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Practice IT

for the Australian Curriculum

Book 1
Lower Secondary

ISBN 978-1-316-62393-0

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Teaching notes

Introduction

Practice IT has been developed to provide practical computing activities for students in Year 7 and Year 8. Students have far greater access to computer equipment in schools than ever before and specific Information Technology subjects are being introduced, or current subjects across the curriculum incorporate ICT units; for example, Spreadsheets in Mathematics.

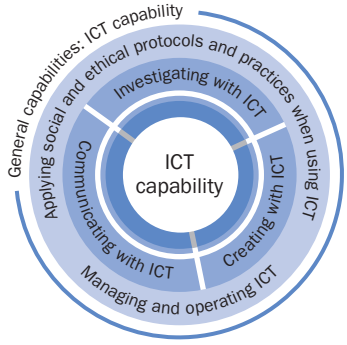
The aim of the book is to cater for both scenarios by breaking the book up into a series of modules. Some modules could be used in current subjects and others in a separate Information Technology subject, or all the modules could form the Information Technology course.

The book also aims to cater for different teaching methods by providing brief instructions followed by an activity.

Alignment with the Australian Curriculum

Information and Communication Technology (ICT) is represented in two ways in the Australian Curriculum (version 8.1). This is through the ICT Capability, which is one of the General Capabilities that applies across all learning areas, and within the Technology curriculum through the Digital Technologies syllabus. Our approach blends theoretical learning with practical exercises, and lends itself particularly to the five interrelated elements of the ICT capability:

- Managing and operating ICT
- Applying social and ethical protocols and practices when using ICT
- Investigating with ICT
- Creating with ICT
- Communicating with ICT



Organising elements for ICT capability

Software

We use a range of software packages in exercises throughout the book, and offer selected exercises in the Interactive Textbook for alternative programs. Below is a list of programs catered for. Note that although new versions of programs are released all the time, book content is still relevant to many versions of the same program:

- **Internet**: Google Chrome, Safari, Microsoft Internet Explorer, Mozilla Firefox
- **Word processing**: Microsoft Word 2013, Microsoft Word 2016, Google Docs
- **Microsoft drawing tools**: Microsoft Office 2013 and 2016
- **Making movies**: Microsoft Moviemaker, Adobe Premiere
- **Multimedia**: Microsoft PowerPoint 2013 and 2016, Google Slides
- **Computer graphics**: Adobe Photoshop CC, Microsoft Paint
- **Spreadsheets**: Microsoft Excel 2013 and 2016
- **Databases**: Microsoft Access 2016, FileMaker Pro
- **Algorithms and programming**: Scratch

Other software may become available. Please check PIT1 Support Files on *Cambridge GO* for updates.

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Teaching suggestions

The modules can be completed in any order. Module 1 ('Computer awareness') can be completed in stages over the two years. Many of the activities could be set for homework. You may also prefer to do the internet and email sections early in Year 7. Module 2 could be used for either year. It would be advisable to do Module 4 ('Drawing tools') before completing Modules 5, 6 and the second half of Module 3.

The following table provides an example of how the modules could be used over the two junior years.

Year 7	
Module 1	Computer awareness exercises 1–7 About the internet exercises 1–7
Module 2	Social and ethical practice in IT exercises 1–6
Module 3	Word processing exercises 1–9
Module 4	Drawing tools exercises 1–13
Module 6	Multimedia presentations exercises 1–9
Module 7	Computer graphics exercises 1–4
Module 8	Spreadsheets exercises 1–15
Year 8	
Module 1	Computer awareness exercises 8–10
Module 3	Word processing exercises 10–16
Module 5	Making movies exercises 1–7
Module 6	Multimedia presentations exercises 10–21
Module 7	Computer graphics exercises 5–8
Module 9	Databases exercises 1–5
Module 10	Algorithms and programming exercises 1–7

Sample projects

Sample projects are provided at the end of each module.

Extension activities

Students who complete all the activities and online exercises can be extended using *Practice IT for the Australian Curriculum: Book 2*.

Sample graphics and text data files

Sample graphics and text data files for use in the modules 'Word processing' and 'Computer graphics' can be found in the Interactive Textbook edition, or in PIT1 Support Files on *Cambridge GO*.

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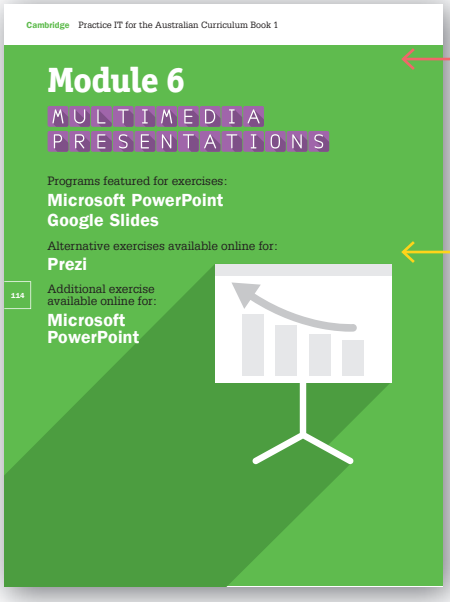
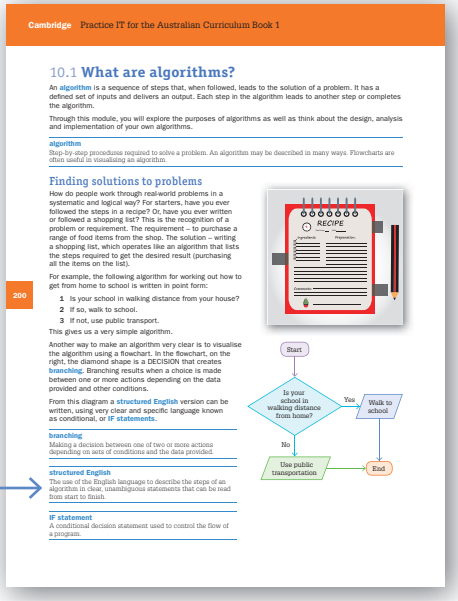
How to use this resource



Module openers clearly indicate which computer programs are featured.

Additional or **alternative** content, to offer further learning support, is available in the Interactive Textbook. This will be explained on the module opening page.

Glossary terms are bolded and defined in the text, and collated at the end of the textbook for easy reference.



The **Teacher information** page is designed to give the teacher an overview of how the module covers syllabus content from the Australian Curriculum.

This information is broken into five sections:

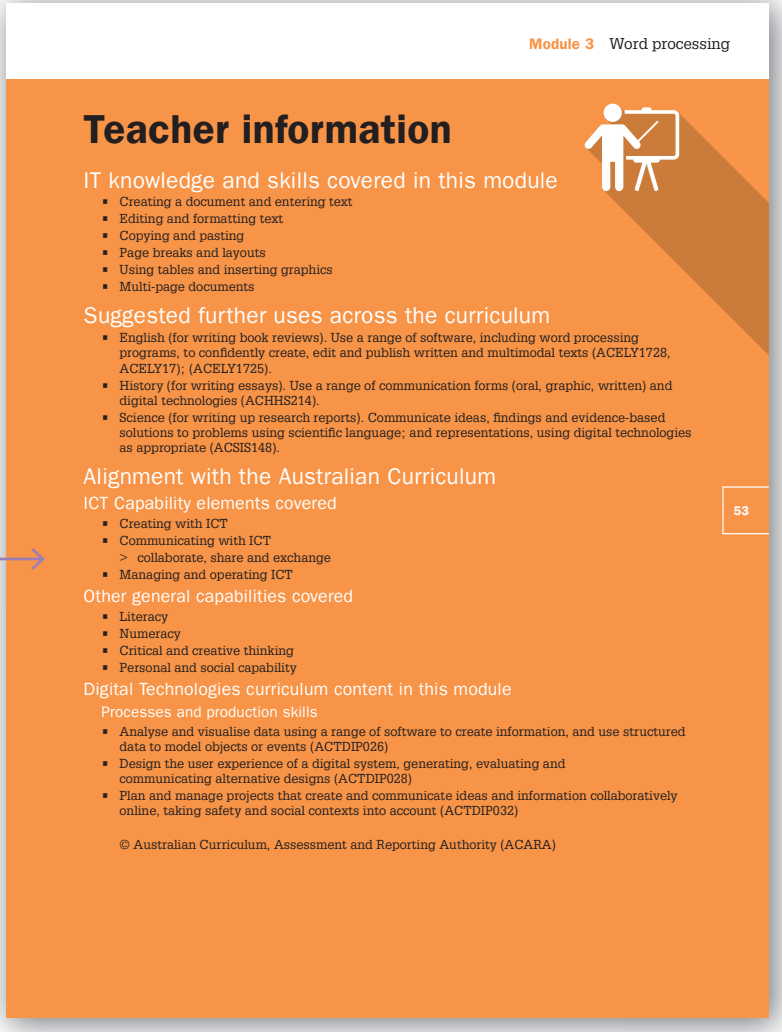
1 a general snapshot of the IT knowledge and skills covered in the module

2 suggestions for how the module could be used across the school curriculum, in the English or Maths areas, for example

3 suggestions for how the ICT capability elements from the AC are addressed in the module

4 a sketch of the other relevant general capabilities from the AC

5 specific content descriptions and codes from the AC's Digital Technologies syllabus, divided between the Knowledge and Understanding and the Processes and Production Skills strands.



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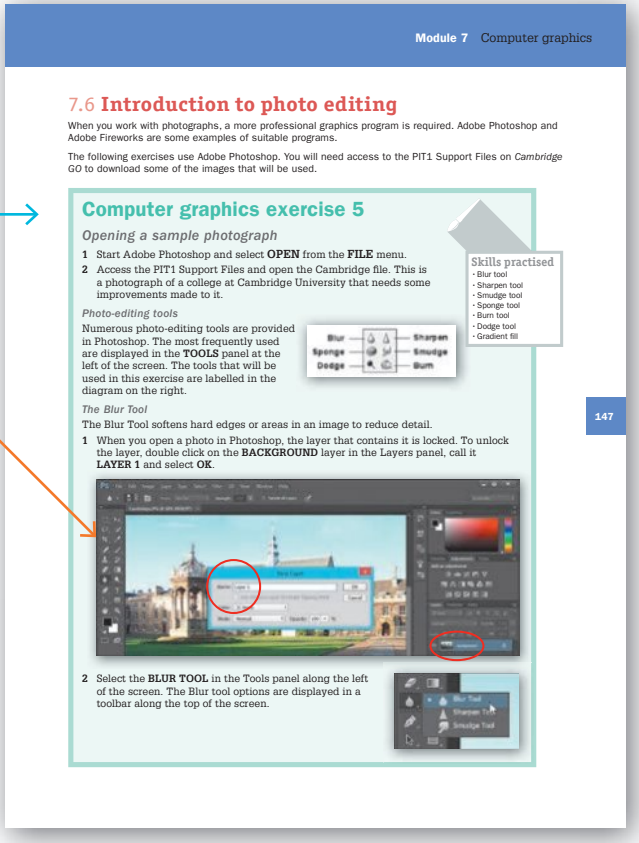
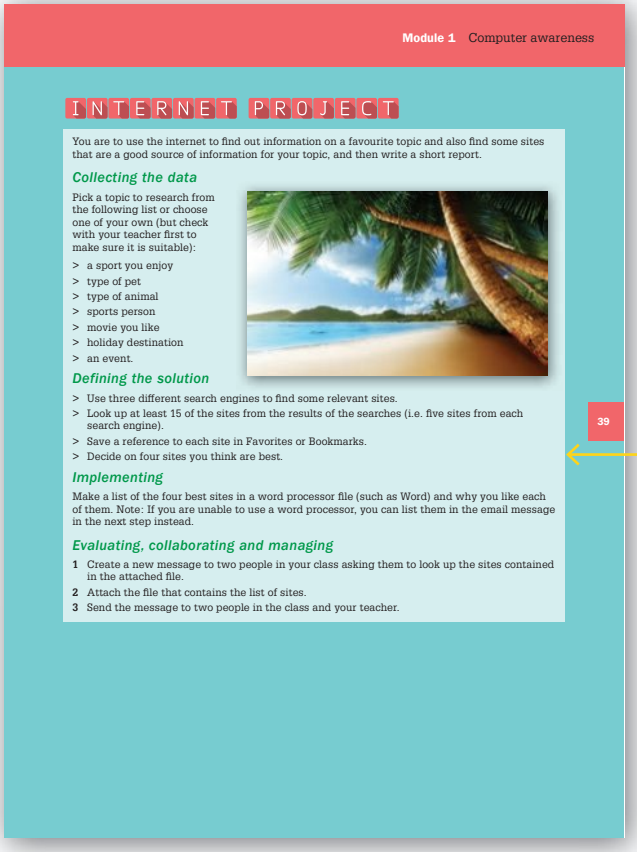
A variety of practical **exercises** explore key concepts, develop skills and draw back to the general learning capabilities of the AC.



Screenshots from computer programs are designed to support student comprehension and bring step-by-step instructions to life.



Projects at the end of each module are designed to get students to test their knowledge of digital technology through the application of IT skills.

Data files include text or images that students require to complete certain projects or practice exercises. Text is provided at the end of projects, such as the word processing module.

All data files are available for download in the Interactive Textbook or in the PIT1 Support Files on *Cambridge GO* for students to use.

In the Interactive Textbook, **instructional videos** enrich the learning experience.

Additional **interactive activities** (e.g. drag and drop or multiple-choice questions) assist recall of facts and understanding of concepts.

All end-of-module projects are available as **downloadable documents**.

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Module 1

COMPUTER AWARENESS

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Teacher information

IT knowledge and skills covered in this module

- How a computer works
- Organising data into files and folders
- Computing terminology
- Computer security

Alignment with the Australian Curriculum

ICT Capability elements covered

- Investigating with ICT
  - > define and plan information searches
- Creating with ICT
- Communicating with ICT
  - > collaborate, share and exchange
  - > understand computer mediated communications

Other general capabilities covered

- Literacy
- Numeracy
- Critical and creative thinking
- Personal and social capability
- Managing and operating ICT

Digital Technologies curriculum content in this module

Knowledge and understanding

- **digital systems** – Investigate how data is transmitted and secured in wired, wireless and mobile networks, and how the specifications affect performance (ACTDIK023)
- **representation of data** – Investigate how digital systems represent text, image and audio data in binary (ACTDIK024)

Processes and production skills

- Acquire data from a range of sources and evaluate authenticity, accuracy and timeliness (ACTDIP025)
- Analyse and visualise data using a range of software to create information, and use structured data to model objects or events (ACTDIP026)
- Define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints (ACTDIP027)
- Evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability (ACTDIP031)
- Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032)

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1.1 Introduction

There is more to information technology (IT) than playing the latest game online or using social media. IT affects every part of our lives, even if we are not aware of it. We have control over some **information systems**, while others are out of our control (we can only trust that those systems are used appropriately).

information system
A combination of digital hardware and software components (digital systems), data, processes and people that interact to create, control and communicate information.

What is IT used for?

IT is used in everyday life – in programmable items such as DVD players, air-conditioning systems and public-transport ticketing.

IT is used in work in office administration. IT is used in healthcare to record patient care, analyse test results and administer medicine and other procedures.

IT is used in communication to access the internet and to send and receive emails and other forms of social media.

IT is used in education to deliver lessons, check student work, produce reports and for research.

IT is used for shopping in computerised registers and computerised stock control.

IT is used for banking to record all banking transactions and to bank online, which has revolutionised the way we do banking.

IT is used in entertainment in gaming, producing music and videos, and animated movies. It is also used to enable distribution via the internet.

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1.2 Recent history of computer development

The following timeline shows the development of the computer industry in relation to significant events in world history. Read through the timeline and see if you can identify the significant computer-related developments.

