Declarative and Procedural Knowledge

Year 6

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 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, 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.

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 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.

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**:
• 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.

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 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.

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 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.

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.

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**:
• 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.

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.

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**:
• 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.