

Digital Technologies



Digital Infrastructure



Murray Cullen, June 2010.

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Digital Infrastructure

Agenda

- Background.
- What is expected by these two Level 1 AS's?
- What can be realistically achieved in 30 hours (by non-tech geeks)?
- Starting a discussion on the content and approaches required for the Digital Infrastructure AS's.

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Digital environment and systems stems from the application of basic principles and understanding the components of computers, electronic systems, and networks, to students developing skills in analysing, evaluating, and developing the technical features of networks and digital systems.

Source:

<http://dtg.tki.org.nz/Strands/Digital-infrastructure>

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Students will be able to:

Year 11 - Digital & electronic environment & systems

...apply basic principles and understand the components of computers, electronic systems, and networks

Year 12 - Digital environment & systems

...understand, use, and evaluate the concepts of components, systems, technological features, functions, and limitations of a range of digital technologies

Year 13 - Digital environment & systems

...analyse, evaluate, and develop technical features of networks and digital systems

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Objectives on which the Achievement Standards for the Digital Infrastructure context will be based.

- Demonstrate an understanding of digital infrastructure: hardware, software, networks, and their components
- Be able to design, and evaluate the performance of, a digital infrastructure
- Be able to build, configure and maintain digital hardware and networks, including installing software

Refer to the Technological context knowledge & skills draft for curriculum level indicators and further explanation and examples.

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Previous (Unit Standards)

- US2780 (L2, 9 credits now L1, 3 credits)
- US2781 (L2, 3 credits)
- US2790 (L2, 3 credits)
- US5938 (L2, 2 credits)
- US2783 (L3, 3 credits)
- US2797 (L3, 4 credits)

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Body of Knowledge (Document)

Available for download from either of:

<http://dtg.tki.org.nz/Strands/Digital-infrastructure>

<http://www.techlink.org.nz/curriculum-support/tns/>

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Technology Matrix (June 2010, Draft)

Available from:

<http://www.tki.org.nz/e/community/ncea/technology.php>

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AS consultation

- Digital Technology 1.37
- Digital Technology (Unofficial 1.38?)

Available from:

<https://surveys.researchnz.com/NCEA/Technology/Documents.html>

and email circulated to NZACDITT membership.

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Underlying philosophy ...

Level 1 (Curriculum Level 6)

... a single computer system, the support and management of this system ...

Level 2 (Curriculum Level 7)

... a small number of similar computer systems, connected in a simple network, the support and management of this system ...

Level 3 (Curriculum Level 8)

... a number of widely separated computer systems, connected using a variety of methods, the support and management of this system ...

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Explanatory Note 4.

Students may be provided with a brief which lists specifications of individual components and includes customisation requirements. Alternatively, this standard may be part of a larger project in which the students construct a brief.

(Achievement Standard 1.1)

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Digital Technology 1.37 (Achieved)

Demonstrate understanding of the common components of digital infrastructures involves

- identifying and describing the purpose of the components of digital infrastructures
- describing the typical connections and data flow between components of a digital infrastructure,
- describing the key characteristics of components of a digital infrastructure that limit their interoperability
- describing a procedure or protocol for installing or replacing a physical component or a program

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Key Terms

Common components of digital infrastructures include

Personal computer components, including, but not limited to, power supply, motherboard, on-board components (eg video and network cards, USB ports), CPU, case, extension cards (eg PCI Express)

Simple storage devices and media, including, but not limited to, magnetic and optical disks and disk drives, solid state (eg flash drives) and RAM, Peripherals, eg keyboards, monitors, printers, and other input and output devices

Networking components including, but not limited to, Network Interface Cards, cabling, network devices (such as modems, routers, or switches).

System software, including, but is not limited to, operating system, device drivers, virus checkers, disk utilities.

Characteristics of components are the technical specifications of components that govern how they interact with other components.

A **Procedure** is a sequence of steps that can be followed to install or replace a component.

A **Protocol** is a sequence of steps that must be followed to install or replace a component.

