



Digital literacy in the Key Stage 3 Computing curriculum in England

Three statements in the Computing curriculum address digital literacy at Key Stage 3.

These are that pupils should be taught to:

- undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users
- create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability
- 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.

To help teachers plan for teaching Digital Literacy in their Key Stage 3 Computing Curriculum. The following table identifies the specific essential subject knowledge contained within these three statements. Examples are provided of how this subject knowledge could be taught.

Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users.

‘selecting, using and combining multiple applications’

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| <ul style="list-style-type: none">• Selecting applications based on the data to be processed, the process to be applied and the required format needed for the final digital product.• Different file types, when they are used, the digital processes that can be applied to them and the software tools to use.• How to select a range of applications that can be used in combination to complete a given task.• How information flows between using multiple applications and how they can process data and provide output into the following application.• Embedding the output data from one application in a digital product created in another application. | <ul style="list-style-type: none">• Example applications include productivity, creativity, communications and collaboration tools.• Developing a webpage or website that includes media content such as images. Using image editing software to manipulate different images types and changing file formats to reduce load times (PNG etc.).• Using databases and spreadsheets to process data and provide the necessary output for the given audience or system.• Converting the outputs of a piece of music software, a graphics package and a video capture programme into formats that can be subsequently edited in video editing software. |
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'across a range of devices'

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| <ul style="list-style-type: none">• The common devices that can be connected to a computer and how to connect them, and the hardware and software issues to be addressed in connecting devices directly and indirectly.• That different levels of abstraction are required when displaying information on mobile devices.• The impact, benefits and drawbacks of output through software on-screen and through physical output | <ul style="list-style-type: none">• Example devices include cameras, sound and video recording, output devices, digital measurement and monitoring devices.• Connecting devices to a computer through a cable, wirelessly and through a network.• Abstracting the level of detail for a website that might be displayed on different systems such as tablets and phones. |
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'achieve challenging goals'

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| <ul style="list-style-type: none">• How to manage open-ended or extended activities that promote research, refinement and refactoring
Techniques for breaking a complex project down into component parts.• Informal methodologies for managing and documenting IT projects, using annotations on designs to ensure that they can be revised later. Use prototyping instead of extensive design documentation where this is more appropriate. | <ul style="list-style-type: none">• Creating project planning documents or diagrams such as state-transition diagrams or Gantt charts to support decomposing a larger problem.• Explore RAD methodologies and tools such as SCRUM to prioritise tasks and test and refine digital artefacts.• Use local or cloud-based collaborative environments to collaborate on developing a multi-media product. |
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'collecting and analysing data'

- The types of data, tools for its collection, and how these relate to the purpose and the software used to analyse the data. Designing data collection formats using the suitable approaches for open and closed questioning
 - Simple qualitative and quantitative analysis including creating flat file datafiles and carrying out simple queries. Analysing big data to make evaluations and test assumptions
 - Monitoring and measuring external events with sensors and using physical computing to sense data and manipulate that data.
 - The advantages and disadvantages of human and machine gathered data collection.
 - Designing a data-collection process to test a hypothesis about people in the school eg the relationship between distance travelled, mode of transport, time leaving the house and time arriving at school.
 - Researching online and downloading data sets. Compiling the data into a graphical form using online infographic creation software or applications such as spreadsheets to create charts.
 - Collecting data using micro:bits to monitor heart rate / steps etc in combination with cross-curricular performance data
 - Make use of freely available data sets such as the WWF in order to test hypotheses using filters and querying
- Learning about data collection methods of in-home devices.

'meeting the needs of known users'

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| <ul style="list-style-type: none">• The basic principles of human computer interface design and the presentation of information.• How to abstract users' needs (including users with specific needs) to produce a set of requirements or success criteria for a digital artefact.• How simple user experience testing is used to inform the design of digital products. | <ul style="list-style-type: none">• Developing wireframes for an app or website design and modifying for accessibility issues such as increasing font size, considering colour blindness etc.• Developing a set of user requirements for a home security system for an old person, considering interface design, methods of alerting the old person and others, and the old person's possible responses. |
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Create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability

‘Create, re-use, revise and re-purpose digital artefacts.’

- Use search engines effectively to locate material that is available and appropriate, understanding intellectual property rights, copyright, including ‘all rights reserved’ and that open licensing allows for re-use.
- Convert files from a format created in one application into that needed by another.

- Redesigning a multimedia teaching presentation aimed at secondary aged-pupils for use in primary schools. For example, converting a text based article on a historical topic into a presentation, editing the content, and including other digital content to make the presentation more understandable and engaging for a younger audience.
- Designing the above presentation so it can easily be reconfigured for other occasions.

<ul style="list-style-type: none"> • 'given audience..... design and usability' 	
<ul style="list-style-type: none"> • Evaluate existing artefacts to identify improvements for different audiences or changes in success criteria. • Addressing accessibility for people with disabilities and inclusion of people whose first language is not English. • That modular design supports re-use for different audiences. 	<ul style="list-style-type: none"> • Critique the design of websites or apps from the perspectives of different audiences (e.g input methods, red/green colour blindness etc.) • Design a multimedia presentation for use at a parents' evening which will be attended by peers and parents, considering the different demands of young people and older people, and addressing any potential accessibility or cultural issues. • Adapt a schematic design of a new technology that they have designed which can be adjusted when considering disabilities

<p>'trustworthiness',</p>	
<ul style="list-style-type: none"> • Assessing the trustworthiness of online material, including considering any bias, its plausibility and accuracy. Analysing a URL to assess the source. • Common techniques such as video and image editing to create untrustworthy material, and that 'deep fakes' use to manipulate or generate visual and audio content with a high potential to deceive. 	<ul style="list-style-type: none"> • Identify online sources of advice and views on a topic. Make an appraisal of the extent to which the information can be trusted by establishing its online provenance and point of view.

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

'use technology safely, respectfully, responsibly and securely'

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| <ul style="list-style-type: none">• Storing work effectively and securely locally, on a network and in the cloud, and the benefits and risks associated.• Be aware of their legal and ethical responsibilities, especially regarding their conduct towards others.• What constitutes safe practice when accessing websites and opening email attachments, that secure websites use https, dangers such as Trojans and viruses, the increased risk when using pirated software, and the importance of keeping their computers and software up to date, and of using tools such as virus scanners.• That social engineering attacks exploit weaknesses in users' behaviour to access their data. | <ul style="list-style-type: none">• Using tracer websites to identify routes to and from web servers for viewing pages• Learning about networks such as P2P and Client-Server• Explore different types of utility software and exploring system vs application software |
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'protecting their online identity and privacy'

- That a 'digital footprint' is the data that is stored about a person's online activities and can include information that people have willingly uploaded or that others have recorded about them without their knowledge. That activity on the can be tracked through the user's IP address and browser cookies.
 - Understand the steps they can take to limit access to their personal data. Understand what strong passwords are and how they are used to protect their computers and online data from threats.
- Activities to explore their digital footprint
 - Write algorithms to create password generators exploring ASCII, loops and concatenation for example

'recognise inappropriate content, contact and conduct ... 'how to report concerns''

Detailed guidance is available through the UK Safer Internet Centre

<https://www.saferinternet.org.uk/advice-centre/teachers-and-school-staff/curriculum-planning>