Unit 1 Online Safety: Journey of Knowledge

Context and Introduction to unit:
Overview statement of the unit.
In this unit pupils will learn about how to log in to the school network and how to use ICT facilities safely both online and physically. Pupils will learn about some key online safety concepts.
Overview statement of the unit.
Prior Knowledge KS2
- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

Career links.
Cybersecurity Analyst / Network pen testing / IT Technician
RSE:
Staying safe online. Relationships – how to collaborate.

CORE KNOWLEDGE

1. A username is unique and identifies you to the central server.
2. Passwords should not be shared.
3. Passwords should not contain obvious information that could be guessed.
4. Passwords should contain, upper and lower-case letters and at least one number.
5. Passwords should never be shared.
6. A server is the main computer that controls a network.
7. The server logs all your activity when using computers.
8. Hillside uses a network allows users to share resources and software.
9. Networks allow users to save files and documents on a central computer which can be accessed from anywhere.
10. Office 365 uses cloud computing which means no programs are downloaded on the device. All programs and apps are accessed through the web.
11. An email is a formal method of communication.
12. An email comprises of a subject line, introduction, main message and sign off.
13. Collaboration online should be positive.
14. Cyberbullying is bullying that happens online.
15. There are different types of cyberbullying including flaming, exclusion, harassment, Denigration, Outing, impersonation and cyber stalking.
16. Harassment - Sending offensive, rude, and insulting messages and being abusive.
17. Denigration – Sending information about another person that is fake, damaging and untrue.
18. Flaming – When someone is purposely using really extreme and offensive language and getting into online arguments and fights.
19. Impersonation – Using someone else's social media / email account to post or send embarrassing material.
20. Outing and Trickery – Sharing someone else's personal information.
21. Cyber Stalking –Repeatedly sending messages that include threats of harm, harassment, intimidating messages. Illegal.
22. Exclusion –Leaving someone out of a group
23. Liking / sharing posts can be examples of cyberbullying.
24. Social media have minimum ages.
25. Microsoft Word is word editing software used for formal documents including letters.
26. Microsoft PowerPoint is presentation software.

ABOVE AND BEYOND

Benefits and disadvantages of cloud computing.

Microsoft Sway
Advanced PowerPoint . Word techniques

VOCABULARY

Network
Server
Cyberbullying
Harassment
Stalking
Outing
Denigration
Flaming
Impersonation
Communication
Consistency

WHERE NEXT?

Unit 2 – Computer systems
Pupils will build upon their knowledge of online safety by learning how data is processed by computers and how data is transmitted over networks.

KS3 NC links

understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct, and know how to report concerns

Unit 2 Computer Systems: Journey of Knowledge

Context and Introduction to Unit
Overview statement of the unit.
In this unit pupils will learn about what a computer system is including the key input and output devices that are used within a computer system. They will examine the difference between hardware and software. Pupils will learn about different data types and the relationship between data and information. They will learn about the different number systems and how to convert binary into denary and vice versa.

Prior knowledge (KS2)

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

Career links.
Data analysis
IT Technician
Software / App developer
RSE:
Staying safe online. Knowing the risks.

CORE KNOWLEDGE	ABOVE AND BEYOND	WHERE NEXT?
1. A range of digital devices can be considered a computer.		**Unit 3 Data Representation and computational Thinking**
2. A computer system will take an input, process it and produce an output.	8 Bit binary	
3. An embedded system can perform only one task.	Boolean data type	
4. A general purpose system can perform multiple tasks.	Integer / float	**Pupils will build upon their knowledge of networks and computer components by learning how data is represented in computer systems and the stages of computational thinking**
5. Hardware and application software are different. Hardware is the physical parts of the computer we can interact with and software is how we interact with a computer.		
6. Multiple types of hardware must be used to effectively used software.	**VOCABULARY**	
7. Hardware consists of input and output devices.		.
8. Input devices are mouse, keyboard, scanner, digital camera, game controller, etc.	Hardware	
9. Output devices are printer, monitor, headphone, etc.	Software	
10. Some hardware can be both input and output e.g games controller and iPad.	Physical	
11. Computers collect data from devices including sensors (light, temperature, accelerometer)	Software	
12. Sensors are an automatic input device	Boolean	**KS3 NC Links**
13. Actuator is used for automated data outputs	Information	
14. The CPU is the brain of the computer	Digital	
15. CPU stands for Central Processing System	Application	understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems
16. Hard Drive is the computers long term memory	Input	
17. RAM is the computers short term memory	Output	
18. Different units of data are used to measure hardware in a computer.	Process	
19. CPU speed is measured in Ghz.		
20. Storage is measured in Bytes.		understand how instructions are stored and executed within a computer system;
21. b = bit, B=Byte, KB = Kilobyte, MB=Megabyte and GB=Gigabyte		
22. The correct order of storage is Bit>Bye>KB>MB>GB		