Computing events	Year	World events
	1945	Hiroshima bombed 
ENIAC, first large-scale computer – today considered the grandfather of digital computers, it filled an entire room 	1946	First images of Earth taken from space
'Bell' transistor – miniature electronic circuits – was a key development allowing computers to become smaller and more affordable	1947	Breaking of the sound barrier
First program to run on a computer created	1948	
First commercially available digital computer 	1951	
Commercial production of silicon transistors	1954	Rock and roll music becomes popular 
Integrated circuits – known as computer chips	1958	First skateboard
	1959	World population reaches 3 billion
Mouse patented 	1963	US President John Fitzgerald Kennedy (JFK) assassinated
Idea for a mouse–keyboard–window screen (called a graphical user interface or GUI)	1964	
Floppy disk 	1967	Australian Prime Minister Harold Holt disappears while swimming
RAM chip	1969	First man walks on the moon 
	1970	Pocket calculator
	1972	CAT scanner

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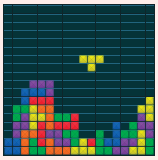
Computing events	Year	World events
	1974	VCR released Cyclone Tracy hits Darwin World population reaches 4 billion
Microsoft founded by Bill Gates and Paul Allen 	**1975**	Colour TV comes to Australia
Apple founded by Steve Jobs and Steve Wozniak	**1976**	
	1977	Rubik's Cube *Star Wars* 
Space Invaders (computer game) 	**1978**	First test-tube baby born
First portable computer released	**1981**	Prince Charles and Lady Diana married
Apple Lisa – first graphical user interface CD-ROM First proper laptop	**1983**	Ash Wednesday bushfires 
Apple Macintosh released 	**1984**	Carl Lewis wins four gold medals at the Los Angeles Olympics
Windows released The first dot-com domain name is registered	**1985**	Tetris invented 
	1986	*Challenger* space shuttle catastrophe
Microsoft releases Works	**1988**	World population reaches 5 billion
Word for Windows	**1989**	Berlin Wall falls
Tim Berners-Lee develops Hypertext Markup Language (HTML), giving rise to the World Wide Web First version of Adobe Photoshop	**1990**	

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Computing events	Year	World events
First website is made available online for the public 	**1991**	
First Microsoft Encarta Pentium microprocessor advances the use of graphics and music on PCs	**1993**	
Digital camera Zip drive PCs become gaming machines for the first time	**1994**	Election of Nelson Mandela in South Africa 
Windows 95 First feature-length computer-animated film released: *Toy Story* 	**1995**	Pay TV comes to Australia
The Google search engine is developed by Sergey Brin and Larry Page	**1996**	Dolly the sheep becomes the first successful cloned mammal 
	1997	Death of Princess Diana
Apple iMac Windows 98 	**1998**	
Wi-Fi – users begin connecting to the internet wirelessly Year 2000 bug scare (Y2K)	**1999**	World population reaches 6 billion
First ebook, by Stephen King First camera phone	**2000**	Sydney Olympic Games
	2001	September 11 World Trade Center attack 
3-D printer creates working animal kidney	**2002**	First Bali bombings
Apple iPod 	**2003**	Iraq war

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Computing events	Year	World events
Social networking site Facebook launched Broadband internet use widespread	2004	Boxing Day tsunami in Thailand
YouTube was created For the first time in the US laptops outsell desktops	2005	Second Bali bombings
The One Laptop Per Child (OLPC) initiative begins	2006	Pluto no longer considered to be a planet 
Apple iPhone revolutionises the smartphone Amazon Kindle ereader 	2007	Global financial crisis starts
	2008	Barack Obama elected President of the USA 
Windows 7	2009	Global financial crisis ends
Instagram	2010	WikiLeaks head Julian Assange arrested
Apple iPad	2011	Steve Jobs passes away World population reaches 7 billion 
Facebook reaches 1 billion users Windows 8 Raspberry Pi 	2012	
	2013	Scientists clone human stem cells
	2014	Malaysia Airlines flight goes missing ISIS attacks northern Iraq 
Windows 10 Apple Watch 	2015	Ebola crisis
	2016	Olympic Games in Rio de Janeiro

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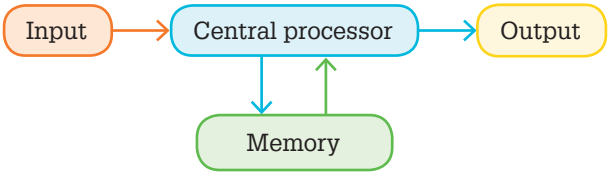
Computer awareness exercise 1

Computing history

From the timeline information and your own knowledge, identify the top five most important developments in the history of computers, in your opinion. Share your list with the class and be prepared to justify your choices.

1.3 How a computer works

When the term computer is used, the traditional personal computer or laptop comes to mind. There is now a vast range of items that are actually computers. The most commonly used and recognised computer is the smartphone. However, no matter what type of computer system you use, they still work the same way:



A computer system has these basic elements that are either hardware or software:

- device for input of **data**
- internal memory or port for data storage
- central processing unit for processing of data within casing
- operating software
- device for output of information
- power source – battery and/or electrical cord
- port to connect to other devices.

data
May include characters (for example, alphabetic letters, numbers and symbols), images, sounds and/or instructions that can be manipulated, stored and communicated by digital systems.

For example a digital camera is a small computer. It has:

- device for input of data – camera lens
- internal memory or port for data storage – data card
- central processing unit for processing of data – internal processing unit
- operating software
- device for output of information – display screen
- power source – battery
- port to connect to other devices – USB port.

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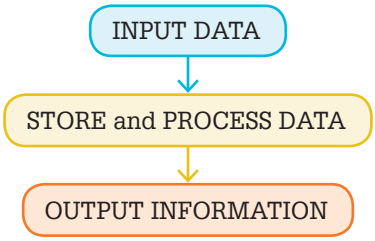
1.4 Computer hardware

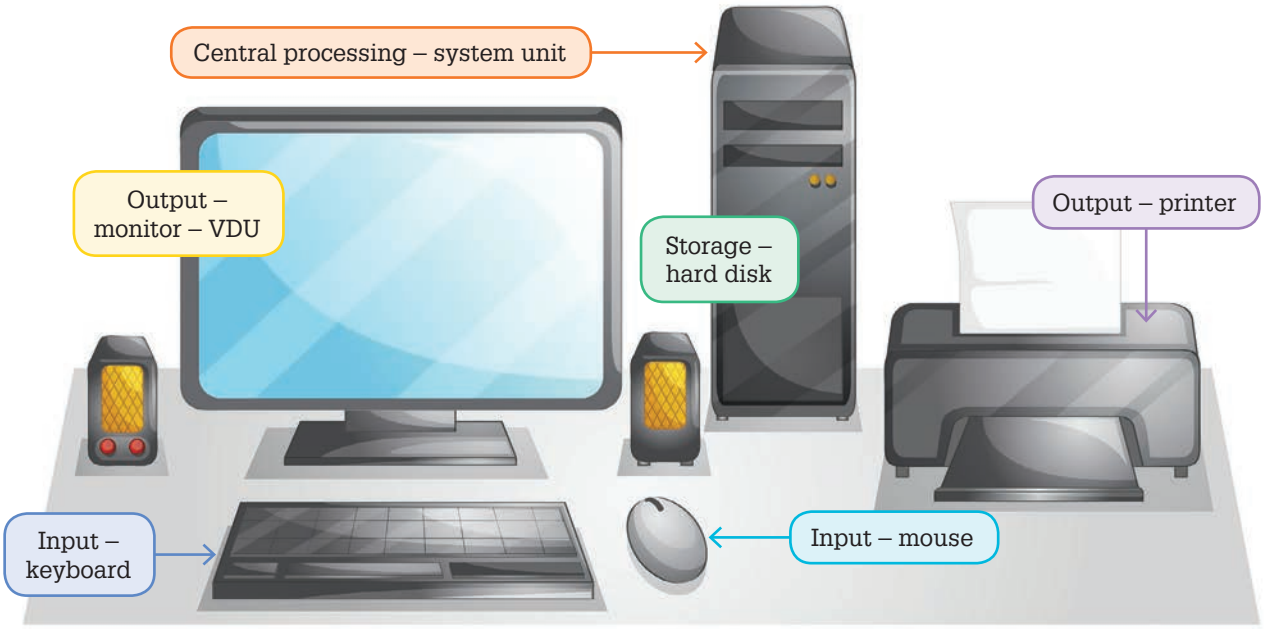
In general, a computer allows us to:



Below are the typical **components** of a traditional computer system that enable each of these phases.

components
Parts or elements that make up a system or whole object and perform specific functions.

The power of a computer lies in its ability to store and process data. However, the computer must have a way of getting the data into the central processor. Input devices such as the camera lens, keyboard or mouse are used to input data.



Once the data is input, it is stored in various types of memory until it is required. There are primary and secondary storage areas.

A computer can also manipulate or modify the information, such as presenting it in various ways or performing calculations. A computer can only do these things because of applications located on the system unit. An application is just a set of instructions to the computer on what to do with the data we input.

The result of processing data is information that can be output using devices such as the screen and the printer.

The input and output devices are often called peripherals. The mouse and keyboard are common input devices. The screen and printer are common output devices. There are many other devices we can use to get data into the computer and information out. Some input and output devices are listed on the next page.

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Input devices:

- keyboard
- mouse
- scanner
- modem
- camera lens
- recorder
- stylus pen
- optical mark reader
- joystick
- touch screen
- touch pad
- microphone

Output devices:

- screen – visual display unit
- printer
- plotter
- modem
- digital projector
- speakers
- synthetic speech
- flash drive

Computer awareness exercise 2

Input and output devices

Copy this table into your workbook or computer. (You will need about 12 rows.)

Input devices	Output devices

Write the names of these hardware devices in the Input devices and/or the Output devices columns of your table.

Camera lens	Modem	Scanner
Mouse	Screen – VDU	Joystick
Optical mark reader	Touch pad	Keyboard
Plotter	Touch screen	Stylus
Printer	Projector	Microphone

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Computer awareness exercise 3

Peripheral devices

Choose six **peripheral devices** (three input and three output) and find out some information about them. Write a paragraph about when the device is used and what type of data is entered or output using the device. For example, a visual display unit is used to display the results of using a program, such as a picture you have created in a graphical application.

peripheral device
A digital component that can be connected to a digital system but is not essential to the system (e.g. printer, scanner, digital camera).

Computer awareness exercise 4

Computerised devices

1 Find three examples of computerised devices at home or in your local area.
2 Identify the input device used to put data into the computer. What is the job of this device?
3 Identify the output device. What is the job of this device?

Examples of devices on which you could focus are:

> mobile phone
> microwave
> supermarket cash register
> automatic teller machine (ATM).

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Computer awareness exercise 5

Computers and places

Think about the places you or your family visit in a week and take note of any computerisation that you observe.

1 List at least two places you have visited.

2 What is the purpose of the computer being used in each place?

3 How big is the computer in physical size (i.e. hand-held, desktop)?

4 How many people can use the computer at once?

5 What other places could use a similar computer? For example, a library uses a computer to record information about books, record borrowing and borrowers' details. This type of computer usually has several terminals, so many librarians can use it at the same time. A computer could also be used to produce flyers and other documents such as posters and book reviews.

   Other places you may visit that use computers are:

   > schools
   > supermarkets
   > doctors' surgeries
   > sports centres
   > large retailers
   > small retailers
   > post offices.

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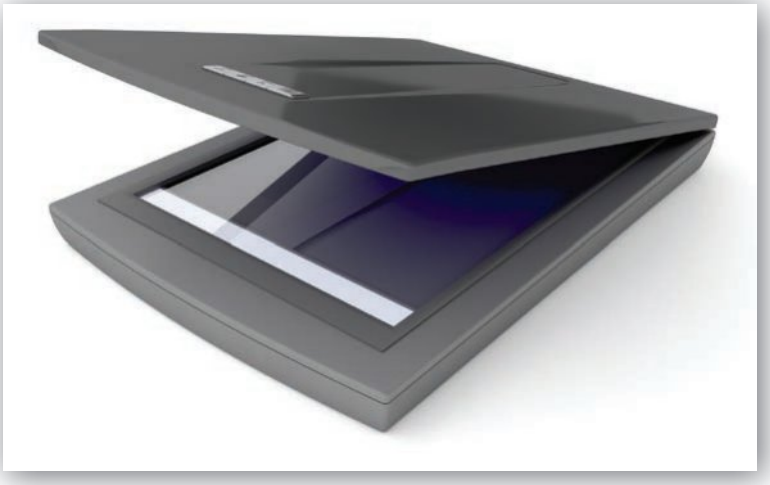
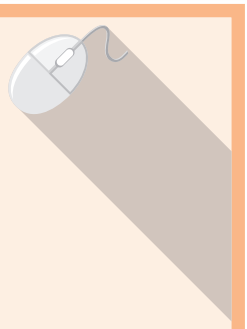
1.5 The development of technology

As the range of input and output devices increases, the range of tasks a computer can perform improves. This means that many more people can be helped by the use of a computer.

For example, in relatively recent times the main method of getting text into a file was to use the keyboard. Scanners improved on this with special software that enabled blocks of text to be scanned into a file. With the development of voice-recognition software and appropriate hardware, many people can now enter text and give commands simply by speaking to the program. This is an amazing development for people who have physical difficulties with typing.



Computer awareness exercise 6



Voice-recognition software

1. Investigate online how voice-recognition software works. Ensure that the online sources you choose are from legitimate websites.
2. What hardware do you need to use voice-recognition software?
3. What advantages would this type of software have over typing?
4. What disadvantages are there in using this software?
5. Draw a diagram illustrating how voice-recognition software works.

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Entering pictures into a document was once limited to using Clip Art or drawing a picture from scratch. Scanners improved this with the ability to scan a picture into a file, which could then be inserted into a document. Now digital cameras can take pictures directly, then the digital picture can be inserted straight into the text file.

Computer awareness exercise 7

Digital cameras

1 Find out how a digital camera works.
2 What hardware do you need to use it?
3 What advantages are there to having a camera in a smartphone?
4 What advantages are there to using a digital camera instead of a camera in a smartphone?

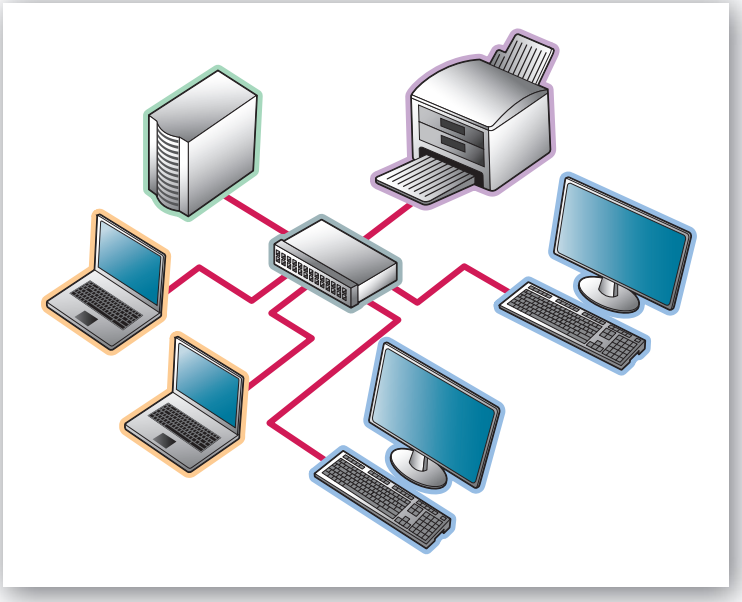
1.6 Network communications

Communications components such as modems are now part of a standard computer system. Later in the chapter you will learn more about modems. The ability to network computers and other digital devices greatly improves efficiency. A network is created when two or more computers and other devices are connected by a modem, network cable or **wireless device** technology. Each point on the network that connects a device is called a node. A network within a small area (such as a room), building or buildings close together (such as a school or hospital) is called a local area network, better known as LAN.

