# Computing

At Norton Community Primary School

The intent of our computing curriculum is to provide our pupils with the following:

- Competence in coding for a variety of practical and inventive purposes, including the application of skills and ideas within other subjects.
- The ability to connect with others safely and respectfully, understanding the need to act within the law and with moral and ethical integrity.
- An understanding of the connected nature of devices.
- The ability to communicate ideas well by using applications and devices throughout the curriculum.
- The ability to collect, store, retrieve, manipulate and present data effectively.

In each of the following sections, an overview of the content and key terminology used is given. Teaching activities are suggested that may be useful for year groups' planning. The topics are given in a suggested chronological order though it is expected that teaching activities from each to be picked out and used where they best fit long- and medium-term plans. As we extensively use the Purple Mash online learning platform, units from the Purple Mash Computing Scheme of Work are suggested where they will be most useful.

Contents

# Year One

## Understanding IT and using modern networks

Children learn about the devices that we have at school and compare them to the devices they use at home. They begin to understand that most modern devices can be connected via the internet to a vast online world of digital content. They begin to explore our range of online learning resources by learning to log in with their personal ID.

**Terminology**

The Internet, device, connection, digital, login, username, password, avatar, folder, file

**Teaching Activities**

- Go on a 'device hunt' in the classroom, around school and at home.
  *How many did you find? What do they look like? What parts do they have? Are they connected?*
- *Purple Mash Unit 1.1*

**Key Knowledge and Skills**

- Different devices can be connected to a network or the Internet
- We can log in to our school services
- How to turn on a school laptop

## Keeping Safe

As children begin to use school devices and identities to log in to online resources, they begin to learn how their personal ID can keep them safe and that it should be kept private.

**Terminology**

login, username, password, avatar, magic badge (QR Code)

**Teaching Activities**

- *Purple Mash Unit 1.1*

**Key Knowledge and Skills**

- My personal ID helps keep me safe online
- I must not share it with anyone else

## Creating Digital Content

**Content**

Children begin to create pictures using digital tools.

**Terminology**

picture, image, graphic, avatar, file, folder

**Teaching Activities**

- Create a save a digital image using a paint tool
- *Purple Mash Unit 1.1*
- *Purple Mash Unit 1.6*

**Resources**

- Purple Mash 2Paint

**Key Knowledge and Skills**

- Names of input devices: trackpad, touchscreen, mouse, keyboard
- How to use a trackpad effectively

## Thinking Computationally

Pupils should begin to understand that, when we use digital devices, the devices follow special instructions. They should also begin to understand that these instructions have been written down (coded) by people for that device. Instructions for a device are called programs. Pupils will create and fix (debug) their own simple programs.

### Terminology

device, instruction, program, debug

### Teaching Activities

- Decide the instructions for a simple task.
  *Is there enough information? Would an alien understand what to do?*
  *Purple Mash Unit 1.4 – Lego Builders*
- Program a bee-bot to move and predict where it will stop.
  *Can you speak bee-bot?*
- Program on-screen objects to move.
  *Purple Mash Unit 1.5 Maze Explorers*
  *Purple Mash Unit 1.7 Coding*

### Key Knowledge and Skills

- Programmable devices can only follow the instructions we give them.

# Year Two

## Understanding IT, using modern networks and keeping safe

Children continue to learn how our devices are connected by the Internet to each other and to services provided from anywhere across the world. They remind themselves of their school learning ID and how to log in to our services. Children learn and apply our school E-Safety rules and begin to learn how to communicate in a simplified and safe online space (e.g. Purple Mash).

**Terminology**

login, username, password, account, avatar, email, message, digital footprint

**Teaching Activities**

- Purple Mash Unit 2.2 Online Safety

**Key Knowledge and Skills**

- Your **digital footprint** is the trail you leave online

## Creating Digital Content

Children learn to create a variety of text, pictures, music, graphs and charts using our online resources.

**Terminology**

picture, image, graphic, avatar, file, folder, toolbar, icon

**Suggested Teaching Activities**

- Use Purple Mash 2Design-and-Make to create an ice cream van design linking to Y2 DT
- Use Purple Mash 2Graph to make bar charts to show the results of a survey (e.g., garden birds)
- Purple Mash Units 2.6, 2.7 and 2.8
- Using digital media to support and enhance work in other curriculum subjects and topics

**Key Knowledge and Skills**

- Tool selection in Purple Mash
- Common features of tools: hamburger menu, save, undo, redo
- Specific features of creating tools: e.g., flood fill tool when drawing/painting

## Thinking Computationally

Pupils understand that, when we use digital devices, the devices follow clear and unambiguous instructions, called programs, that were coded for and installed on the device. Pupils continue to create and debug their own programs, adding sophistication by responding to events and taking different actions depending on conditions.

