made. • Save the 2Create a Story file.
• Animations can be included in e-books.	• Open previously saved work from within 2Create a Story. • Identify the animation tool. • Test each animation effect within the animation tool for a selected image. • Apply an animation effect. • Use the play button to see the effect of the animation within the e-book.

• E-book software allows pages to be added and overwriting of work.	• Overwrite any work that was done previously if needed such as changing an image. • Add additional pages using the add page button. • Scroll between pages using the back and forward arrows. • Save any new changes.
• Audio such as sound effects, voice recordings and music can be included within e-books.	• Open previously saved work from within 2Create a Story. • Locate the sound button. • Record sound using the microphone and apply to a page. • Insert a sound effect from the gallery and apply to a page. • Insert a piece of music created from the piano synthesizer and apply to a page. • Test the effects of adding sound by clicking the play button.
• Backgrounds can be included in e-books to help engage an audience.	• Open previously saved work from within 2Create a Story. • Locate the clip art gallery icon. • Select a background for a page from the gallery. • Create a background for a page using the pen tools. • Locate the camera icon and use this to apply an image taken from a camera as a background to a page.
• Text fonts and sizes can be changed in e-books to suit an intended audience.	• Select previously written text from a file. • Locate text button. • Experiment with changing the font type, colour and size. • Apply any text changes to a page that contains text.
• Copy and paste features in e-book software can be used to speed up creation of additional pages.	• Open previous work within 2Create a Story. • Locate the copy button. • Select copy to perform a copy of a page. • Use the next page button to locate where the copied page should be pasted. • Locate the paste button. • Click on the paste button to insert the copied page. • Modify the copied page.

Unit 1.7 – Coding

NATIONAL CURRICULUM LINKS	**Dominant strand for this unit: Computer Science** • 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. **There will be elements from the other two strands due to the nature of the computing curriculum.**

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**:
• Tasks can be given to people and computers by using instructions. Computer programs work by following instructions called code known as algorithms. In both cases, these need to be clear and concise.	• Give clear instructions that others can follow. • Receive instructions that others can follow. • Draw symbols to represent instructions. • Can recognise an object in printed code block form. • Can recognise an action in printed code block form. • Can arrange a printed object block next to a printed action block e.g. 'Tuna left'. • Can recognise the set of code blocks arranged to create actions is known as an algorithm.
• There are objects and action code block in the 2Code environment and that you can make a simple program using these. Each single instruction such as 'Object Right' is called a command.	• Recognise object code blocks in 2Code. • Recognise action code blocks in 2Code. • Make a command in 2Code by using an object and action together. • See what happens when a command they have made is executed.

• An event is something that makes a block of code run such as a user pressing a key or clicking a screen. Event, object and action code blocks can be used together.	• Recognise **When Clicked** code block as an event block. • Arrange a **When Clicked** code block in front of an object. • Give an object code block an action when it is clicked. • Run code with a **When Clicked** event and observe what happens when the event occurs.
• When code is run this is known as code being executed.	• Execute code by clicking the Run button. • Stop code executing by clicking the Stop button. • See the colour change on blocks of code being executed.
• Debugging is when we fix code that isn't working how it was designed to.	• Analyse where their code isn't working properly. • Arrange blocks into different places. • Change actions attributed to objects. • Can execute code and test if changes have debugged a simple program.
• Scenes can be made using backgrounds and objects. Backgrounds can be changed as well as objects and that these have attributes (properties) that can be modified.	• Switch to design view. • Select a background using the background icon. • Click on an object and change the size of it by changing the value of the scale. • Move an object where wanted within design view by clicking and dragging it. • Delete an object by clicking on it and then on the bin.
• A well thought out program should be made from a plan.	• Draw a plan of a scene with objects. • Plan what the objects in the scene will do. • Create a program from a plan that includes objects, actions and a **When Clicked** event. • Execute the program and test if it is doing what is intended in the plan. • Debug the program if the program isn't working how it was planned.

Unit 1.9 – Tech Outside School

NATIONAL CURRICULUM LINKS	**Dominant strand for this unit: Digital Literacy** • Recognise common uses of information technology beyond school. **There will be elements from the other two strands due to the nature of the computing curriculum.**

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**:
• Technology is science and engineering knowledge put into practical use to solve problems or invent useful tools.	• Recognise technology. • Identify common types of technology such as electronic devices. • Describe the function of common types of technology.
• Technology is used within school.	• Identify technology within school. • Describe the function of technology examples within school. • Explain how this technology is helpful.
• Technology is used outside of school.	• Identify technology outside school. • Describe the function of technology examples outside school. • Explain how this technology is helpful.