

Subject Computing

Year 7 Curriculum

ASPIRE – ENDEAVOUR - SUCCEED

Purpose and aims

Computing at David Nieper Academy aims to both equip students with the skills they will need to confidently use computers as they will do in the world of work, but also to provide a robust foundation to students who wish to continue with their studies in computer science through GCSE and beyond. As well as developing skills in computing, we also recognise that computing offers a fantastic opportunity to practice and apply core skills (particularly numeracy) to new situations. The course is designed with these numeracy links in mind and provides opportunities to practice numeracy wherever possible.

Our curriculum for computing aims to ensure that all pupils:

- can understand and apply the fundamental principles and concepts of computing including abstraction, logic, algorithms and data representation
- have a solid understanding of the function of the key components inside of a computer
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- are responsible, competent, confident and creative users of information and communication technology

In year 7

Year 7 is structured to give students basic digital literacy skills as well as to introduce topics that will be further expanded Years 8 and 9. Digital literacy skills are included as they are necessary for students to complete work in other subjects and to ensure students are responsible, competent, confident and creative users of information and communication technology. They are also key employability skills as careers increasingly utilise ICT and systems.

Threshold concepts

Core knowledge – be able to recall the major pieces of knowledge throughout the year. E.g. what is the definition of malware, what is a hard drive.

Critical reasoning – be able to explain the pros and cons of a system/approach/component and decide if it is the best option in a given situation. E.g. be able to answer “which would be better for a given computer to use an SSD or a Hard drive? Explain why”

Applied Mathematics – be able to answer questions that require maths to be applied to the core knowledge. Students should be able to decide on what calculations need to be done and carry them out. E.g. be able to work out how long it would take to download a 200Mb file over a 30Mb connection

Design – be able to apply the core knowledge to design a program in scratch to solve a problem

Sequence of learning

At KS3 the sequence of learning is a sequence that stretches year 7,8, and 9, rather than being easily split into 3 separate schemes. For an overarching view the KS3 curriculum map will give a better picture.

Year 7 Units (in Order)

Digital Literacy – Digital Literacy is designed to make sure all students are competent in the use of computers to do work. This unit will cover File explorer, and email, as well as use of MS Word and MS PowerPoint. This unit is a prerequisite to any work that they will be doing on the computers in other subjects as well as in computer science.

Cyber Security – This unit teaches students about the different types of malware and hacking that are used as well as some explanation of how passwords work and what makes them secure. The unit aims to blend a good theoretical knowledge with some practical advice on how to stay safe and keep data secure online.

Hardware and Software – Hardware and Software introduces the building blocks of a computer. The unit briefly covers system software and application software in the software side. For hardware the unit covers input and output devices, secondary storage, main memory and the CPU. This unit is built upon in the year 8 computer architecture unit with the CPU in detail and the fetch decode execute cycle.

The Digital Divide – The digital divide unit discusses how access to technology can vary depending on social, financial, and geographic factors. As part of this students cover what bandwidth is and how to calculate download times with the size of files and bandwidths. This knowledge is built on in the year 8 binary unit and the year 9 networks unit.

Scratch – This unit offers a great introduction of programming that will be built on in the python units in year 8 and 9. Scratch is a block-based coding language which allows students to learn the key concepts of sequence, selection, and iteration without worrying about syntax errors.

Subject knowledge

Topic 1 – Digital Literacy	
Subject knowledge Students should know....	Procedural Knowledge Students should know how to....
What File Explorer is. And that everything stored on a computer can be accessed through file explorer	How to navigate file explorer, create folders, and save an open files that we create
That outlook is an email client and is used in the school. That emails are messages that are sent across the internet	How to use outlook to send and reply to email. Students should know how to use an appropriate subject line and attach document (from file explorer) to the email.
That Microsoft word is a text editor and can be used to create text documents with pictures and in a range of styles	Format text in order to change its size, style, underlined and where it is aligned on the page.
Ctrl+c Ctrl+v Ctrl+z Ctrl+y	Copy and paste text using the keyboard shortcuts and images using the menus. Use the undo shortcut to undo mistakes

That PowerPoint is a program used to make slide show presentations	Create multiple slides and use animations where appropriate
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Topic 2 – Cyber Security

Subject knowledge Students should know....	Procedural Knowledge Students should know how to....
Common types of malware -virus -Adware -Spyware -Ransomware -worm -trojan	Avoid malware
What hacking is and the types of hacker Black hat / white hat / grey hat	Avoid or limit damage from hackers
Common social engineering attacks	Avoid social engineering attacks
What a password is and what encryption is What makes a secure password and why	Design a secure password

Topic 3 – Hardware and Software

Subject knowledge Students should know....	Procedural Knowledge Students should know how to....
What is meant by a peripheral and an input / output device	Identify if a peripheral is an input or an output device
That all information in a computer is stored as 1's and 0's and must be stored physically	
What is meant secondary storage and the 3 main types magnetic / optical / solid state	Evaluate the pros and cons of each type of storage
The job of the CPU and RAM	
The job of the motherboard	
What is meant by System software and application software	

Topic 4 – The Digital Divide

Subject knowledge Students should know....	Procedural Knowledge Students should know how to....
What is meant by the term digital divide	
What Financial, geographic, and social barriers exist that widen the digital divide	Identify whether a digital divide is caused by a geographic, social, or financial gap
How internet speed can have a major factor in the digital divide	How to calculate how long it takes to download a file with different internet speeds
What is meant by bits, bytes, kilo, mega, and giga bytes	Convert between the different units
What is meant by digital literacy That many programs cost money but have free alternatives	

What the main specifications of a computer are and how they effect the performance and cost of the computer	
The advantages and disadvantages of a PC vs a tablet or smartphone	

Topic 5 & 6 – Scratch

Subject knowledge Students should know....	Procedural Knowledge Students should know how to....
That computers can only follow precise sequences of instructions as entered by a programmer.	How to put instructions in the correct order.
That all programs execute code in the order it is entered.	How to assign the correct data type to a variable.
That a variable is a way of storing a piece of data so a program can use it.	Write basic expressions to test data.
How expressions can be used to evaluate data. Expressions are either true or false.	Write simple count-controlled loops to
How loops can be used to test data to see if meets certain criteria.	Write simple condition-controlled loops
The difference between count-controlled and condition-controlled loops.	

Curriculum links to careers

Within the topic on the Digital Divide we look at careers and the impact of the digital divide on jobs and what this might mean to people who don't have the right skills and their employment prospects. This unit reinforces the need for IT skills in almost all forms of employment from farming through to the work of a computer programmer.