This diagram illustrates a typical network structure where all the computers can communicate with each other. One computer acts as the host or server.

wireless device
A device that transmits and receives data from other sources, using electromagnetic radiation (e.g. radio waves) rather than being connected by electrical conductors such as wires.

There are many benefits in using a network, the main being the need for fewer peripheral devices. Prior to networking, each computer would probably have a printer connected to it to print documents. In a network, only one printer is required as each computer communicates with the printer via the network. Other advantages lie in the ability to access files and applications on other computers and communicate via internal email.



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1.7 Computer software

So far we have talked about hardware in a system. The hardware will only work as well as the programs and applications that coordinate it to process the data to become information. The software cannot actually be seen. You can see the result of using the program or application on the screen display. You can see the DVD or disk it is stored on but you cannot see the actual program. Software programs and applications are just a set of instructions that determine the steps that a processor performs when it processes data.

Software types

There are four main categories of software in a computer system:

- application software
- operating system software
- utility software
- programming languages.

At this stage you will just look at application software and operating system software.

Application software

Application software, or apps, determine how the data is processed to produce information; for example, Microsoft Word, Instagram, Google Docs.

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Operating system software

A computer's operating system is a system program or programs that control the operations of a computer. The operating system determines how each hardware component of the computer system is used. Common operating systems are Microsoft Windows, Linux and Apple Mac OS, IOS and Google's Android.

The operating system enables us to print a document while at the same time opening a file or entering text. On a smartphone you can conduct a phone call while checking messages or using other apps.

The operating system also provides an interface between the user and the programs. The interface – sometimes known as the graphical **user interface** – makes the device much more user friendly.

An operating system is used to:

- start apps up and then close them down
- create files such as photos and store them
- manage the location of saved files
- control peripheral devices such as printers and scanners.

An operating system is the base program on which other applications run. Together they form a **digital system**.

user interface
Characteristics of the boundary between users and a computer system, or the manner in which users interact with computer hardware or software.

digital system
Digital hardware and software components (internal and external) used to transform data into a digital solution. When digital systems are connected, they form a network.

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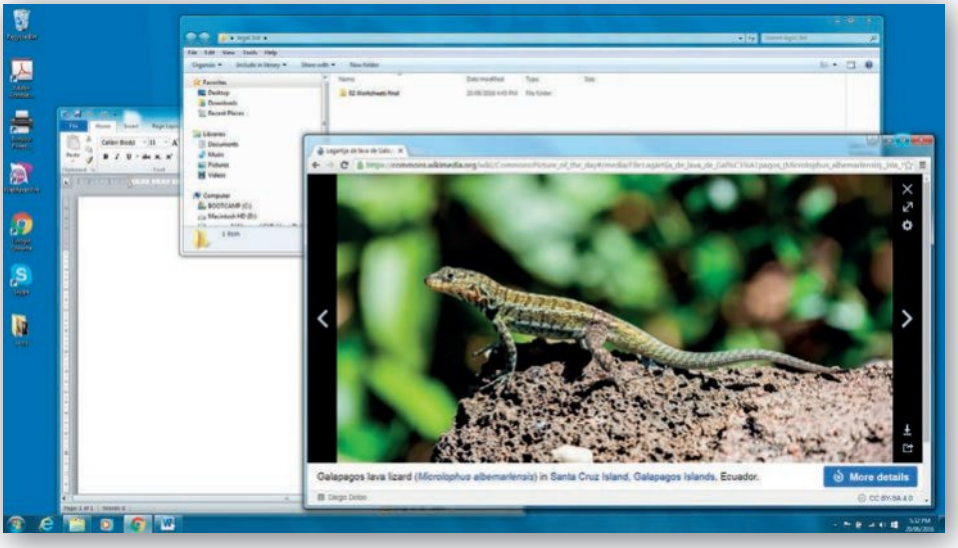
1.8 Graphical user interface

The name says it all:

- **Graphical**: Indicates the use of pictures (icons) and colours.
- **User**: For the user of the computer or device.
- **Interface**: Between the user and the computer operating language that we would prefer not to have to use, similar to having an interpreter in a foreign country where we don't understand the language.

The graphical user interface (GUI) is a type of interface that allows users to interact with electronic devices through visual indicators and graphical icons. Microsoft Windows is a commonly used interface, which has made working on computers much easier and more efficient. The Windows GUI makes it easy for us to use a computer or device because:

- we can use a mouse or fingertip to do things quickly
- applications have a consistent look
- we can have several applications and files open at once.



Smartphones have a graphical user interface to help you access the various functions now commonly available on them.

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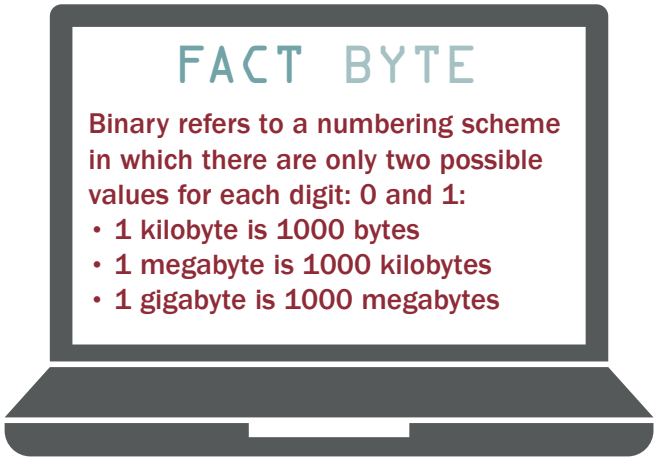
Storage devices

The computer system must have some way of storing data, information and applications internally. Some common methods of external storage are memory sticks or flash drives and CDs.

Building blocks of memory

There are various types of memory devices but they are all based on bits. A bit is the smallest unit of storage:

- **Bit**: One bit is the smallest unit. It is the building block of all pieces of data. The term bit is derived from the term binary digit. A bit is represented by either a 1 or 0. 1 is on, 0 if off.
- **Byte**: A byte is a group of either 8, 16, 32 or 64 bits. Memory on the computer is divided into bytes. Each character stored uses about one byte of memory. So the word elephant would use about eight bytes.



Primary storage

Primary storage is the term given to internal memory that will temporarily store the data and information, and program instructions while they are in use. It is located within the central processing unit. RAM and ROM are the two main types of primary storage:

- **ROM** (read only memory): The device can read information that is stored here – as the name suggests. 'Read only' also means other information cannot be stored here (i.e. it is one-way). The information stored in ROM is input as it is being manufactured. It is not possible to change or delete this information. It generally holds the information required to start the device. The information is stored here regardless of power supply.
- **RAM** (random access memory): This is the memory used while processing is in progress. It is a two-way memory in that it both stores and recalls data at any time as long as there is a power supply. Once the power supply is turned off, any data in the RAM is lost unless it has been stored on another secondary storage device (which is discussed further on the next page). The RAM stores the operating system, any application currently being used and the data required for that application.

Secondary storage

Secondary storage is for permanent storage of data and information. It does not rely on a power supply as it uses magnetic or sometimes optical systems to store data. This enables a device to be turned off but data retained for use at a later date. It also stores programs that are not in use. Secondary storage is capable of storing enormously larger quantities than primary storage. Once other portable methods of storage are used, the amount of storage available is unlimited.

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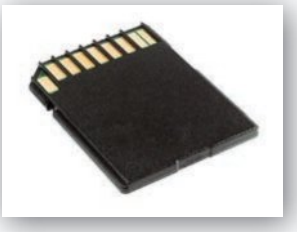
There are various secondary storage devices:

- **USB flash drive**: Also commonly known as a 'thumb drive' because of its size. The USB flash drive is a small memory device that can be connected to a computer via a USB port. Newer computers usually have USB connectors at the front of the computer, so they are easy to connect. A flash drive can store between 128 megabytes and a terabyte of data. The more memory in the device, the more expensive it is to purchase. Data can be stored and erased as required; however, a flash drive does have a limit as to how many times this can be done without performance being affected. These are generally used on PCs and laptops. A flash drive is also used when a mouse or keyboard is wirelessly connected to a computer.



- **Memory card**: Inserted into devices such as laptops and digital cameras, they increase memory available for data storage.
- **External hard disks**: Popular as a way of transporting large amounts of data, capacity can vary and cost increases with capacity but is generally more expensive than the equivalent capacity in an internal hard disk because the technology is different.

- **Internal hard disk**: These can store hundreds of gigabytes to several terabytes. The hard disk or disk drive is really just a collection of disks similar to a stack of CDs. Data or information stored here can be retrieved at any time from any location – this is called random access. It is similar to the ability to pick out a track on a CD without first playing the preceding tracks. It is permanently located within the unit – unlike the others, which are all portable.

Disk storage

- **CD-ROM**: Can store about 650 megabytes permanently. Primarily used as a permanent source of a program. It is often used to store video tutorials and large books such as encyclopaedias.
- **CD-R and CD-RW**: Writable CDs are a comparatively cheap form of storage. The CD-R is a write-once, read-many medium, while the CD-RW can be erased and new data saved, similar to a disk.
- **DVD (digital versatile disc)**: Holds over four gigabytes of data including sound and audio. A DVD drive connects to a computer in a way similar to CD-ROMs. However, the disc can be double-sided and even two layers with double sides giving a total of 17 gigabytes. Because of their size, DVDs can be used to store full-length movies.

- **Blu-ray** or **Blu-ray Disc** (BD, BRD): A digital optical disc data storage format. It was designed to supersede the DVD format, in that it is capable of storing high-definition video resolution.

Cloud storage

Files can also be stored offsite in the Cloud. Cloud is the term given to offsite storage where the files are transmitted via internet technology (cable, wireless, ADSL, etc.).

The Cloud is really just the storage available from internet service providers. Don't be confused by some products that are called My Cloud, which can be physically attached to your computer or device in your home or office. These are just an external hard drive product cashing in on the name Cloud.

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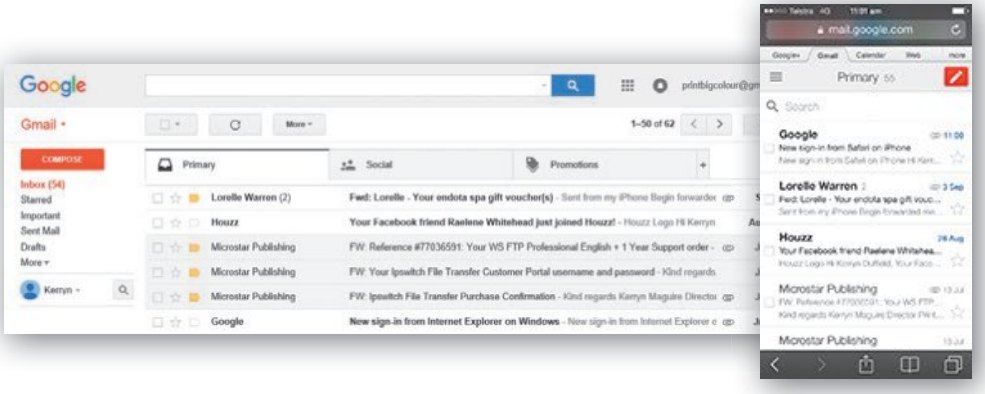
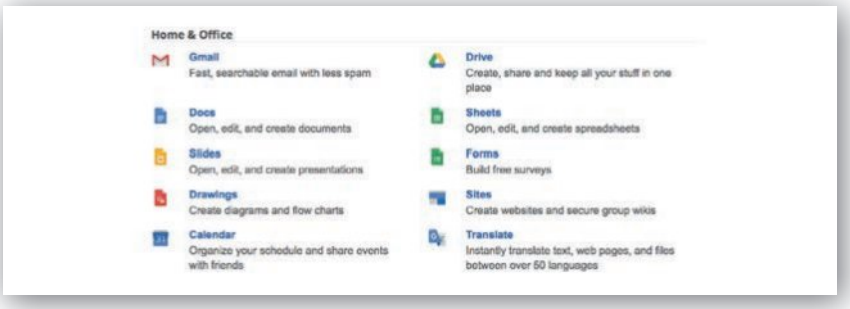
Below is a diagram of how a range of devices can connect to the Cloud.

iTunes is an example of Cloud computing. You purchase tunes on iTunes and download them to your phone, for example. They are still stored in the iTunes Cloud. You can also access them, for instance, from a PC over the internet, as well through the iTunes app. iTunes has stored information about which tunes you have purchased in the past. You can choose to download the tunes to your PC – all, some or none.

Cloud computing can be well explained using the services provided by Google. In other books in this series you have used Google to search the internet for information. Google has been operating as a Cloud service for free for quite a while. If you have a Google Mail account – your messages, photos and other attached files are stored on their servers. This is why you can access your Google Mail from any computer or device that has access to a web browser.



Google also has a range of apps that you can use to create documents in your area of the Cloud. This means you do not need to have software loaded on your PC, laptop, tablet or phone – the software is located in the Cloud and you create and store the documents there.



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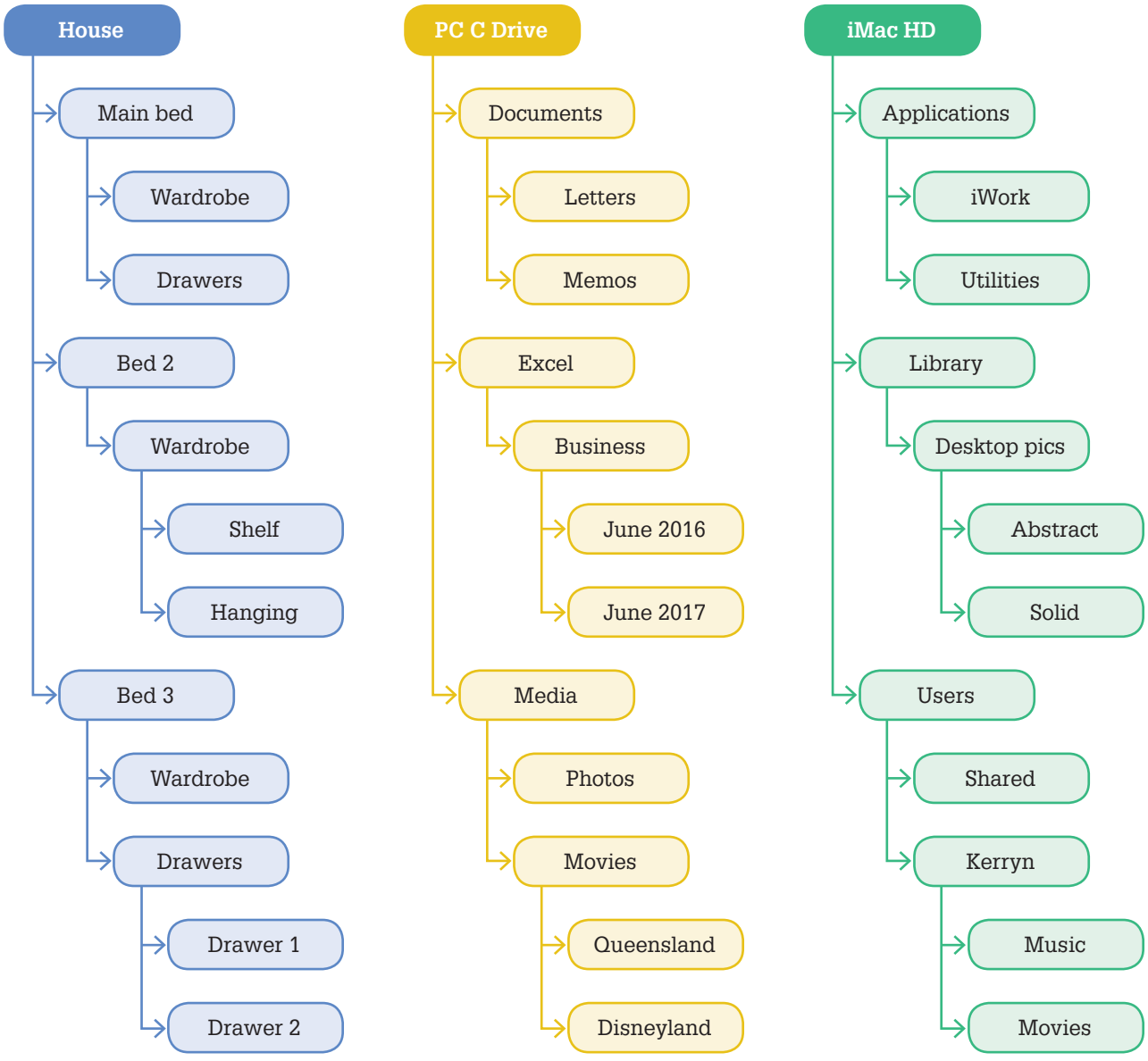
1.9 Organising data into files and folders

Memory needs to be organised. This is achieved using files and folders. Any work that you create and save with a computer is stored in a file. You provide the filename for the work that you create. A file stores information or data. Hundreds of other files exist on the computer that you did not create. These files are installed onto the computer when the software is loaded. Each time you install a new game or app, more files are copied onto the computer.