**Terminology**

device, instruction, program, coding, debugging, event, condition

**Teaching Activities**

- Define clear and unambiguous instructions for an everyday task.
  *What happens if we follow these instructions literally and to the letter?*
- Program a bee-bot to move to a destination avoiding an obstacle.
  *How would your program change if I move the obstacle?*
- Program on-screen objects to move and respond using repetition and timers
  *Purple Mash Unit 2.1 Coding*

**Key Knowledge and Skills**

- The design, code, test, repeat… cycle
- Programs run from top to bottom unless waiting for an event

# Year Three

## Keeping Safe

Children learn how to choose safer passwords and may improve the password they use for the online school ID. They will learn the benefit of a secure password and the dangers of sharing passwords with others. Children should begin to learn how to evaluate online content and the skill of being a sceptical consumer. They learn the meaning and purpose of age restrictions on digital media and services and where to turn for help if they see upsetting content or receive hurtful or inappropriate contact from others.

**Terminology**

secure, cyberbullying, keyboard, SHIFT, CAPS-LOCK

**Suggested Teaching Activities**

- Purple Mash Unit 3.2 Online Safety

**Key Knowledge and Skills**

- How to report online issues
- Passwords should be chosen to be hard to guess (use SHIFT for caps and symbols) and hard to crack

## Thinking Computationally

Children design, write and debug programs and create simulations of physical systems. They solve problems by decomposing them into smaller parts and use sequencing, selection, and repeat constructs in coding. They develop their logical reasoning to explain how simple algorithms work and to detect and correct errors in algorithms and programs.

**Terminology**

program, design, code, test, debug, block, condition, simulation, model

**Teaching Activities**

- Purple Mash Unit 3.1 Coding

**Key Knowledge and Skills**

- Programs are created using the **design, code, test/debug, repeat** cycle
- Programs are built from blocks that do different jobs

## Creating Digital Content

Children will continue to prepare digital content versions of selected work in other subjects, saving and retrieving their own work independently. Begin to use advanced features of apps and programs (can be accomplished from one or more of the suggested Purple Mash units).

**Terminology**

spreadsheet, row, column, cell, database, data, query (question)

**Teaching Activities**

- Purple Mash Unit 3.3 Spreadsheets
- Purple Mash Unit 3.6 Branching Databases

**Key Knowledge and Skills**

- Two common computing tools are **spreadsheets** and **databases**.
- A **database** helps us organise information so that it can be searched easily and quickly.
- A **spreadsheet** helps us to do calculations.

## Understanding IT and using modern networks

Children learn how IT can be used to create simulations that represent a real or imaginary situation. They learn how these can be useful for making predictions and for entertainment. They expand their knowledge and understanding of online messaging using a simulated email system.

## Terminology

simulation, system, model, input, output, prediction, accuracy, email, message, attachment, virus, trojan

## Teaching Activities

- Purple Mash Unit 3.5 Email
- Purple Mash Unit 3.7 Simulations

## Key Knowledge and Skills

- Make good decisions about digital messages received based on sender, title and content
- Compose and send appropriate messages, including replies to received messages
- Use, evaluate and create simulations

# Year Four

## Understanding IT and using modern networks

**Content**

Children will learn about the important components that comprise a (reasonably) modern computer. They compare the design and features of commonly used devices, e.g.: PC, laptop and tablet.

**Terminology**

CPU, mouse, monitor, motherboard, trackpad, etc.

**Teaching Activities**

- Purple Mash Unit 4.8 Hardware Investigators
- Dismantle and examine old equipment
- *Experimental: setup and use a simple network offering a service.*

**Key Knowledge and Skills**

- Terminology (above)

## Keeping Safe

**Content**

Children continue to develop their awareness of the benefits and potential pitfalls of using internet connected devices. They understand the term digital footprint and are aware of what it might contain. They are aware of the practice of phishing and the existence of scam websites. They improve their ability to search for and find information that they need in a form that is suitable for their age group. They are aware of how copyright affects their right to use what they find in their own work.

**Terminology**

digital footprint, phish, scam, malware, search criteria, copyright, attribution

**Teaching Activities**

- Purple Mash Unit 4.2 Online Safety
- Purple Mash Unit 4.7 Effective Search

**Key Knowledge and Skills**

- Safe searching skills
- How to add found images to Purple Mash content

## Thinking Computationally

**Content**

Children will continue to improve their understanding of the coding process through the plan, build, test and improve cycle. They use IF/ELSE statements, repeat statements and variables with increasing confidence.

**Terminology**

variable, statement, model, abstract, decompose

**Teaching Activities**

- Purple Mash Unit 4.1 2Code
- Purple Mash Unit 4.5 Logo

**Key Knowledge and Skills**

- Purple Mash screen designs can include numbers and text, simple objects with display properties
- A variable is a similar, but even simpler, object that programs can use when screen display is not needed
- Variables are created with a given type (number, text)
- How to create and use variables in 2Code

# Creating Digital Content

**Content**

Children learn how an image is stored in digital form and explore the tools and features of a real-world image processing app. They understand how an image can be manipulated to show a convincing picture of something that has never happened and may create their own fantasy image. They learn and experience the process of creating animations.

