GCSE Computing
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Version 1

OCR

CONTENTS

This guide contains ideas for hardware and software that may be used in the teaching of GCSE Computing. It should be noted that no item on this list is explicitly required for the qualification. This guide includes a selection of resources teachers may wish to use when delivering parts of the specification. Should teachers come across further ideas for resources that they feel would be of value they are encouraged to send them to: resourcesfeedback@ocr.org.uk

ARDUINO

Resource Type: Hardware
Price: Prices vary according to board but start at around £35
URL: http://arduino.cc

Arduino microcontrollers can be programmed to interact with their environment. Plug in simple inputs and output (switches, LEDs etc) or use a variety of shields (sold separately) including joysticks and screens to add more advanced functionality.

RELATES TO

2.1.1 (a) define a computer system

2.1.2 (o) understand the need for input and output devices

2.1.2 (p) describe suitable input devices for a wide range of computer controlled situations

2.1.2 (q) describe suitable output devices for a wide range of computer controlled situations

AUDACITY

Resource Type: Software
Price: Free
URL: http://audacity.sourceforge.net

Open source sound editing software. Students can experiment with the effects of saving sound in different formats and with different sampling qualities. (NB requires LAME MP3 encoder to export to MP3. This is free and Audacity will prompt you to download it when first required.)

RELATES TO

2.1.4 (n) explain how sound can be sampled and stored in digital form

2.1.4 (o) explain how sampling intervals and other considerations affect the size of a sound file and the quality of its playback.

2.1.6 (m) describe common file standards associated with the Internet such as JPG, GIF, PDF, MP3, MPEG

2.1.3 (c) discuss the relative merits of custom written, off the shelf, open source and proprietary software.
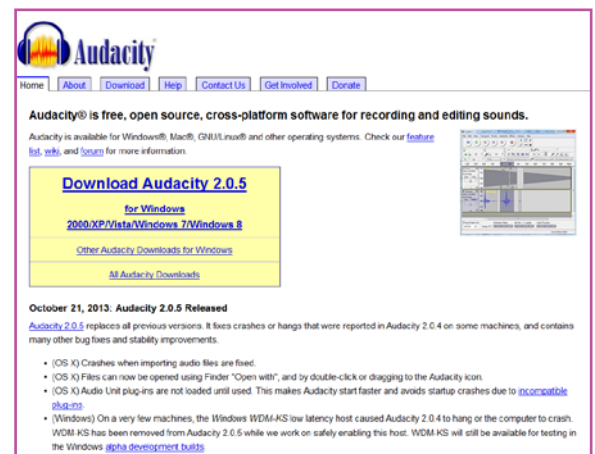
CAMBRIDGE GCSE COMPUTING ONLINE

Resource Type: Website
Price: Free
URL: CambridgeGCSEComputing.org

This free online resource contains Video mini-lessons and teaching notes covering the OCR GCSE Computing syllabus. Could be used as a resource in the classroom, a homework support or to allow a flipped teaching approach.

RELATES TO
Entire syllabus

# CODE ACADEMY

Resource Type: Website
Price: Free
URL: codeacademy.com

Code Academy offers interactive tutorials in a variety of languages. Students can work at their own pace and collect virtual badges as they progress.

RELATES TO
2.1.7 (g) understand and use sequence in an algorithm
2.1.7 (h) understand and use selection in an algorithm (IF and CASE statements)
2.1.7 (i) understand and use iteration in an algorithm (FOR, WHILE and REPEAT loops)
2.1.7 (j) define the terms variable and constant as used in an imperative language
2.1.7 (k) use variables and constants
2.1.7 (l) describe the data types integer, real, Boolean, character and string
2.1.7 (m) select and justify appropriate data types for a given program
2.1.7 (n) perform common operations on numeric and Boolean data
2.1.7 (o) use one-dimensional arrays.