A computer uses many different types of files in order to operate. A program consists of many different files. Some files make the program run, while others provide the graphics, audio and so on. The size of a file depends on how many bits and bytes it contains.

Folders are containers for storing files. If your hard disk had only one folder to hold all your files, it would be very difficult for you and your computer to find files, making tasks very slow. It would be a little like having only one cupboard in your house to hold all your stuff. Or think of a library without any shelving. In the same way that organised storage helps a household to run more efficiently, folders and subfolders help a personal computer to operate efficiently. Files are grouped in a logical manner into folders.

Files and folders are managed using File Explorer in Microsoft Windows and Finder on a Mac.



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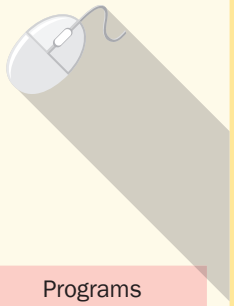
Computer awareness exercise 8

Computer terminology



Below is a list of terms that have been covered so far in this book.

1 Create clues for these terms.

2 Use these to construct a crossword in your workbook.

Bit	Byte	Process	Keyboard	Programs
Digital	Memory	RAM	Draw	Modem
Recorder	File	Mouse	ROM	Network
Scanner	Folder	Output	Screen	Graphical
Peripherals	Speakers	Input	Plotter	User
Interface	GUI	Printer	Cloud	

1.10 Computer security

We use our computers for more than just playing games. We use them to create letters, projects and pictures. Businesses use computers to record sales and purchases, business plans and other information. The information we store on computers is often very important and needs to be protected. We need to protect it from physical damage or theft. We should also protect it from other people trying to use it without our permission. In addition to this, we need to be aware of where we save our files and from where we get our information.

Passwords

Information security is improved if access to the system is limited to authorised users. User IDs and passwords can be used to enable access to the system.

User ID

As part of a network, a network administrator will usually assign a user ID to a user to indicate that they are an authorised user of the network. A user will then also choose a password that only they know to sign into the network. This ensures that only authorised users will have access to the network.

Passwords and pins

Good password policy will improve the protection provided by passwords:

- the ability of users to keep passwords and user IDs to themselves (not giving out their user ID and password to friends or other students)
- the suitability of the password (e.g. repeating your user ID as a password would be very easy to guess, as would using your name or something personal and easy to guess such as your birth date or nickname, etc.)
- regular changing of passwords.

Access rights

You may wonder why a user ID is required as well as a password. The user ID is used to assign the user access rights to parts of the network. The network administrator can control which files, software and hardware a user can use by assigning access rights. For example, data-entry operators would not have access rights to sensitive financial data and reports. The rights assigned can also be limited to say 'read' rights, where you can only open and view a file, so no editing can be done.

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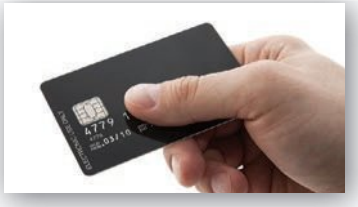
There are other methods available to ensure access to a secure system depending on the hardware available and the device.

Fingerprint scanners

Fingerprint scanners require the user to place their finger on the scanner to prove their identity before access is provided. This is an extremely secure method as each person's fingerprints are unique. Fingerprint scanners are a more secure method of providing access than smartcards.



Smartcard reader

Smartcards are similar to a credit card. The individual's credentials are stored on the card so that access to the computer or device such as a printer is enabled based on the correct credentials.

Computer awareness exercise 9

Passwords

1 How does your school secure access to its computers?
2 What is a good way for you to protect your files?

Backup data

Backing up is an easy way of protecting our data from loss. To backup is just to make a copy of a file and, ideally, keeping it somewhere away from its usual location in case of fire or theft. Backup files can be stored on CDs or DVDs, flash drives or a portable hard drive. You can also save files in the Cloud.

Backups should be performed regularly – you should always think in terms of *when* the files are ruined or lost rather than *if*, because that will help you to remember to backup often. It is better to take a few minutes to do it rather than regret it later when you lose your files because you don't have a backup.

If you are wondering how often you should do backups, just think of how much work you would have to redo if something happened to your files. You are responsible for your own files – do not rely on others to look after them.

Computer awareness exercise 10

Computer security

1 How does your school do backups?
2 What is an easy and reliable way for you to do backups?

Computer viruses and malicious applications

There are various steps you can take to protect your precious data from a malicious attack, including:

> Load software onto your computer that will protect you from viruses, malware, spyware, etc.
> Load a Firewall onto your computer.
> Try not to use other people's thumb drives – you don't know where they have been!

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- Always scan emails, files and programs for viruses. Never open attachments without saving and scanning first. Be wary of attachments even from people you know, particularly if you are not expecting them.
- Update the antivirus, firewall, etc. protection software regularly.

There are many advantages to using security software. The main ones are:

- Security software scans files and disks for known virus files and software that will cause problems for your computer.
- The security software may also remove the problem file or give instructions as to how the user can remove it.
- The security software may also repair sectors damaged by viruses and malware.

Firewalls

Another way to protect your computer is to activate a firewall. Firewalls work like a security door inspecting data as it enters an organisation's network. Without a firewall a virus can enter into an organisation's network before it is detected. If you think of a network like a house with many rooms, each lockable from the inside, a virus gets in the front door and can then attack any room that is left unlocked.

Many organisations would never dream of leaving their front door unlocked at night and relying on each employee to lock their respective offices. Yet they leave their network open to malicious attack by not setting a firewall application in place.

A firewall works by monitoring traffic in to and out of your computer. The speed with which it can do this is an important aspect of a firewall. A firewall checks all emails, files and every piece of data before allowing it into the network. The pieces of data are compared to a **database** of known problem data, much the same way as scanning for viruses and other malicious apps. If a match is found, the data is blocked and so prevented from reaching the network.

Increased use of the internet and the sophistication of hacker activity have inspired the increasing use of firewalls for personal computers. Windows has a firewall installed and turned on. You can find it via the control panel. If you install a firewall from another provider, you will need to turn this firewall off.

database
A collection of data organised by records and fields that can be easily stored, accessed, managed and updated. Interaction with a database usually takes place through a user interface designed specifically for the structure and use of the data stored in it.

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Computer crime

Computer crime is the illegal use of a computer system for personal benefit. Some common criminal acts are:

- stealing data from a company system
- deleting data from a company computer system
- altering accounting records and other administrative data.

Many computer crimes are difficult to prove. It is often very difficult to identify who committed the crimes because the person may have used another's password to access the system or have a complex pathway of access into the system.

Hackers

Hacker is the name given to people who try to access systems by guessing passwords or other measures to access the system. In an effort to combat hacker activity, it is now an offence to gain access to the computer without authority.

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Malicious damage

Viruses and other malicious applications can cause serious damage to computers. It is often difficult to determine who originally sends or creates the virus or app. It is also difficult to prosecute the person even if they are found.

Computer theft and fraud

Computer theft covers a wide range of crimes. People might steal data from a computer that does not belong to them. For example, an unhappy or spiteful employee at a large company might steal sensitive financial information and reports from a computer and sell it to a rival company.

Stealing software or computer equipment is also a crime, just as is stealing any item that does not belong to you.

Another way of stealing software is by making copies of it. This is called software piracy. It is illegal to make copies of software and other files such as copyright music and movie files and distribute them to your friends or sell them.

Computers as criminal tools

A computer has many uses for criminals today to perform other offences. For example, counterfeiting money is much easier now with the use of a computer. Identification cards and credit cards are also much easier to fake using a computer and digital printer. Scams are much easier to conduct using emails.

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1.11 Communication – internet and email

The internet has opened the world to an explosion of possible communication between hundreds of millions of people across all continents. Businesses can use the internet to advertise and publish information, buy and sell goods and services, and access information – from competitors' prices and travel timetables to the latest business news and government documents.

They can send and retrieve electronic mail from colleagues and clients, link computer networks across national borders, transfer files from one location to another and conduct banking services such as transferring funds, paying bills and checking account balances.

Internal and external networks

Networks are created when computers are connected to each other in order to communicate and share resources. In your school, if your computer is linked to other computers in the same area, the network is known as a local area network (LAN). If your computer is linked to a school in Melbourne, Sydney, Bendigo or some other city or town, then the network is a wide area network (WAN). The internet is a worldwide collection of many thousands of computer networks. It is a network of networks that can relay data and information within seconds to almost anywhere around the world.

The development of the internet

The internet began in the United States in the early 1960s. The Department of Defense's Advanced Research Association (ARPA) developed a small network to allow the sharing of information between military personnel and scientific researchers. This was called the ARPANET.

ARPANET was enhanced to withstand a military attack from an enemy by maintaining communication even if one or more of the computers became unavailable. The system was based on a standard set of rules called protocols that defined how computers would communicate, much the same as people have implicit rules for speaking to one another.

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The ARPANET grew to include universities throughout the USA and a few overseas. The military became concerned that the increased use of the network may jeopardise national security and decided to sever its links with the ARPANET. This paved the way for academics to expand their use of the internet and business interests to initiate commercial use of what has become the internet.

Today, no organisation or body owns the internet but it is regulated and controlled by some responsible authority in each country, normally a communications company. Until 1995 Australia's part of the internet was regulated by the Australian Academics Research Network (AARNET), which was funded by universities and other academic institutions. These days Telstra is responsible for maintaining the required infrastructure and coordinating all access to the internet across Australia.

Who uses the internet?

Scientific researchers and university academics

We know that scientific researchers and university academics were active in the early beginnings of the internet and their involvement continues today. They use the internet for distributing, searching and retrieving files and articles, corresponding via email and providing educational sites involving audio, visual and interactive capabilities.

Business organisations

Business organisations use internal email extensively on their networks, but also access the internet to communicate nationwide or worldwide. They promote business ideas and concepts, advertise and trade goods and services, and check on the competition.

Government

Governments distribute documents such as recent policy development, legislation and parliamentary transcripts. Government departments, at all levels from local to national, use email extensively and provide information on current issues for public benefit and services provided by the government.

Online education

Online education is a growing area touching students from primary to tertiary levels. Students in school on one side of the world can chat with students in another part of the world, get help for their next assignment from an electronic library or access a virtual expert on a range of subjects from maths to medicine. Universities use the internet to distribute educational material, course information, conduct tests and publish end-of-semester results. Online and interactive learning enables people living in remote locations to have the same educational opportunities as people elsewhere.

The individual

The internet does not restrict anyone from using its facilities and people without a computer at home can log on from libraries, schools, work, cybercafes or smartphones, which now also have browsers installed. People can play interactive games, read online books, go shopping, pay bills, look at the stock market fluctuations, check out the sports results, read today's newspaper or browse from site to site – otherwise known as 'surfing the net'.

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About the internet exercise 1

Using ICT tools to help others

Your grandmother wants to take her love of quilting global! She has run a small club for years, but now wants to spread her enthusiasm wider than the local area. However, she has never used the internet for anything other than writing emails before. She has called upon you for your expert opinion on how she can promote her club online to attract new members and move the discussion of quilting to the internet. What ICT tools would you recommend? The requirements are the ability for your grandmother to:

- easily manage the project online
- add new members
- post messages to a group
- host group discussions
- post images of quilts.

1 In pairs, research the types of ICT tools currently available and weigh up their pros and cons.

2 In a few sentences per pair, explain the ICT tool your group recommends.

3 Explain and justify why you chose this tool over another suitable alternative. What made one better over the other?

The future – where do we go now?

Just think of our daily activities compared to those of your parents or grandparents when they were young – no ATMs, faxes, email or mobile phones. No social media. So where are we heading? The information superhighway is changing the way we live. What future is in store for us and how will the internet influence it?

Hardware and software requirements

A newer computer provides greater speed and memory than an older computer for accessing the internet. This will make the experience more fun as it can be quite frustrating when waiting lengthy periods for information to download. That's why some people call the internet the 'World Wide Wait'. If you have a computer that's more than a few years old, don't throw it out just yet, it will still do the job and may suit your initial requirements.

The basic requirements for access to the internet are:

- a computer
- a modem
- a telephone line connection or cable
- communication software
- an account with an internet service provider (ISP).

A modem is a piece of hardware that converts digital signals from the computer to analogue signals that can be transmitted across the telephone line (known as modulation) and converts the analogue signals received from the telephone line back to digital signals for the computer to use (known as demodulation). As the technology has developed, these signals can also be converted via wireless broadband towers, similar to mobile phones. Most new computers have an internal modem. External modems are also available for older computers.

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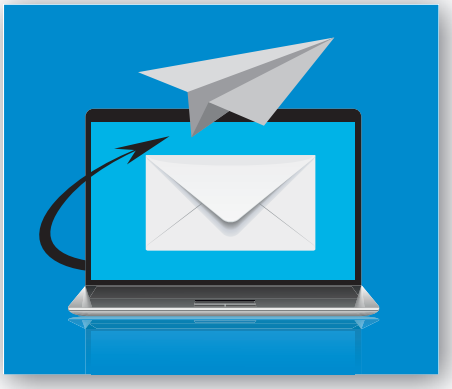
A normal telephone line connection used at home or work is all that is necessary for connection to the modem. Some households install another line for accessing the internet so that phone calls can still be made and received on the original line. Most users now install ADSL, cable or wireless connection so they can utilise the advantages of broadband.

The communication software required for connection to the internet is provided free by the internet service provider (ISP) once you open an internet account with them. An ISP is an organisation or individual that provides a permanent connection to the internet through a host computer and then sells access to the public. The installation process sets up the configuration details the computer needs for connection to that particular ISP. Most ISPs also provide extensive technical support if you ever run into trouble.

Internet features and services



The main internet services available to users are:

- the World Wide Web
- electronic mail – better known as email
- mailing lists
- usenet
- Internet Relay Chat (IRC)
- File Transfer Protocol (FTP)
- electronic commerce (ecommerce).

World Wide Web

The WWW is a web of information stored as documents and files of various types located on websites throughout the internet. The WWW requires a software application called a browser, such as Netscape Navigator or Internet Explorer, to connect to the web. This allows websites to be accessed and information downloaded to your computer. Every page of information on the WWW has a unique address, known as a Universal Resource Locator (URL).

Email

Email is extensively used and a great innovation for anyone with access to a computer. It allows short notes, letters and large documents to be electronically transmitted anywhere in the world within a matter of minutes. An email address comprises a user ID, an @ symbol and a domain name. The user ID is the user's identification; the @ symbol is pronounced 'at'; and the domain name identifies the internet service provider host computer among all the computers on the internet.

Some example email addresses are:

- gurus@bigpond.com.au
- proberts@iname.net.au
- info@vic.gov.au
- sales@elliots.org

Mailing lists

Mailing lists are an extension of email. An originator (list owner) advertises for people to share information and opinions on a particular topic and provides an email address to contact if you are interested in subscribing. The originator compiles the list of participants' email addresses and sets up the mailing list. When information is posted to the mailing list email address, all subscribers receive the information.