Unit 3 Representing Data and Computational Thinking : Journey of Knowledge

Context and Introduction to Unit: Year 7

Overview statement of the unit. In this unit pupils will learn about the three stages of computational thinking based on real world problems. Pupils will also learn how to write algorithms using the three basic programming constructs.

Prior knowledge (KS2)

- 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

Career link:
Programmer / developer
Games developer.
Web developer

CORE KNOWLEDGE

1. Data and information are different. Data is what is input into a computer and information is what is output after the data has been processed.
2. All information that is processed by a computer is in the form of a sequence of 1s and 0s.
3. Computers use electrical signals that are on or off, so they have to see everything as a series of binary numbers. This data is represented as a sequence of 1s and 0s (on and off).
4. All data that we want a computer to process needs to be converted into this binary format. This includes numbers, text, sound and images.
5. People use the denary (or decimal) number system in their day-to-day lives. This system has 10 digits that we can use: 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9.
6. Binary is a number system that only uses two digits: 1 and 0.
7. In denary, the place values are 1, 10, 100, 1000, etc – each place value is 10 times bigger than the last.
8. In binary, the place values are 1, 2, 4, 8, etc – each value is two times bigger than the last.
9. You should know how to convert 8-bit binary numbers to denary and vice versa.
10. Computational thinking allows us to take a complex problem, understand what the problem is and develop possible solutions by thinking like a computer
11. Algorithms - a set of step-by-step instructions to describe a task or process
12. Decomposition - breaking down a complex problem or system into smaller, more manageable parts
13. Pattern recognition – looking for similarities among and within problems
14. Abstraction – focusing on the important information only, ignoring irrelevant detail
15. Flow charts contain terminators symbol, process symbol and decision symbol.
16. The terminator (start/end) is rounded rectangle.
17. A process is a rectangle.
18. A decision is a diamond.
19. Iteration is where a piece of code is looped a specific number of times or until a condition is met.

ABOVE AND BEYOND

Count / Condition controlled loops
Variables and constants

VOCABULARY

Abstraction
Decomposition
Sequencing
Selection
Decision
Iteration
Loop
Repeat
Variable

WOW zone tasks

Explain suitable input / output devices for a given scenario with justifications.

KS3 NC Links

- design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems
- understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem

Unit 4 Programming: Journey of Knowledge

Context and Introduction to Unit:
This unit is the first programming unit of KS3. The aim of this unit and the following unit ('programming 2') is to build learners' confidence and knowledge of the key programming constructs. Importantly, this unit does not assume any previous programming experience, but it does offer learners the opportunity to expand on their knowledge throughout the unit. The main programming concepts covered in this unit are sequencing, variables, selection, and count-controlled iteration.

Prior knowledge (KS2)
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

Career links:
Programmer / Web based Games Designer
RSE:
Staying safe online

CORE KNOWLEDGE

1. Code – Algorithm carried out by the computer
2. Python is a high level, text based programming language.
3. High level languages are converted into binary
4. Sequencing is carrying out instructions in the specified order.
5. A syntax error is where the rules of the language have not been followed.
6. Selection is when a program makes a decision.
7. A variable is a named store of data
8. A variable can be assigned by the programmer or assigned through user input
9. Data can be saved as different types
10. A string is characters and non mathematical numbers
11. An integer is a whole positive number
12. Selection is where a decision is made in a program based on a set of criteria

Core Programming Knowledge

Data types
Assigning variables
Outputting to screen
Inputs
Numerical operations
Selection statements – If

In addition to text based programming you will also use block based programming

ABOVE AND BEYOND

Use of while loops
Use of lists
Integration with hardware - microbats.

VOCABULARY

Algorithm
Python
Syntax
Input
Print
Variable
Assign
Integer
String

WHERE NEXT?

Year 8 – Online Safety

KS3 NC Links

Use 2 or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays];
design and develop modular programs that use procedures or functions understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming;