

Assessment in Computing

| Assessment | Essential Component Knowledge | Why is this essential knowledge? | Misconceptions Often Addressed | What are the essential skills? | Why is this an essential skill? |
|--|---|--|--|---|---------------------------------|
| Introductory Unit Smart rule and Logo | SMART Rules | Underpins ideas behind staying safe online and how to deal with unsafe situations | | | |
| | Key programming terms <i>sequence, iteration, function</i> | Terms used throughout KS3 and KS4 and understanding them is essential to a programmer | What is a program and what is an algorithm | Writing programs, finding and fixing errors, making programs more efficient | Used throughout KS3 and KS4 |
| Networks Unit | The need for networks and communication. The role of specific network hardware The idea of a protocol | Networks are ubiquitous and are necessary for many things we take for granted. Network hardware and protocols are a key component at GCSE | The difference between the internet and the www. | | |
| Using Media | Apply referencing techniques and understand the concept of plagiarism Not all sources are equal. | Being able to find and evaluate sources is necessary so that only accurate information is gleaned. | All images on the internet can be copied without problem | Apply referencing techniques that credit authors appropriately | Lifelong skill |
| Scratch | Key programming terms | Terms used throughout KS3 and KS4 and | What is a program and what is an algorithm | Writing programs, finding and fixing | Used throughout KS3 and KS4 |

Summative Assessment in Computing and Computer Science

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|--|--|---|--|--|--|
| | <i>sequence, iteration, selection, variable, clone</i> | understanding them is essential to a programmer | | errors, making programs more efficient | |
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What happens following an assessment to address pupil misconceptions and reteaching of essential knowledge?

- The teacher will go through the assessment in dedicated time. Model answers are given.
- Pupils will green pen some or all of their errors.
Where a pupil has a small number of errors the expectation is that all are corrected. If a pupil has a large number of gaps, then some are corrected.

Formative Assessments

- Cold questioning throughout the topic to check knowledge is secured and that suitable examples can be recalled.
- Whiteboards to check keywords and knowledge
- Each lesson starts with short retrieval exercises of previous work.
- Low stakes or no stakes quizzes
- While working on computer (for example when programming) the teacher is expected to be walking around looking at work and correcting misconceptions and guiding pupils towards a correct solution.

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Year 8

| Assessment | Essential Component Knowledge | Why is this essential knowledge? | Misconceptions Often Addressed | What are the essential skills? | Why is this an essential skill? |
|------------------|---|---|--------------------------------|--------------------------------|---------------------------------|
| Computer Systems | <p>What is an embedded system?</p> <p>Computer architecture</p> <p>How the hardware components used in computing systems work together in order to execute programs</p> <p>Units of data</p> <p>Binary numbers</p> <p>Character Codes</p> | <p>Direct link to GCSE content</p> | | | |
| Spreadsheets | <p>Analysis of data</p> | <p>Links to data science and big data – key concepts in computer science</p> | | | |
| | <p>Use of arithmetic and functions</p> | <p>Direct link to using expressions and functions in programming in Y8, Y9 and GCSE</p> | <p>Order of operations</p> | | |

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|--------------------|--|---|--|---|--|
| Vector graphics | The language of graphics | Link to Bitmap topics at GCSE | | Use vector tools to create graphics | Modern standard way of creating graphics used in many industries |
| Python Programming | Key programming terms & concepts <i>sequence, iteration, selection, variable, function, translator, , data types, casting</i> | Terms used throughout KS3 and KS4 and understanding them is essential to a programmer | What is a program and what is an algorithm | Writing programs, finding and fixing errors, making programs more efficient | Used throughout KS3 and KS4 |

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Formative Assessments

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- Whiteboards to check keywords and knowledge
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Summative Assessment in Computing and Computer Science

Year 9

| Assessment | Essential Component Knowledge | Why is this essential knowledge? | Misconceptions Often Addressed | What are the essential skills? | Why is this an essential skill? |
|--------------------|--|---|--------------------------------|--|--|
| Cyber security | Threats to data and systems Effective methods to prevent cyberattacks Relevant legislation | Direct link to GCSE content | | | |
| Python programming | Key programming terms & concepts <i>sequence, iteration, variable, function, user-defined functions, parameters</i> | Terms used throughout KS3 and KS4 and understanding them is essential to a programmer | | Problem solving Writing programs, finding and fixing errors, making programs more efficient | Problem solving is at the heart of computer science. All skills uses throughout GCSE. |

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Where a pupil has a small number of errors the expectation is that all are corrected. If a pupil has a large number of gaps, then some are corrected.