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Digital Technology 1.38? (Achieved)

Implement procedures for installing and configuring hardware, software and peripherals when setting up a customised personal computer system to a given brief involves:

- confirming system compatibility requirements for new hardware, software and peripherals listed in the given brief.
- following standard installation and configuration procedures and protocols for installing hardware, software and peripherals
- undertaking a range of appropriate testing procedures to demonstrate the system meets the requirements of the brief.
- diagnosing and troubleshooting a system to identify and resolve given problems arising from installation faults.

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Key Terms

Hardware includes but is not limited to motherboard, disks, memory, video cards, network cards, cables, power supplies

Software includes but is not limited to: operating systems, system software, drivers, application software

Peripherals includes but is not limited to: monitor(s), mouse, keyboard, printers, webcam, USB hubs, external drives,

Customised personalised computer system means a personal computer system in which the software and hardware has been configured to values and settings to satisfy particular customer requirements. All requirements will be within manufacturer and warranty requirements.

Confirming system compatibility involves identifying specifications of the given hardware, software and peripherals and using appropriate resources and software tools to determine that they are fit for purpose.

Standard procedures and protocols for installing and configuring hardware and peripherals include systematic use of procedures specified in manufacturer OEM manuals, antistatic procedures, electrical safety procedures, and relevant OSH regulations.

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Key Terms

Standard procedures and protocols for installing and configuring software include standard best practice and procedures specified in manuals, installation guides, installation programs, and system documentation including Help facilities.

Installing hardware and peripherals involves assembling and connecting the physical components, identifying any missing or inappropriate hardware components, and acquiring and installing any requisite software such as drivers.

Installing software means acquiring and running installer programs, identifying, acquiring and installing any required system software, and performing any manufacturer updates to ensure that the version is current.

Appropriate testing procedures include, but are not limited to, procedures to ensure that all compatibility issues are resolved, that all connected hardware devices are detected correctly and operate correctly in response to a range of requests, that software programs run correctly alone, and in combination.

Problems arising from installation faults could include incorrect or missing cables, incorrectly installed hardware, missing or incompatible drivers and other system software, and missed steps in software installation.

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Key Terms

Advanced problems arising from installation faults or configuration errors could include: Drivers not available from the manufacturer, older versions of software or hardware required, peripherals not compatible with Mac or Unix OSs, any fault that is intermittent or difficult to identify, conflicts between hardware, conflicts between software, permission issues for software saving and preference files, performance issues that do not stop the computer from working, incorrect software configuration parameters

Incompatibility and Hardware faults could include faulty cables, faulty devices, conflicts in versions of required system software, undocumented interaction between hardware devices and/or software programs, and corrupt software.

A stable personal computer system is one that works reliably and efficiently under all expected conditions.

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Some unanswered questions:

- Are these AS set at Level 1?
- How much content is required for 3 credits?
- Should they be 4 (or more) credits?
- Is this comparable to 3 credit standards in other subjects?
- Will these AS attract students into the subject area?

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Support for teachers:

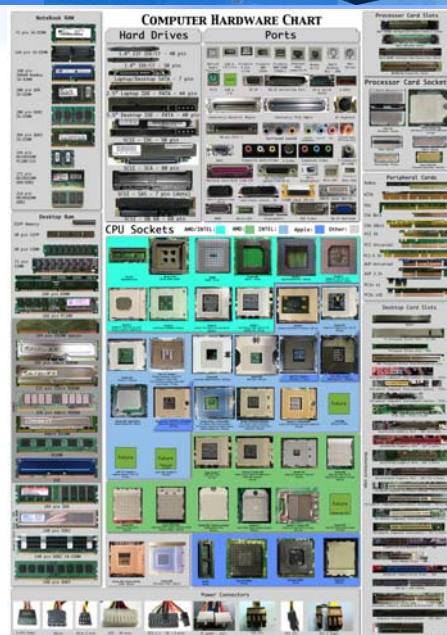
“Teaching and Learning Guide”

– in preparation, due to be released June 2010.

Other resources will become available on:

- <http://dtg.tki.org.nz/Strands/Digital-infrastructure>
- <http://www.techlink.org.nz/curriculum-support/tks/>
- <http://nzacditt.org.nz/>

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This poster is available from the resources area at: <http://nzacditt.org.nz/>

This poster will print up to A2 in size and retain reasonable quality.

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