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Usenet

Usenet operates as a collection of bulletin boards or notice boards known as newsgroups. Unlike mailing lists, no one person is responsible for developing or maintaining these groups and anyone can start a newsgroup. Each newsgroup covers one particular topic and can be used by any number of people by emailing to the newsgroup and sharing opinions on the topic and replying to other messages. Application software such as Internet News is required to access these newsgroups.

Internet Relay Chat

Internet Relay Chat (IRC) is the party line of the internet enabling many people to electronically chat at one time. Messages sent by participants are displayed on the screen, allowing all other participants to reply. There is a certain etiquette to these chat groups and participants are expected to use the greetings 'hello' and 'goodbye' appropriately.

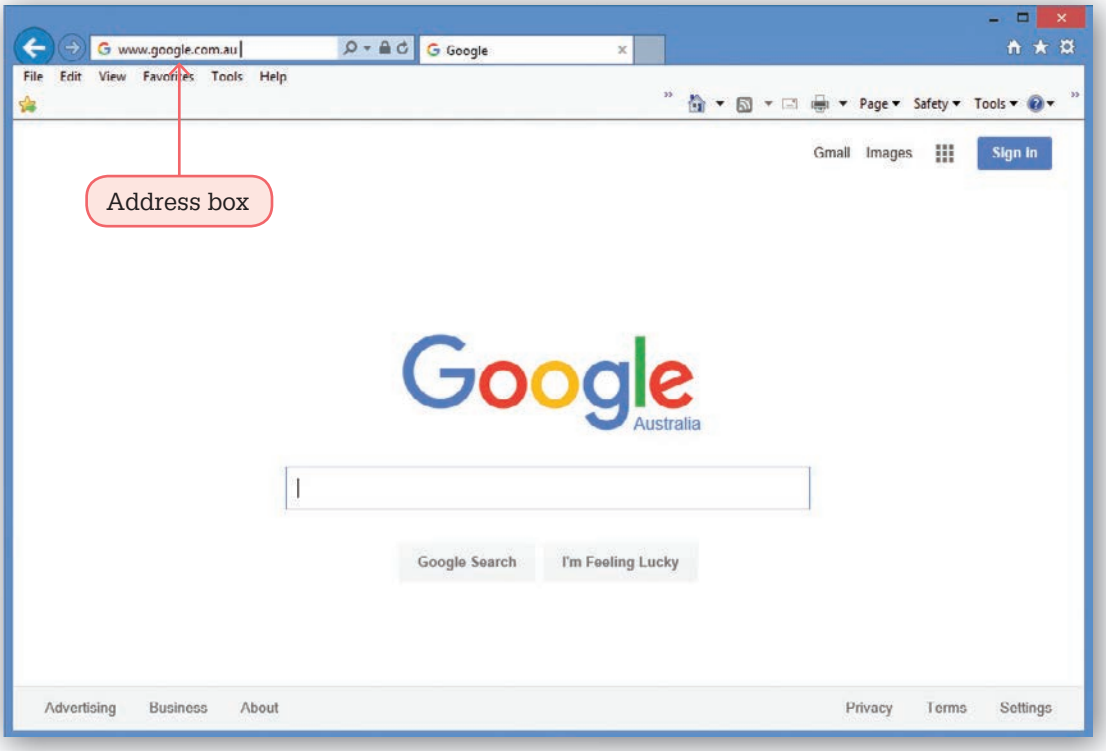
Web address (URL)

Every page on the web has an address, also known as a URL (Universal Resource Locator). The address box is used to enter the address (URL) of the website you want to view. It also displays the address of the website page currently on the screen. If you have the specific address of a website, you can go directly to it.

A web address is like a telephone number – no two web addresses are the same. Web address structure is standard all over the world. It generally starts with the file protocol (http or ftp), followed by the domain name and then any page names.

1. Open your internet browser.
2. Click on the address box.
3. Delete any text that appears there.
4. Type the web address for Google Australia and then press the `<Enter>` key.

The website for Google will open. Yours may look different from the page shown below.



Google is what is known as a search engine. It is useful to find sites based on a subject. Suppose you want to look for some information to do with travelling:

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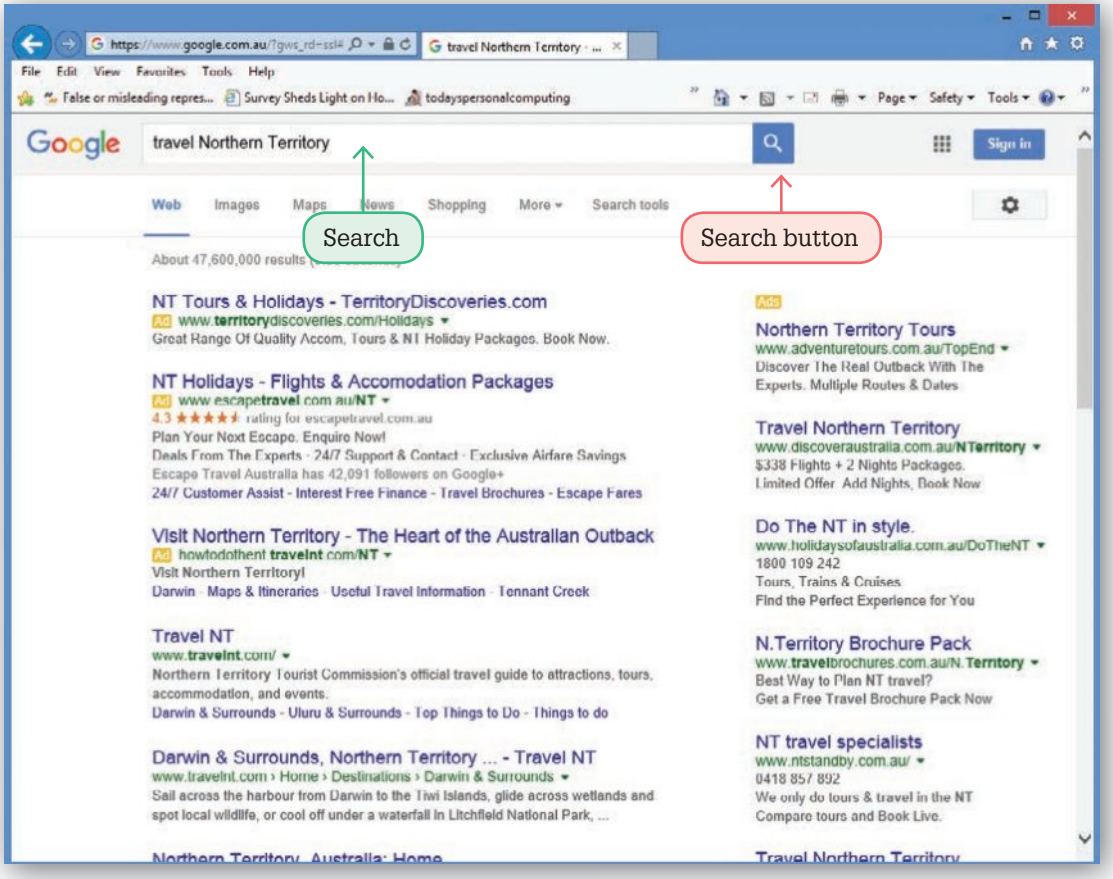
1 Type `travel Northern Territory` in the search box.
2 Press `<Enter>` or click on the Google Search button. Google will search all the websites around the world in an attempt to find any that focus on travel and the Northern Territory. Because it is a rather broad term, the resulting number of sites will probably be large. In this instance, more than 47 million sites were found.
3 Click on one of the pages listed.



4 The webpage will open in your browser. From here you click on the hyperlinks – also known as links – to areas of interest. Click on one of the links on the page. The next page will appear.

Moving around a website

A website is usually made up of several pages linked with hyperlinks. When you click on a hyperlink, the browser will display the webpage that is linked via the hyperlink. Hyperlinks are indicated in two ways. Any text that is underlined is usually a hyperlink. More recently, text that is not underlined can also be a hyperlink. Some hyperlinks also appear in the form of buttons or images. The mouse pointer will change from an arrow to a hand when it is over a hyperlink.

Move the mouse over the page and watch it as it changes to a hand and back to a pointer and then a hand again as it moves over hyperlinks. The page to which the hyperlink is linked will appear. You can make further moves around the site by clicking on other hyperlinks and surfing the net.

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About the internet exercise 2

Using search engines

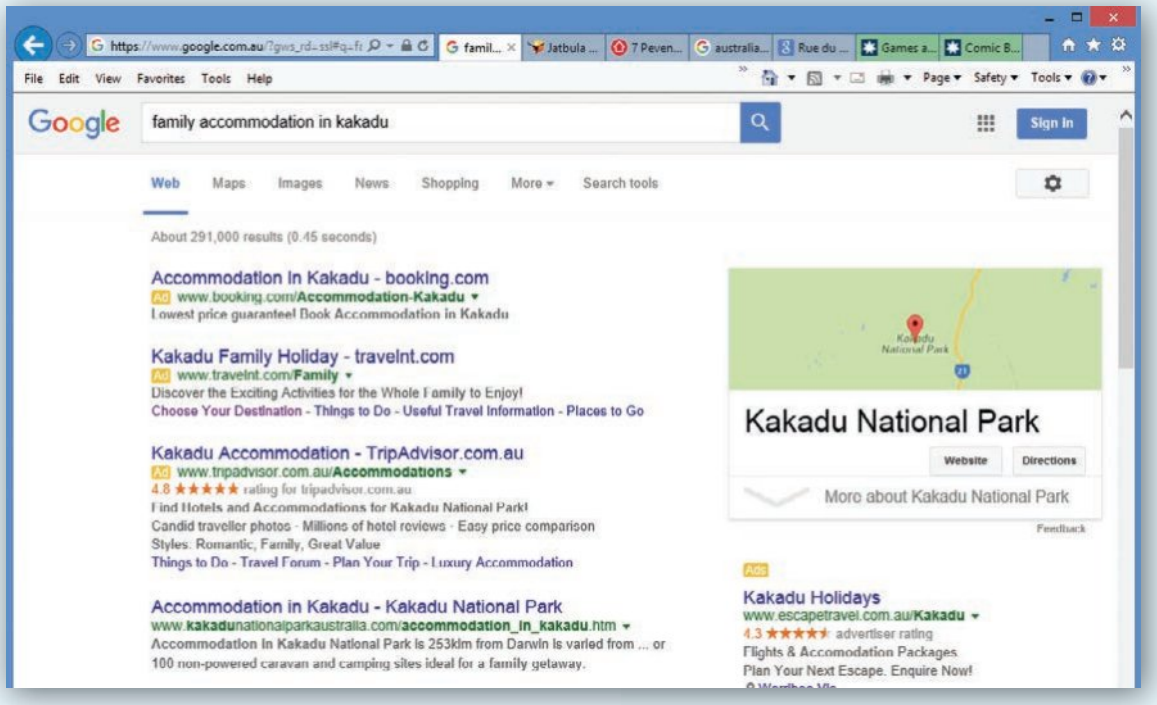
A search can be more efficient with more words. For example, just using the term 'accommodation' will produce more sites that are irrelevant than using the more specific 'accommodation in Melbourne'.

Another factor that will affect the results is the variance between the search engines. You can type the same phrase into each search engine and they will come up with slightly different results.

Google

1 Click on the address box and type in the address for Google Australia.

2 Type `family accommodation in Kakadu` in the search box and press `<Enter>`.



Yahoo!

1 Now try the search engine Yahoo! Click on the address box and type in the address for Yahoo!.

2 Type `family accommodation in Kakadu` in the search box and press `<Enter>`.

3 What is similar about the search result?

4 What is different?

Ask

1 Now try the search engine Ask. Click on the address box and type in the address for Ask.

2 Once again, type `family accommodation in Kakadu` in the search box and press `<Enter>`.

3 What is similar about the search result?

4 What is different?

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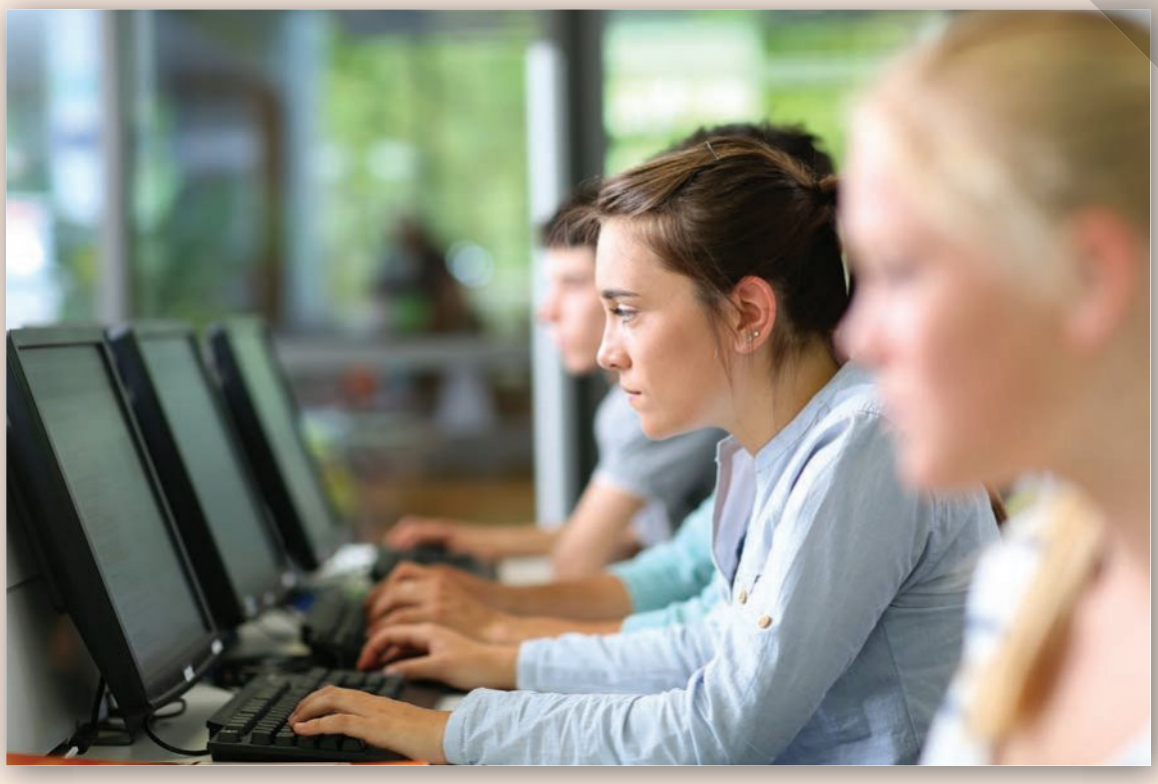
About the internet exercise 3

Using search engines

Use each search engine again to locate an identical term, and then compare the results.



Useful information?

Not everything you read in newspapers and magazines is true. The same applies to the internet. Anyone can put anything on the internet, but publishing it does not automatically make it true. The likelihood of the information being true depends on the author, the date and whether the information is fact or opinion.

Who is the author – are they credible?

Suppose you are looking up information on how to care for a dog and find two sites you think look useful – one by a dog lover, the other by a veterinarian who specialises in pet care. Both sites may have useful information; however, the information provided by the veterinarian is more likely to be factual (i.e. based on study and research), while the information provided by the dog lover is more likely to be anecdotal (i.e. based on personal experience). Even in newspapers many columns are based on opinions, not fact. Simply because someone displays their opinion on an issue does not necessarily mean that it is true or correct. You must consider the author's reputation and qualifications in presenting the information.

When was it written?

What is the date of the information or when was the page last updated? If you are looking for information on the weather, would a page that was last updated two days ago be more or less reliable than a page updated half an hour ago? Would information available on cancer treatment that was last updated a month ago be more reliable than a page that was last updated five years ago? Sometimes, however, the date is irrelevant, as the facts will not change, such as with historical data.