Formative Assessments

- Cold questioning throughout the topic to check knowledge is secured and that suitable examples can be recalled.
- Whiteboards to check keywords and knowledge

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- Each lesson starts with short retrieval exercises of previous work.
- Low stakes or no stakes quizzes
- While working on computer (for example when programming) the teacher is expected to be walking around looking at work and correcting misconceptions and guiding pupils towards a correct solution.

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Year 10 & 11

| Assessment | Essential Component Knowledge | Why is this essential knowledge? | Misconceptions Often Addressed | What are the essential skills? | Why is this an essential skill? |
|--------------------------------------|--|----------------------------------|--|--|--|
| Systems Architecture | The purpose of the CPU and its architecture CPU Components and their functions Von Neumann Architecture | GCSE Content | The difference between storing data and an address | Understanding command words in questions | Needed to interpret questions and answer appropriately |
| CPU Performance and embedded systems | How common characteristics of CPUs affect their performance The purpose and characteristics of embedded systems | GCSE Content | What the speed of a processor actually means How to use the word "faster" in an answer What embedded systems are | | |
| Primary Storage | The need for and purpose of primary storage Types of primary storage | GCSE Content | | | |
| Secondary Storage | The need for secondary storage | GCSE Content | Why secondary storage is needed as long-term, non-volatile storage | How to answer comparison questions | Needed for many types of question |

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| | Common types of storage Comparing types according to key characteristics | | rather than because primary storage is full. | | |
| Programming Fundamentals | Key concepts: - Algorithm, program, output, input, sequence, selection, iteration, casting, data types | GCSE Content | Difference between assignment (=) and comparison (==) Why we need to use casting to change data types | Problem solving, writing programs, finding and fixing errors, making programs more efficient | Necessary to program successfully. |
| Networks and protocols | Types of network and network roles Topology Hardware needed for networks The internet | GCSE Content | Difference between the WWW and the internet | | |
| Wired and Wireless networks | Modes of connection Network addressing Layers, standards and protocols The need for encryption | GCSE Content | The difference between a standard and a protocol | | |
| Threats to networks and systems and prevention | Forms of attack including the purpose and mechanism used Common preventative measures | GCSE Content | What each prevention method may limit or prevent What a firewall actually does | | |

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| Additional Programming techniques | The use of arrays (Python Lists) as a data structure. Using sub-programs (functions and procedures) to produce structured code Using random number generators | GCSE Content | Difference between a function and a procedure | Problem solving, writing programs, finding and fixing errors, making programs more efficient | Necessary to program successfully. |
| Operating systems | The purpose and functionality of operating systems The purpose and functionality of utility software | GCSE Content | | | |
| Computational Thinking | Principles of computational thinking: Abstraction, Decomposition, Algorithmic thinking | GCSE Content | | Using principles to define and refine problems | GCSE Content |
| Algorithms | Designing, creating and refining algorithms using pseudocode, flowcharts, OCR reference language | GCSE Content | | Problem solving using the principles of computational thinking | GCSE Content |
| | Searching and Sorting algorithms | GCSE Content | | | |

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| Ethical, legal, cultural and environmental impact | Impacts of digital technology on wider society including: Ethical issues, Legal issues, Cultural issues, Environmental issues, Privacy issues Legislation relevant to Computer Science | GCSE Content | | | |
| Additional Programming techniques | Basic string manipulation Handling text files Using (database) records to store data Using SQL to query search for data | GCSE Content | | Problem solving, writing programs to handle files, finding and fixing errors Writing SQL queries | |
| Testing | The purpose of testing Types of testing Refining algorithms based on test results | GCSE Content | | Creating normal, boundary and erroneous test data | GCSE Content |
| Boolean Logic | Simple logic diagrams using the operators AND, OR and NOT Truth tables Combining Boolean operators using AND, OR and NOT Applying logical operators in truth | GCSE Content | | | |

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| | tables to solve problems | | | | |
| Languages | Characteristics and purpose of different levels of programming language The purpose of translators The characteristics of a compiler and an interpreter | GCSE Content | | | |
| IDEs | Common tools and facilities available in an Integrated Development Environment | GCSE Content | | | |

What happens following an assessment to address pupil misconceptions and reteaching of essential knowledge?

- The teacher will go through the assessment in dedicated time. Model answers are given.
- Pupils will green pen all of their errors.
- In some cases, additional questions will be set in order to cement understanding

Formative Assessments

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- Cold questioning throughout the topic to check knowledge is secured and that suitable examples can be recalled.
- Whiteboards to check keywords and knowledge
- Use of Seneca and Quizlet for retrieval activities
- Each lesson starts with short retrieval exercises of previous work.
- Low stakes or no stakes quizzes
- While working on computer (for example when programming) the teacher is expected to be walking around looking at work and correcting misconceptions and guiding pupils towards a correct solution.