**Terminology**

image, graphic, file, binary, pixel, tool, toolbar, transformation, animation, frame, frame-rate

**Teaching Activities**

- Digital Image Processing
- Purple Mash Unit 4.5 Animation

**Key Knowledge and Skills**

- Digital images are represented by numbers defining pixels
- Digital images can be combined and altered to create art or other imaginary scenes
- Moving images can be made by quickly changing the static image on a screen
- Specific skills to use an animation tool (e.g., 2Animate)

# Year Five

## Understanding IT and using modern networks

Children improve their knowledge of the keyboard and its history, their typing skills and can use SHIFT as well as CAPS-LOCK. They explore the rise of voice-activated control and discuss the pros and cons of each. They revisit and revise their knowledge of the components present in a device (PC, laptop, tablet, phone).

**Terminology**

keyboard, lower-case, upper-case, SHIFT, CAPS-LOCK, microphone, speaker

**Teaching Activities**

- Purple Mash Unit 3.4 Touch Typing with extensions (this is good for short sessions around swimming)
- *Experimental: try out voice activated devices in a classroom situation*

**Key Knowledge and Skills**

- Why QWERTY?
- Touch typing

## Keeping Safe

Children can explain the SMART rules for guidance when online and know who to tell and how to report anything upsetting that might happen. They think critically about what information, about themselves *and* others, they choose to share online. They continue to improve their search and research skills and their knowledge of copyright laws.

**Terminology**

reputable, reliable, citation, reference, bibliography, identity theft

**Teaching Activities**

- Purple Mash Unit 5.2 Online Safety

**Key Knowledge and Skills**

- SMART rules, copyright laws
- Safe searching skills

## Creating Digital Content

**Content**

Children continue to create digital content that supports their learning across the wider curriculum. This takes the form of documents, pictures, graphs and charts, presentations, audio and video.

**Terminology**

Video: director, script, shot, soundtrack, editing, etc.
3D Modelling: CAD, 2D, 3D, 3D printing, origin, axes, viewpoint, template

**Teaching Activities**

- Make a movie linked to a text studied in literacy lessons
- Create and explore 3D models (suggestions: *Purple Mash Unit 5.6, Sketchup or TinkerCAD*)

**Key Knowledge and Skills**

- Generic vs. specific features of tools used (generic: load/save/select, specific; rotate/translate)

# Thinking Computationally

**Content**

Children continue to develop their coding skills, improving programs that use variables, loops and timers. They explain how their programs simulate physical systems and how they have selected specific elements from those systems to incorporate into their programs. They understand that a wide variety of coding languages and coding platforms exist and are continually being developed.

**Terminology**

action, alert, algorithm, bug, design, command, control, event, input, output, condition,

**Teaching Activities**

- Coding in 2Code, 2Logo or similar according to level appropriate for year group

**Key Knowledge and Skills**

- Able to use loops and timers, able to use variables (with support)

# Year Six

## Understanding IT and using modern networks

**Content**

Children deepen their understanding of the way a device connects, via different protocols (physical, electronic and software), to the Internet. They gain an insight into how online services are provided and the many interdependent systems on which they rely. They learn some history of the World Wide Web and about its original development by Tim Berners-Lee and his collaborators.

**Terminology**

network, protocol, WiFi, Ethernet, LAN, WAN, Internet, WWW, packet, connection, cable, switch, router

**Teaching Activities**

- Follow the packets – Networks, Online Services and Data Centres
- Purple Mash Unit 6.6 Networks

**Key Knowledge and Skills**

- Knowledge of key terminology

## Keeping Safe

**Content**

Children reflect on the positive and negative influences of technology on their health, well-being and the environment. They review the meaning of a digital footprint and further develop their understanding and practise of appropriate online behaviour. They review and improve their knowledge of age guidelines and rating systems that allow them and their parents/guardians to choose age appropriate games and media.

**Terminology**

PEGI rating, screen time, digital footprint

**Teaching Activities**

- Purple Mash Unit 6.2 Online Safety
- Existing Y6 Planning for Online Safety

**Key Knowledge and Skills**

- How devices/apps can be configured to give or withhold personal information, including location
- How to evaluate links before clicking and to evaluate websites/content when reading/viewing
- SMART rules

## Creating Digital Content

**Content**

Children build confidence to independently select and use appropriate apps and formats when creating digital content. They support, present and publish their learning in other curriculum subjects. A variety of suitable subjects and topics can be selected to enhance and extend elements of the wider curriculum with reference to the medium-term planning for the year group.

**Terminology**

blog, vlog, page, post, collaboration, publication

**Teaching Activities**

- Purple Mash Unit 6.7 Quizzing (can support skills weeks in Autumn term)
- Purple Mash Unit 6.4 Blogging (limited time to support a topic)
- Create East Barnby / Whitby Trip souvenir page

**Key Knowledge and Skills**

- Document layout and simple graphic design principles

## Thinking Computationally

**Content**

Children use a program design process to develop and implement algorithms for more complex programs. They code test and debug using their designs. They use advanced features of the file system or coding environment to organise their code for ease of understanding.

**Terminology**

Revise primary computational vocabulary from previous years, portable

**Teaching Activities**

- Code using a text-based language (suggestions: *HTML+javascript, 2Logo, FMSLogo, Sonic-Pi*)

**Key Knowledge and Skills**

- How to translate from a block-based coding system, like 2Code, into text
- That text-based code can be highly **portable** across devices