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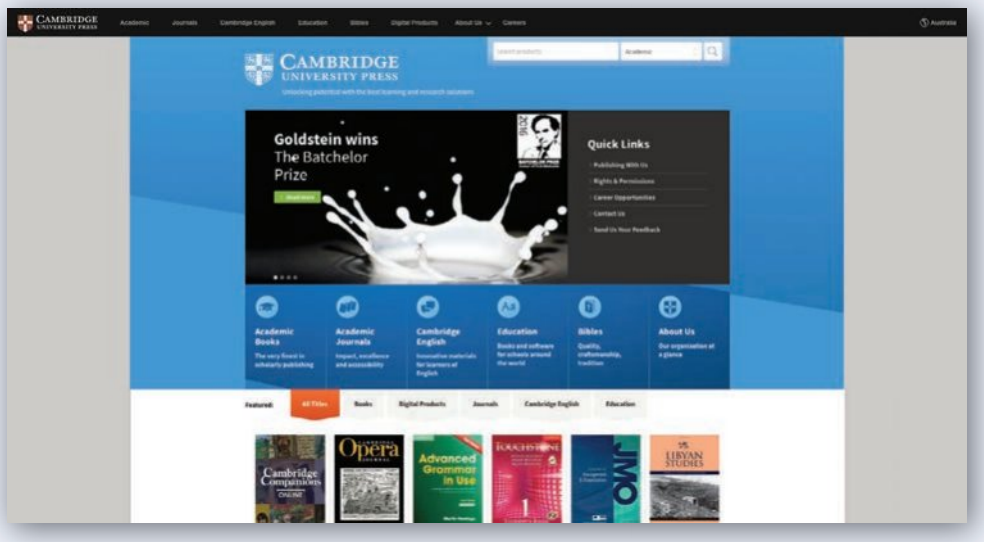
Cambridge University Press

About the internet exercise 4

Advanced search

1 Find the Cambridge University Press site for Australia.



a Find the name, address and phone numbers of the branch in your city or the closest city to you.

b In the Education – Secondary section, find out how many different subject categories of school books are sold by Cambridge.

2 Locate the *Cambridge GO* page. What do you think the acronym GO stands for?

3 In *Cambridge GO*, visit the Science & Technology section. Which series has a cheetah on its landing page?

Bookmarks or Favorites

A very useful way of retaining up-to-date information is to store a reference to a site in Bookmarks in Safari or Favorites in Internet Explorer. Then when you want to view the page again you just open the site from Favorites or Bookmarks. This is great for sites you happen to stumble across and want to refer back to. When you want to visit them again you can simply use the reference listed in Favorites or Bookmarks rather than hunting around for it again.

About the internet exercise 5

Add a webpage to Favorites or Bookmarks

1 Do a search for something you're interested in.

2 Display a page from the search results that you think will be useful.

3 Click on the **FAVORITES** or **BOOKMARKS** menu then the **ADD** command – the name of the site is automatically entered. At this point you can rename the reference with a more meaningful name if appropriate.

4 Close the **FAVORITES** or **BOOKMARKS** window.

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About the internet exercise 6

Looking up a site in Favorites or Bookmarks

Next time you want to access the site from Exercise 5, just use Favorites or Bookmarks.

1 Click on **FAVORITES** or **BOOKMARKS** in the web toolbar.
2 Click on the site reference you want to display.

Sending and receiving email

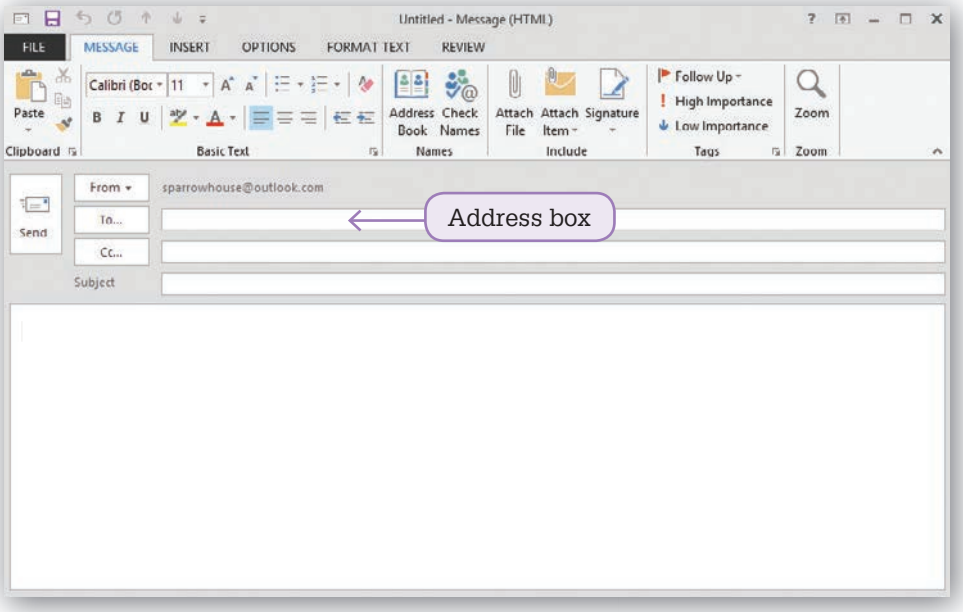
Put simply, email is messages sent via a network. The network may consist of a small network of several computers in an office to the huge network that is the internet.

A sender sends a message to the central storage area called the server. The message remains there until the intended recipient pulls down the message. There are many applications that make sending and receiving mail very easy.

Creating a new message

The main components of an email message are:

- **Address**: Who is it to? Actual email addresses are needed for people outside your organisation or school network. Mail must be addressed to the person who is to receive it. An accurate address is an absolute must for the message to get to the right person. An example of an email address is billbrown@bigpond.com.
- **Subject**: What is it about? The subject is placed in the subject field at the top of the email, like a heading, and should let the recipient know what the message is about (e.g. Subject: Birthday party invitation).
- **Message**: The text in the message. This is where the actual message is entered. You can generally enter as much text as you need to here as well as add attachments (explained further on the following page).



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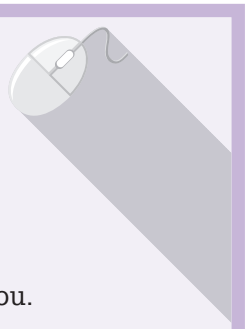
About the internet exercise 7



Create a new message

1 Create a new message to the classmate on your right.
2 Type their email address in the **TO** box.
3 Type the subject text `Hello` in the **SUBJECT** box.
4 Type a short message that says hello and also asks them to reply to you.
5 Hit **SEND** to mail the message.
6 Repeat steps 1 to 5 to send a similar message to the classmate on your left.

Replying to a message

Messages you receive are listed in your inbox. Replying to a person who sent you an email is very easy. Instead of creating a new message from scratch, simply open or highlight the message in the list of messages in your inbox then click on the **REPLY** button.

A new message will be created with any extra text to be added. A copy of the original message you are replying to is usually included at the end of the new message.

Attachments

Files can be attached to email messages very easily. A paperclip icon is commonly used in most email programs.

All you have to do to send an attachment is to create a message as usual with the address, subject and message, then click on the **ATTACH** button. A window will open similar to the normal **OPEN FILE** window. Select the file that is to be attached and click on **OK** or **OPEN**. This will attach the file to the email. Just send it as normal.

When the recipient receives the message, they can open the attached file or save it. But remember: the person you send the file to must also have the same software in which the file was created in order to open it.

Checklist for writing email

1 Check you have entered the email address correctly.
2 Make the most of the subject line – it will encourage the recipient to open and read the message and also make it easier to find again.
3 Limit topics to one subject per email.
4 Keep the message brief and to the point while ensuring the meaning of your message is clear.
5 Do not use all uppercase when typing – it is difficult to read and is known as ‘shouting’, as it appears that’s what you are doing.
6 Avoid long paragraphs – use white space to make the message easier to read.
7 Always read the message before sending to check for errors in spelling, punctuation and grammar.
8 Include your name, organisation and contact details.
9 Do not spam – mass emailing for the purpose of advertising. This is illegal in Australia.
10 When attaching files, check that the recipient’s bandwidth will accommodate the size of the file.
11 Do not forward on chain mail.

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INTERNET PROJECT

You are to use the internet to find out information on a favourite topic and also find some sites that are a good source of information for your topic, and then write a short report.

Collecting the data

Pick a topic to research from the following list or choose one of your own (but check with your teacher first to make sure it is suitable):

- a sport you enjoy
- type of pet
- type of animal
- sports person
- movie you like
- holiday destination
- an event.

Defining the solution

- Use three different search engines to find some relevant sites.
- Look up at least 15 of the sites from the results of the searches (i.e. five sites from each search engine).
- Save a reference to each site in Favorites or Bookmarks.
- Decide on four sites you think are best.

Implementing

Make a list of the four best sites in a word processor file (such as Word) and why you like each of them. Note: If you are unable to use a word processor, you can list them in the email message in the next step instead.

Evaluating, collaborating and managing

1. Create a new message to two people in your class asking them to look up the sites contained in the attached file.
2. Attach the file that contains the list of sites.
3. Send the message to two people in the class and your teacher.

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Module 2

SOCIAL AND ETHICAL PRACTICE IN IT

ISBN 978-1-316-62393-0

Teacher information

IT knowledge and skills covered in this module

- The social impacts of digital technology
- Ethical use of digital technology
- Cyberbullying
- Tips for digital health and safety
- Intellectual property

Alignment with the Australian Curriculum

ICT Capability elements covered

- Applying social and ethical protocols and practices when using ICT
  - > recognise intellectual property
  - > apply digital information security practices
  - > apply personal security protocols
  - > identify the impacts of ICT in society
- Investigating with ICT
  - > define and plan information searches
- Creating with ICT
- Communicating with ICT
  - > collaborate, share and exchange
  - > understand computer mediated communications
- Managing and operating ICT

Other general capabilities covered

- Critical and creative thinking
- Personal and social capability
- Ethical understanding

Digital Technologies curriculum content in this module

Knowledge and understanding

- **Digital systems** – Investigate how data is transmitted and secured in wired, wireless and mobile networks, and how the specifications affect performance (ACTDIK023)

Processes and production skills

- Acquire data from a range of sources and evaluate authenticity, accuracy and timeliness (ACTDIP025)
- Define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints (ACTDIP027)
- Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032)

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2.1 Ethical use of computers

A computer is a powerful tool. The ever-increasing use and abilities of computers has a huge impact on home, school and work life. This impact can range from positive to negative depending on your circumstances and how you conduct yourself while using a computer. As a member of society you have a responsibility to yourself and to others to use computers in an **ethical** manner that maintains the safety and integrity of you personally, your information, and property and that of all others, not just people you know. You have the power to choose how you conduct yourself. Choose to be a good digital citizen.

ethical
Moral principles – also known as right or wrong behaviour.

Social and ethical practice in IT exercise 1

Thinking about our digital footprints.

The Australian Government's Office of the Children's eSafety Commissioner website has a great campaign to teach young Australians about being cyber safe. This is called *Be Deadly Online*, which is an animation and poster campaign about big issues online, like bullying and respect for others. The campaign has been developed with Indigenous writers and voice actors, and is suitable for all Australian students.

1 Open your browser.
2 On the Office of the Children's eSafety Commissioner website, YouTube or Vimeo, search for the "Dumb Stuff" video, written by Danielle Maclean. Please note: this video contains very minor coarse language.
3 Reflect on the video's message. What does "Dumb Stuff" say about our digital footprints?
4 Draw a poster explaining how you use digital technology in your daily life, and how your family and friends also use it. Explain in the poster:
   a What is a digital footprint?
   b How do you positively engage with digital technology?

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2.2 How the digital age impacts society

Computers are now part of most people's everyday lives in Australia and other westernised countries. Access to the internet is also commonplace. There are many advantages and disadvantages of using the internet. Can you add to the list that follows?

Advantages and disadvantages of the internet

Advantages of using the internet:

- It provides people with membership to a worldwide library and resource centre.
- It allows greater communication between all people throughout the world and breaks down geographical and cultural boundaries. For example, **Voice over Internet Protocol (VoIP)**, such as Skype, allows more people to stay in touch than ever before.
- It is changing the workplace environment by allowing people to work from home and in remote locations.
- Worker productivity in some job types has increased due to the use of computers.
- It provides education, health and commercial services to people anywhere in the world.
- It allows people who are otherwise isolated from society for whatever reason to socially interact.
- It provides entertainment and information for millions of people.

Voice over Internet Protocol (VoIP)
A technology that allows you to make voice calls using a broadband internet connection instead of a regular phone line.

Disadvantages of using the internet:

- It can isolate people from direct social interaction.
- It promotes the spread of computer viruses and other malicious applications.
- No controlling body verifies the validity of information or restricts illicit material.
- Because knowledge is power, it extends the division between the privileged and the underprivileged.
- It enables opportunities for fraud.
- The security of information belonging to individuals, businesses or governments may be jeopardised.
- Some people's jobs are replaced by computers.

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Advantages and disadvantages of computer use

Today, computers are tightly wound into the fabric of our society. Smartphones in particular have revolutionised how people interact with each other. Advancements in technology have affected the workplace and job opportunities.

Advantages of computer use:

- New ways to communicate personally – social media, smartphones.
- Text-based computer communication opens a world of opportunities to those with physical or social problems.
- Technology automates manufacturing to provide goods at a cheaper price.
- Technology assists in medical research and creativity.
- New industries develop based on evolving computerisation increasing job opportunities.
- Games and educational tools are more sophisticated and fun to use.
- New technology means computers are far more portable than before.

Disadvantages of computer use:

- Communicating via smartphone interferes with personal communication face to face.
- Gaming addiction can be a real problem, interfering with other normal parts of life.
- Portability of computers enables them to encroach in areas where they wouldn't normally be and so interfere with other parts of life.
- New technology in some industries reduces the workforce required, resulting in job losses.
- Money is invested in technology rather than people.
- Older people sometimes feel alienated in the workplace because of their lack of computer skills.

Social and ethical practice in IT exercise 2

Advantages and disadvantages of the computer and internet use

1. Add two points to the lists for advantages and disadvantages of the internet.
2. Add two points to the lists for advantages and disadvantages of computer use.
3. For each list, including your new points, what is the most important point for you?
4. Can you predict some job types that might be replaced by technology in the near future?

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2.3 Cyber health and safety

Using the internet and smartphones can be lots of fun. You can chat with your friends, post photos and look at photos others have posted. You can keep up to date with friends that live anywhere in the world. You can also play games online and look up lots of websites in areas of interest. While this is good, if you are not aware of how you are using these features there are two factors that can be seriously affected – your health and your safety.

Though it can be fun, it is also very easy to spend a lot of time in front of the computer or using your phone. It is easy to get hooked and spend too much time doing this. The time you spend means you have less time for other things that should also be important in your life. Remember – not everything in your life might be as fun as playing with your computer or phone, but certain other activities are very important for your development. You also need to spend time:

- face to face with family and friends
- on hobbies such as reading books, playing sport, playing a musical instrument, getting out and about
- helping around the house
- doing homework if you have it
- sleeping – everyone needs adequate sleep to function properly.

You can control how much time you spend on the internet, on the phone or doing any of the other things in life you could be doing. Be aware of the time and what you are doing.

Social and ethical practice in IT exercise 3

Cyber health

1 Keep a diary for a week that records what you do and how long you spend doing it. Be honest – include things like travelling to school, watching TV, reading, playing sport, shopping, doing homework, housework and so on. For time spent on the internet, divide it into:
   - **a** Socialising on sites like Facebook, Twitter and Instagram.
   - **b** Research for schoolwork.
   - **c** General interest surfing (e.g. the sports pages of a newspaper site).
   - **d** Playing games.
2 Did you do all your homework?
3 Did you do the tasks you are supposed to around the house?
4 Write a list of things you would like to do, if you had the time.
5 Look at the time you spend on the internet or talking on the phone. What else could you do during this time?
6 What do you think is a reasonable amount of time to spend on the internet each day?