Also good preparation for A453
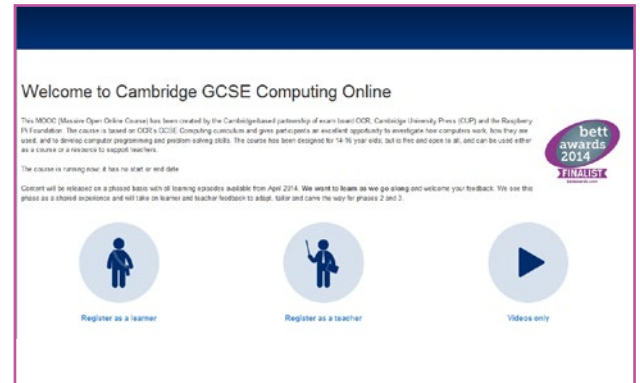
# COMPUTING AT SCHOOL

Resource Type: Website
Price: Free
URL: community.computingatschool.org.uk

Active community of computing teachers, academics and professionals committed to the teaching of computing. The site has a thriving forum where help is always at hand and a large selection of user contributed resources.

RELATES TO

Resources available covering large parts of syllabus
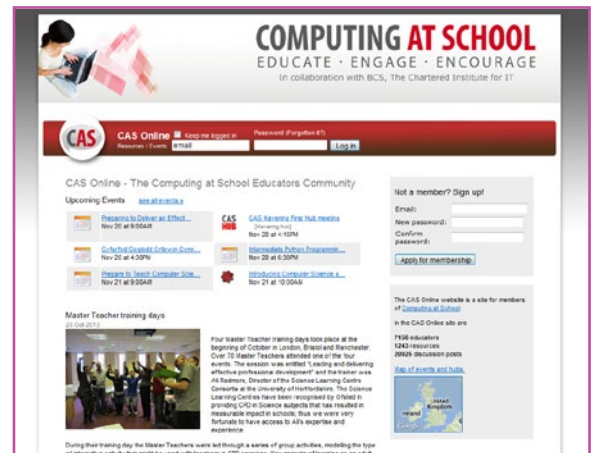
IRFANVIEW

Resource Type: Software
Price: Free
Platform: Windows
URL: irfanview.com

IrfanView is a free image viewer that supports a vide range of file types. Encourage students to compare the effects of different types of compression on images. This program is particularly useful as supports PBM, PGM and PPM file types which can be used to demonstrate how bitmaps are created.

RELATES TO

2.1.4 (k) explain the representation of an image as a series of pixels represented in binary
2.1.4 (m) discuss the effect of colour depth and resolution on the size of an image file.
2.1.4 (l) explain the need for metadata to be included in the file such as height, width and colour depth
2.1.6 (m) describe common file standards associated with the Internet such as JPG, GIF, PDF, MP3, MPEG
2.1.6 (o) describe the differences between lossy and lossless compression.

LIBREOFFICE

Resource Type: Software
Price: Free
Platform: Windows, OSX, Linux
URL: https://www.libreoffice.org/

Open source office package, Can be used to stimulate discussions about the difference between open source and proprietary software. Base the package's DBMS can be used for teaching databases.

RELATES TO

2.1.5 (a) describe a database as a persistent organised store of data

2.1.5 (b) explain the use of data handling software to create, maintain and interrogate a database.

2.1.5 (c) describe how a DBMS allows the separation of data from applications and why this is desirable

2.1.5 (d) describe the principal features of a DBMS and how they can be used to create customised data handling applications.

2.1.5 (e) understand the relationship between entities and tables

2.1.3 (c) discuss the relative merits of custom written, off the shelf, open source and proprietary software.

LOGICLY

Resource Type: Website/Software
Price: Free online version at http://logic.ly/demo/
Downloadable version which includes features such as printing and saving available for $29 per user
Platform: Online version requires Flash Player,
Downloadable version requires Windows/OSX/Linux
URL: http://logic.ly

Logicly allows you to build and test 'virtual' logic gate circuits.
Get students to experiment and test their truth tables using this simulation.

RELATES TO

2.1.2 (e) understand and produce simple logic diagrams using the operations NOT, AND and OR

2.1.2 (f) produce a truth table from a given logic diagram.

NOTEPAD++

Resource Type: Software
Price: Free
Platform: Windows (Will run under WINE for OSX/Linux.
OSX users may wish to consider TextWrangler)
URL: http://notepad-plus-plus.org/

NotePad++ is a feature rich text editor that is 'aware' of a large number of file types including HTML and CSS (It will also recognise most programming languages).
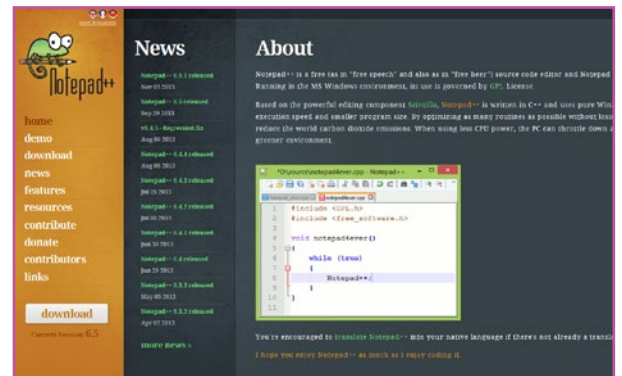
RELATES TO

2.1.6 (l) explain the importance of HTML and its derivatives as a standard for the creation of web pages

May also be useful with A452/A453

RASPBERRY PI

Resource Type: Hardware
Price: £24/32 (depending on model. Power adapter,
HDMI cable, SD card and peripherals not included)
URL: http://www.raspberrypi.org

This £30 computer allows is ideal for those studying computing. Students can experiment with installing different operating systems, using a variety of programming languages and connecting to inputs and outputs. OCR has produced a range of resources to be used with the Raspberry Pi. (insert link)

RELATES TO

Can be used across the syllabus.

UBUNTU

Resource Type: Software
Price: Free
URL: http://www.ubuntu.com/

One of the most popular distributions of the Linux operating system. Give chance to compare Ubuntu to their usual OS. This also gives the opportunity to compare open source and proprietary software. Works well when used with VirtualBox (see below)

RELATES TO

2.1.3 (a) explain the need for the following functions of an operating system: user interface, memory management, peripheral management, multi-tasking and security

2.1.3 (b) describe the purpose and use of common utility programs for computer security (antivirus, spyware protection and firewalls), disk organisation (formatting, file transfer, and defragmentation), and system maintenance (system information and diagnosis, system cleanup tools, automatic updating)

2.1.3 (c) discuss the relative merits of custom written, off the shelf, open source and proprietary software.

VIRTUALBOX

Resource Type: Software
Price: Free
Platform: Windows, OSX, Linux
URL: https://www.virtualbox.org/

VirtualBox allows users to run a virtualised Operating System in a safe, sandboxed environment. Let students experiment with Operating Systems without upsetting network managers!

RELATES TO

2.1.3 (a) explain the need for the following functions of an operating system: user interface, memory management, peripheral management, multi-tasking and security
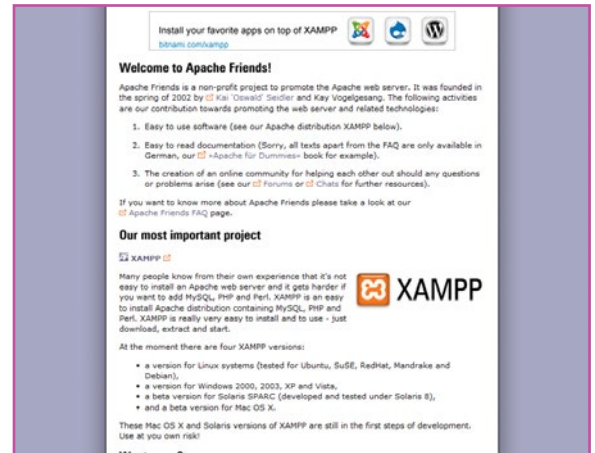
XAMPP

Resource Type: Software
Price: Free
Platform: Windows, OSX, Linux
URL: http://www.apachefriends.org/en/index.html

XAMPP contains Apache, MySQL, PHP and Perl. It allows you to treat your computer as a webserver. Use MySQL for demonstrating a Database Management System.

RELATES TO

2.1.5 (a) describe a database as a persistent organised store of data

2.1.5 (b) explain the use of data handling software to create, maintain and interrogate a database.

2.1.5 (c) describe how a DBMS allows the separation of data from applications and why this is desirable

2.1.5 (d) describe the principal features of a DBMS and how they can be used to create customised data handling applications.

2.1.5 (e) understand the relationship between entities and tables

2.1.5 (f) understand the components of a relational database, such as tables, forms, queries, reports and modules

2.1.5 (g) understand the use of logical operators in framing database queries

2.1.5 (h) explain the use of key fields to connect tables and avoid data redundancy

Also useful for some A452 tasks.

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