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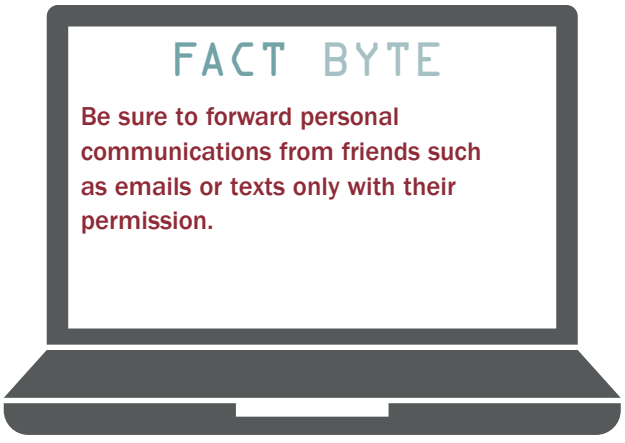
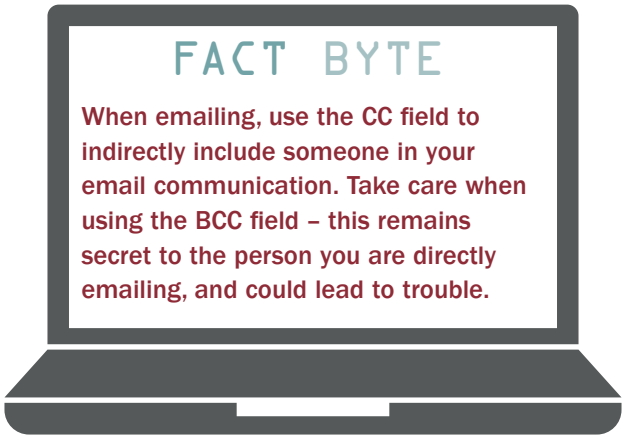
Being cybersmart to stay safe

It would be nice to think that all people can be trusted. The sad fact is that there are many people online purposely trying to trick you and others so they can get something from you or hurt you in some way. These may be people you know or people you don't know. The people you don't know can come from anywhere – next door, the next town or suburb, even the other side of the world. You can control the effect these people have on you by being aware of what you are doing when you are on the internet or phone, and by being aware of what is going on around you.

Cyber safety checklist

- Keep your details and those of your friends and family private. Always check with your parents or an adult before giving out any personal details.
- It can be a lot of fun making new friends online. Keep in mind that all is not always what it seems. That 14-year-old girl may in fact be a much older person, and possibly male.
- You may make new friends online. If you want to meet them, always go with a parent or adult friend to a busy public place to start with. The person you think you are friends with may in fact be someone quite different, even dangerous.
- Never give your passwords to anyone, not even your friends (but you should provide them to your parents or caregivers for safekeeping).
- If you feel uncomfortable about something you see on the net or that is sent to you, leave the page or the chat room, or don't respond to the message or email. Make sure you tell an adult about it.
- Sites may expect you to fill out forms and include personal details before they enable you to download free items, or register an email address. You should always give the minimum amount of information possible and check with a parent or adult first.
- People may offer you things that seem fantastic and you feel very lucky. These offers will most likely be bogus – another ploy to get information from you that they can use to your detriment or it may be an avenue to install malicious software onto your computer. If it seems too good to be true, it probably is.
- If you have a webpage or blog, be very careful about the information you put on it. You may think only your friends are reading it, but in reality you may have a much wider audience – it is easy to forget and place personal information online. You should also be careful about the photos you upload – think about who may be looking at them. You should also be considerate of other people's privacy (e.g. don't load photos of other people without their consent).
- Treat other people as you yourself would like to be treated. Only send the types of messages you would like to receive. Don't write things you would not like other people to write about you.
- Especially when using social media, be mindful of its global nature. There can be big differences in both time zones and the meaning of terms and concepts for people in different locations and cultures.
- Tell someone if you or someone you know is being treated badly.





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Cyber safety sites

There are lots of interesting sites that can help you more with learning how to keep yourself and others safe on the internet, such as:

> #GameOn: provided by the Office of the Children's eSafety Commissioner, #GameOn provides information, advice and stories to help you use the internet safely. It features five short cybersafety videos that follow the online experiences of a group of lower secondary students who find themselves in situations that catch them off-guard and teach them the consequences of making poor decisions online. Topics include cyberbullying, excessive gaming, sharing passwords, free downloads and online friends.

2.4 Netiquette – internet etiquette

Netiquette is a new-age term for etiquette on the internet. Netiquette focuses on how people should behave when using the various services on the internet. For example, YOU SHOULD AVOID USING UPPERCASE WHEN TYPING MESSAGES. This is known as shouting.

When using social media or a chat room, you could be talking to anyone in any country. It is inevitable at some stage that you will not agree with some of the ideas or statements presented. There are many excellent sites that provide detailed guidelines on how to behave when communicating with others on the internet:

1. Type in the address for Yahoo! in the address box.
2. Type `netiquette` in the search box and press `<enter>`. This should give you a decent list of sites.
3. Now try it in Google. Type in the address for Google Australia in the address box, and then type `netiquette` in the seach box and press `<enter>`. You should get a very decent list of pages.
4. Click on the links to some of the sites to learn more about netiquette.

Social and ethical practice in IT exercise 4

Netiquette

In this exercise you will create a short report on the results of your searches about netiquette. You may need to repeat the searches.

1. Start a new document in Microsoft Word or a similar word processor.
2. Enter a title for your report and save it as: Netiquette search report.
3. Write a brief introduction that states what netiquette is.
4. Name two search engines you could use to search for sites about netiquette.
5. Conduct a search using each search engine. List the top five sites displayed for each search in your report. How many sites did your search find in one of the searches?
6. After looking at each of the sites, create your own list of rules – you should be able to list at least eight rules – some for emails and some for newsgroups (some may overlap).
7. Find out the guidelines set down at your school for communicating on the internet and compare them to your own list. Are there any other rules you would add to your own list? If there are, add them to your list.
8. Enter your name and the date at the end of the report.
9. Run a spell check, save and close your document.
10. If required, print your report out and submit it to your teacher for checking.

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2.5 Cyberbullying

Smartphones and emails enable bullies to silently bully and harass others. If this is happening to you, do the following:

1. Tell an adult that you trust about what is happening so they can help.
2. Tell a friend or classmate so they can give you emotional support.
3. Block the bully from your phone or emails.
4. Keep evidence of what is happening – take pictures of texts on your phone or keep emails. You could also make notes in a diary that records dates and times and what is said.
5. If it happening via a particular site (such as social media or through online gaming) then report the person.

Social and ethical practice in IT exercise 5

Play the Digizen game – are you a responsible digital citizen?

This game is developed by Childnet International. You spend a day with Joe at school and make choices about how to help him as he experiences cyberbullying.

1. Open your browser.
2. Look up the Digizen site in the address box and press <Enter>.
3. Move through the game and make decisions about what to do.

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2.6 Intellectual property

Further to keeping your information secure, as well as that of others, is respecting other people's intellectual property. Think, for instance, about the distinctive colour purple for Cadbury chocolate wrappers. Cadbury came up with this and it is now protected – no other company selling chocolate can use the same shade of purple.

Similarly, we all know the word 'Google'. But what we may not know is that it is a play on the word 'googol', a mathematical term for the number 1 followed by 100 zeros. The company founders came up with this name in their garage workspace in the early inception of Google and the word is now trademarked. In fact, it is the most valuable trademark today. The Microsoft trademark is not far behind.

Overall, companies need to know what may or may not be copied, and check for permissions and legal obligations before creating new products.

Copyright is another aspect of intellectual property that is commonly breached. If you download music or movies from any organisation other than an authorised distributor, you are breaching copyright. You are also breaching copyright if you then make this available to others by streaming it or making copies and distributing it. This is called piracy.

Intellectual property copyright also extends to your friends and classmates. Files they have created belong to them. You should not copy them or parts of them and pretend they are your own work. Instead, you must name the sources you borrowed from, and at all costs avoid committing **plagiarism**.

plagiarism
A serious type of copying where someone claims that another's work is their own.

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iTunes is an example of a legal distributor where you can download various types of media – music, movies, books – for a small fee. One day you may be a creator of this type of work and you will surely want to be paid for the time, effort and money you spend on creating your work.

The social impact of piracy is a reduction in production and jobs. There are many blockbusters that make millions of dollars. This money is used to create films that are not always successful. To encourage a diverse range of topics and film genres requires the funding from the mainstream films. If the movie industry dies, entertainment is reduced; people who work in that industry and associated support industries are out of work.

You are also putting yourself at risk when you download illegal files. Often these files will have malicious software attached that may harm your computer or steal information without you even knowing. Module 1 covered keeping your computer up to date with anti-malicious software. Following these steps is also known as **ethical protocols**.

ethical protocols
Generally accepted rules or behaviours when undertaking research and collecting and using information from primary and secondary sources (e.g. confidentiality, informed consent, citation and integrity of data).

Childnet International has a range of resources in an effort to provide information and advice on using chat rooms, mobile phones, email, SMS and games safely. Stories and quizzes are also provided. It is bright and easy to use. You may have younger siblings or friends who would also benefit from looking through the information here.

Social and ethical practice in IT exercise 6

Intellectual property

1 Look up Childnet International: Secondary in the address box of your browser.
2 Scroll down and click on 'Hot topics'.
3 Click on the topic 'Downloading' and read through the information.
4 Can you think of a time when you have copied something that you should not have?

Maintain your digital security

Your password is yours and yours alone. Do not give it to anyone else (other than parents). Why would anyone need your password? Any number of excuses may be used, but be aware. Providing your password provides that person with access to all your files or memberships to games and other sites. They can pretend to be you, copy or delete your files. (Module 1 covered using passwords and other means of access to your computer.)

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SOCIAL AND ETHICAL PRACTICE IN IT PROJECT

You are to create a story that is an example to others on how to conduct themselves ethically and responsibly in a situation. Depending on the tools you have at your disposal, you could create a video based on recordings of you and your classmates – if necessary, role playing. Or you could create the video using illustrations. For either of these, Module 5: Making movies can help you. Or you could hand draw a series of scenes as in a comic strip or use an online illustration tool.

Collecting the data

Decide on what the topic will be. You should discuss this with your teacher. For example, it could be:

> What to do if you are being cyberbullied.
> Protecting your personal information.
> What is intellectual property.

What are the main points you want to convey? For examples and inspiration you could watch some of the short videos on the Australian Government's eSafety Office Vimeo page.

Defining the solution

> Create an outline of the message to be conveyed in the video or comic strip. Will you have just one person or will there be two or more people in the story?
> Design the scenes or scene of the story. Check that you have included everything necessary. Is your message clear?

Implementing

Record the scenes based on your script or draw them.

Evaluating, collaborating and managing

1. Look at the result of your work. Has it worked as you had planned? Can you improve it in any way?
2. Ask your friends and classmates to look at your video or comic strip and to give you feedback.

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Module 3

WORD PROCESSING

Programs featured for exercises:

Microsoft Word

Google Docs

ISBN 978-1-316-62393-0

Teacher information

IT knowledge and skills covered in this module

- Creating a document and entering text
- Editing and formatting text
- Copying and pasting
- Page breaks and layouts
- Using tables and inserting graphics
- Multi-page documents

Suggested further uses across the curriculum

- English (for writing book reviews). Use a range of software, including word processing programs, to confidently create, edit and publish written and multimodal texts (ACELY1728, ACELY17); (ACELY1725).
- History (for writing essays). Use a range of communication forms (oral, graphic, written) and digital technologies (ACHHS214).
- Science (for writing up research reports). Communicate ideas, findings and evidence-based solutions to problems using scientific language; and representations, using digital technologies as appropriate (ACSIS148).

Alignment with the Australian Curriculum

ICT Capability elements covered

- Creating with ICT
- Communicating with ICT
  - collaborate, share and exchange
- Managing and operating ICT

Other general capabilities covered

- Literacy
- Numeracy
- Critical and creative thinking
- Personal and social capability

Digital Technologies curriculum content in this module

Processes and production skills

- Analyse and visualise data using a range of software to create information, and use structured data to model objects or events (ACTDIP026)
- Design the user experience of a digital system, generating, evaluating and communicating alternative designs (ACTDIP028)
- Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032)

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3.1 What is word processing?

Word processing is where you use a computer to enter text, make changes to it, record and print it. There are many word processing programs available. The most common ones are: Microsoft Word and Google Docs.

You use a word processing program to produce professional business letters, reports, poems, song lyrics, job applications, personal resumes, CVs, essays and class projects. A word processor is used anywhere that handwriting could have been used.

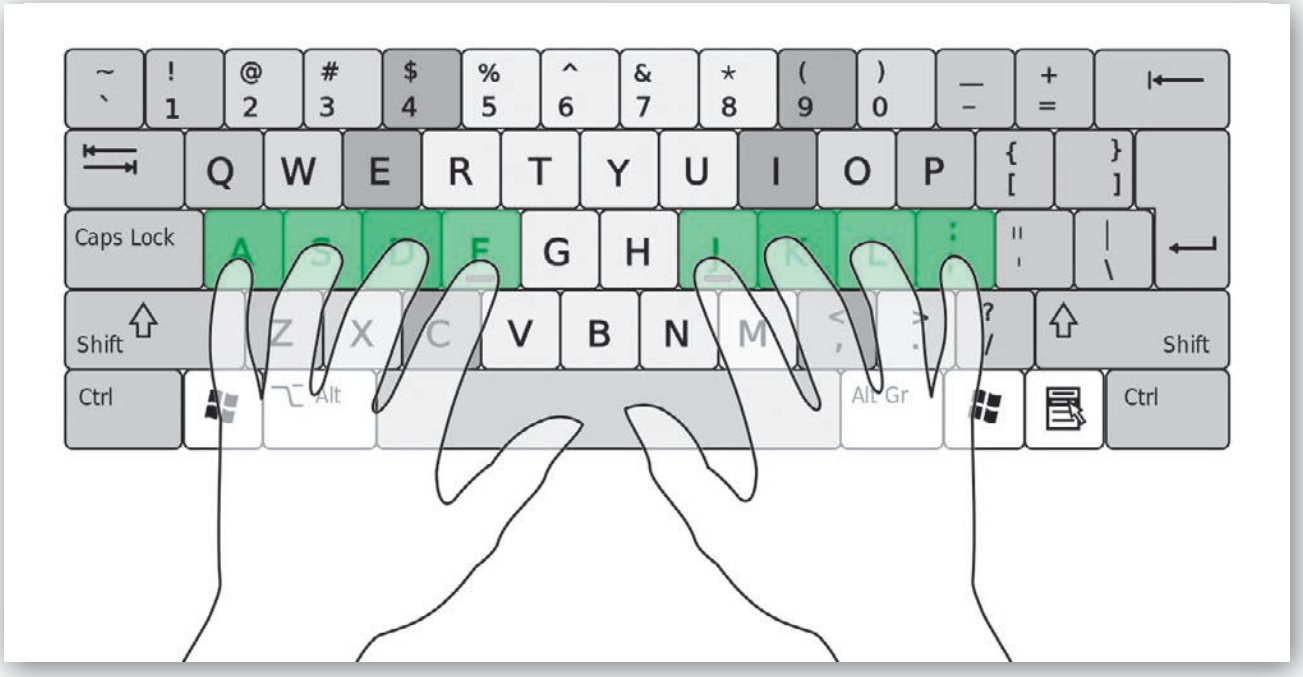
3.2 Keyboard technique

In order to use word processing packages efficiently, you should try to develop a good keyboard technique. This means using the correct fingers on the keyboard. There are free online training programs to practise your typing technique or your school may have programs for you to use.

Keys

The home keys

Always start with your fingers on the home keys. Most keyboards have markers or raised dots on the <F> and <J> keys. These are included so that you can feel where to place the index finger of each hand without needing to look at the keyboard.



Your left index finger is placed on the <F> key with the other three fingers on the keys to the left of it, on the <D>, <S> and <A> keys.

Your right index finger is placed on the <J> key with the other three fingers on the keys to the right of it, on the <K>, <L> and <;> keys.

The other keys

When you need to use the other keys, move the closest finger either up or down. The left index finger can be used to press the <G> key and the right index finger can be used to press the <H> key.

Your thumbs are used to press the <space bar>.

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Special keys

Three special keys that are used with word processed documents are the <Shift> key, the <Caps Lock> key and the <Enter> key.

When entering a document, the text should be set to lowercase (small letters) with the <Caps Lock> key set to off. When you need to set a letter to uppercase (capital letters), such as at the beginning of a sentence or for the name of a place or person, hold down the <Shift> key and press the letter.

If you need to type a heading in uppercase, turn the <Caps Lock> key on to type the word or words then turn the <Caps Lock> key back off for the rest of the text. The <Enter> key is only used at the end of a paragraph, the end of a heading or to leave a blank line.

Correct posture

To reduce tiredness and place less stress on your arms and back, it is important to be seated correctly in front of the computer screen:

- your body should be in line with the centre of the computer screen
- your eyes should be level with the computer screen
- your feet should be flat on the floor.

3.3 Entering a document

When entering a document, all the words should be entered first in plain text. Once all the text has been entered, corrections and formatting can be conducted.

As noted, the <Enter> key is only pressed to:

- complete a paragraph
- complete a heading
- leave a blank line.

The <Enter> key should not be pressed to end a line within a paragraph. The word processing program takes any words that don't fit at the end of the line to the next line. This process is called **word wrap**.

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Word processing exercise 1

Revision – Entering a document

Skills practised
- Entering text
- Editing
- Using the Enter key
- Paragraph setting
- Spell checking
- Using the Caps Lock key

Enter the business letter shown below. To do this efficiently, you should use the following steps:

1 Enter all the text first without any formats.

2 Have the <Caps Lock> key set to off and hold down the <Shift> key and type the letter when you need a capital letter.

3 Press the <Enter> key only when indicated.

Note: In Microsoft Word the **NO SPACE** style can be selected from the ribbon to set the line spacing to zero.

25 March 2018	<enter>
	press <enter> 4 times
Mrs Leanne Forrest	<enter>
202 Hyatt Street	<enter>
Ballina, NSW, 2478	<enter>
	<enter>
Dear Leanne	<enter>
	<enter>
I congratulate you on winning first price in our national raffle. You are now the proud owner of a BMW 320i Automatic Sedan valued at $68,170. This includes all on-road costs.	<enter>
	<enter>
We would like to invite you to our office at 66 Jules Court, Castle Hill, 2154 on 1 April, 2018 so that the presentation of the car can be made to you. Please feel free to bring your family members with you.	<enter>
	<enter>
Yours sincerely	<enter>
	press <enter> 4 times
Shaun O'Farrell	<enter>
Hearing Research Centre	<enter>

4 Once complete, save the document under an appropriate name, such as: WP Exercise 1.

5 Spell check the document using the **REFERENCES** tab or **TOOLS** menu then **PRINT PREVIEW** it using the **FILE** tab – **PRINT** or the **FILE** menu – **PRINT PREVIEW**.

6 Carefully read through the preview and correct any errors. If you have difficulty proofreading from the screen, print a copy, mark any errors with a pen then correct the errors on the screen.

7 After the corrections have been made to the document, resave it by pressing <Ctrl+S> or <Command+S> and print a final copy or share your work electronically.

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3.4 Formatting text

Text can be set to a variety of appearances. The process of altering the appearance of text is called formatting. You can set text to **bold**, *italic* or underline when you need text to stand out.

The best time to format text is after you have finished entering it (typed it in). To format text, highlight the word or section of text, then click the appropriate button in the ribbon or toolbar (such as `<Ctrl+I>` for italic).

If you format text as you enter it, you have to keep turning the formatting on and off as you go, which can slow you down and may create many errors. It is more logical and efficient to type the text in first, then carry out the formatting second.

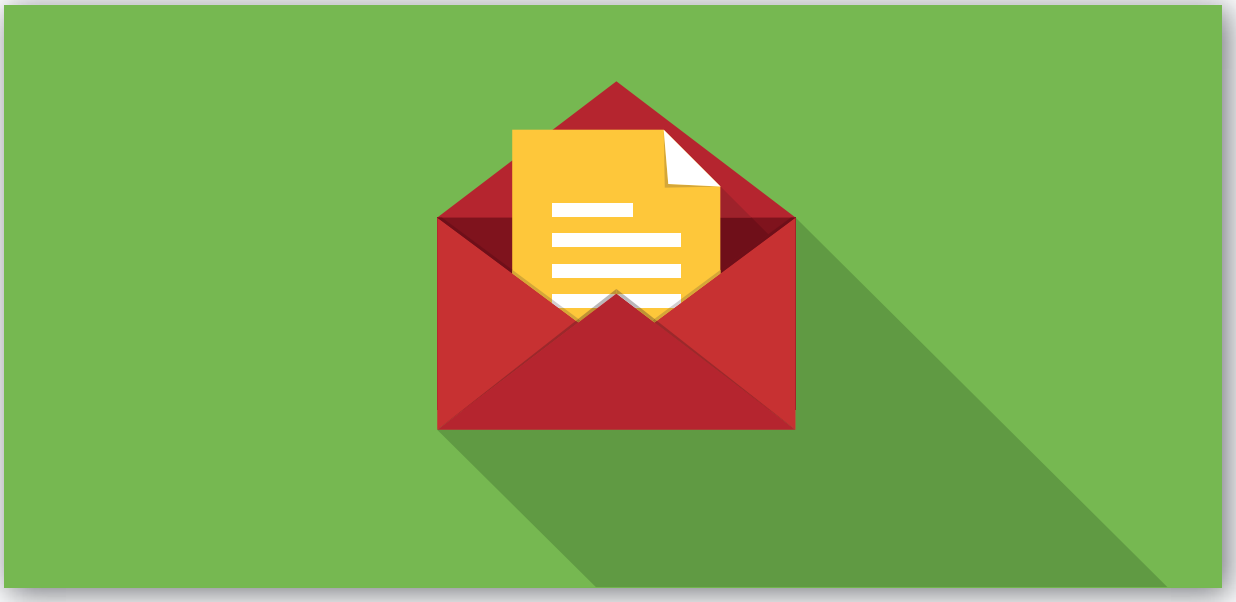
Word processing exercise 2

Formatting text

Skills practised
- Adding a heading
- Editing text
- Formatting text

1 Load your letter from the previous exercise (if it is not already open) in order to add some text and formats to it.
2 Position the cursor at the beginning of the first line (just before the 2 in 25 March 2018).
3 Enter the heading 'Hearing Research Centre'.
4 Press the Enter key five times: once to complete the heading and the other four times to leave four blank lines.
5 Highlight all of the heading and use the **HOME** tab or **TOOLBAR** to set:
   > the **FONT** to **CAMBRIA** or **TIMES NEW ROMAN**
   > the **FONT SIZE** to 18 point
   > the **FONT STYLE** to **BOLD**, **COLOUR** and **SHADOW** (if available)
   > the **ALIGNMENT** to **CENTRE**.
6 Highlight the following and set their format to **ITALIC:** BMW 320i Automatic Sedan.
7 Highlight the price $68,170 and set its format to **BOLD**.

Your letter should look like the one displayed on the next page.



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HEARING RESEARCH CENTRE

25 March 2018

Mrs Leanne Forrest
202 Hyatt Street
Ballina, NSW, 2478

Dear Leanne

I congratulate you on winning first price in our national raffle. You are now the proud owner of a *BMW 320i Automatic Sedan* valued at **$68,170**. This includes all on road costs.

We would like to invite you to our office at 66 Jules Court, Castle Hill, 2154 on 1 April, 2018 so that the presentation of the car can be made to you. Please feel free to bring your family members with you.

Yours sincerely

Shaun O'Farrell
Hearing Research Centre

8 **SAVE** the document on your storage disk or in your storage folder.

9 Spell check the document then **PRINT PREVIEW** it.

10 Carefully read through the preview and correct any errors. If you have difficulty proofreading from the screen, print a copy and mark any errors with a pen then correct the errors on the screen.

11 After the corrections have been made to the document, resave it by pressing <Ctrl+S> or <Command+S> and print a final copy or share your work electronically.

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3.5 Copying and pasting text

You can copy text and paste it to other sections of a document. This saves you the effort of re-entering text. When you wish to simply move text you can **CUT** it from the screen and **PASTE** it at the required position.

To see an example of copying and pasting, you will be entering the song lyrics from the theme song of the film *Fly Away Home*. The song has a chorus, which should only be entered once.

Word processing exercise 3

Copying and pasting text

Skills practised
- Entering text
- Editing text
- Copying and pasting
- Formatting text

Enter the song lyrics shown below. To do this efficiently you should follow these steps:

1. Enter all the text first without any formats.
2. Press <Enter> at the end of each line; leave two lines after the heading and before the songwriter's name.
3. Format the heading after all the text has been entered to be **BOLD**, a **COLOUR** and **SHADOW** (if available) and to a larger **FONT** size.
4. Highlight the Chorus heading and set it to **ITALIC**.

10,000 Miles

Farewell my own true love.
Farewell for a while.
I'm going away, but I'll be back
Though I go 10,000 miles.

Chorus
10,000 miles, my own true love
10,000 miles or more.
The rocks may melt and the seas may burn
If I should not return.

Will you come back my own true love
And stay a while with me.
If I had a friend on this earth
You've been a friend to me.

Traditional

5. Highlight the chorus, including its heading, and press <Ctrl+C> or <Command+C> to **COPY** it.
6. Set the cursor at the blank line just above 'Traditional' and **PASTE** the chorus by pressing <Ctrl+V> or <Command+V>.
7. Press <Enter> to leave an extra blank line before the word 'Traditional'.
8. Save the document on your storage disk or in your storage folder.
9. Spell check the document then Print Preview it.
10. Carefully read through the preview, correct any errors, resave the document and print a final copy or share your work electronically.

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3.6 Inserting page breaks and moving text

Many documents you create have more than one page. You need to be able to format those pages. This includes setting page breaks, which finishes the page and takes the cursor to the top of the next page, and adding page numbers, which places the number of the page at the bottom of the page. You can even copy text from one page to another.

In the next exercise you will adjust the song lyrics you entered in the last exercise by copying them to a second page, inserting page numbers and moving text in the copied version of the song.

Word processing exercise 4

Inserting page breaks and moving text

Skills practised
- Editing text
- Copying and pasting
- Inserting page breaks
- Inserting page numbers
- Using Find and Replace

1. Load the song lyrics from Exercise 3.
2. Highlight the whole song by choosing **SELECT** from the ribbon or **EDIT** menu (you can press <Ctrl+A> or <Command+A>) and copy it.
3. Place the cursor at the end of the document (after 'Traditional') and insert a **PAGE BREAK**. The option is in the **INSERT** tab or **INSERT** menu.
4. **PASTE** the song onto the second page.
5. From the **INSERT** tab or **INSERT** menu, insert **PAGE NUMBERS** to be at the bottom centre of each page.
6. In Microsoft Word the **CLOSE** icon can be used to close the header and footer screen.
7. In Google Docs, click on the menu to close the header and footer pane.
8. Highlight the first verse and **CUT** it from the screen.
9. Set the cursor at the beginning of the second verse and **PASTE** the first verse.
10. Repeat step 8 to place the second verse where the first was. The song on the second page should look like the one shown below.

10,000 Miles

Oh come ye back my own true love
And stay a while with me.
If I had a friend all on this earth
You've been a friend to me.

Chorus
10,000 miles, my own true love
10,000 miles or more.
The rocks may melt and the seas may burn
If I should not return.

Fare thee well my own true love.
Farewell for a while.
I'm going away, but I'll be back
Though I go 10,000 miles.

Chorus
10,000 miles, my own true love
10,000 miles or more.
The rocks may melt and the seas may burn
If I should not return.

Traditional

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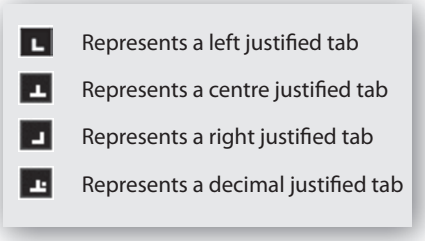
11 Use **SAVE AS** from the **FILE** tab or **FILE** menu to save the document under a different name from the one you used in the last exercise.
12 Check over the document and make any adjustments.
13 Use **FIND AND REPLACE** from the **HOME** tab or **EDIT** menu to change all the occurrences of the word 'rocks' with 'cliffs' in the copy on the second page only.
14 Print a final copy of your two pages or share your work electronically.

3.7 Tab stops

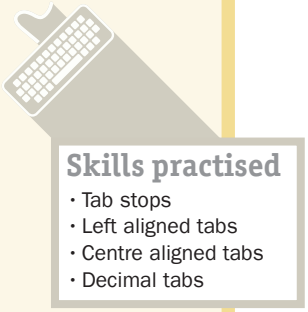
When you need to align text within a document, **TAB** stops must be set. The space bar should never be used, as the text will not print straight because not all the letters are of equal width.

Tab stops can be set in the program's Ruler. When you press the **TAB** key, the cursor will jump to the set tab stop. These set tab stops can be adjusted using the **TAB** box at the left of the top ruler and any text set to them will be adjusted as well. There are four different types of tab stops that align the text to the **LEFT**, **RIGHT**, **CENTRE** or to **DECIMAL** points.



Word processing exercise 5

Tab stops



Follow these steps to enter the table shown below:

1 The main heading should be bold and 14 pt.
2 For the subheadings, **CENTRE JUSTIFIED TAB STOPS** are needed for the second and third subheadings. In Microsoft Word, set the **TAB** box at the left of the top ruler to the centre tab option then click in the Ruler. For Google Docs, click on the Ruler and select **ADD CENTRE TAB-STOPS**.
3 The numbers in the table need to be aligned. In Microsoft Word, set **DECIMAL TAB STOPS** in line with the headings. In Google Docs, set **RIGHT TAB-STOPS** in line with the headings.

Album Sales, 2016

Performer	Albums Sold (millions)	Royalties ($millions)
Katy Perry	6.62	14.75
Taylor Swift	10.42	25.83
Ed Sheeran	8.30	19.02
Beyoncé	4.26	9.13

4 Once complete, save the document.
5 Check over the document and make any adjustments. Resave the table if you made any changes.
6 Print a copy of the document or share your work electronically.

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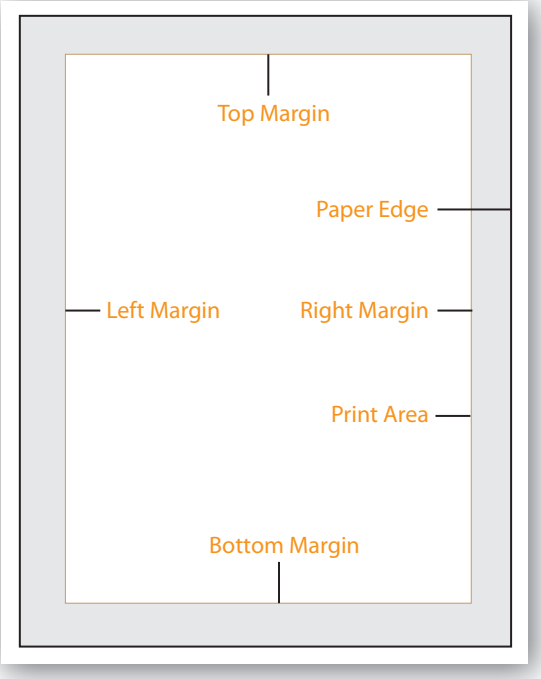
3.8 Page margins and indents

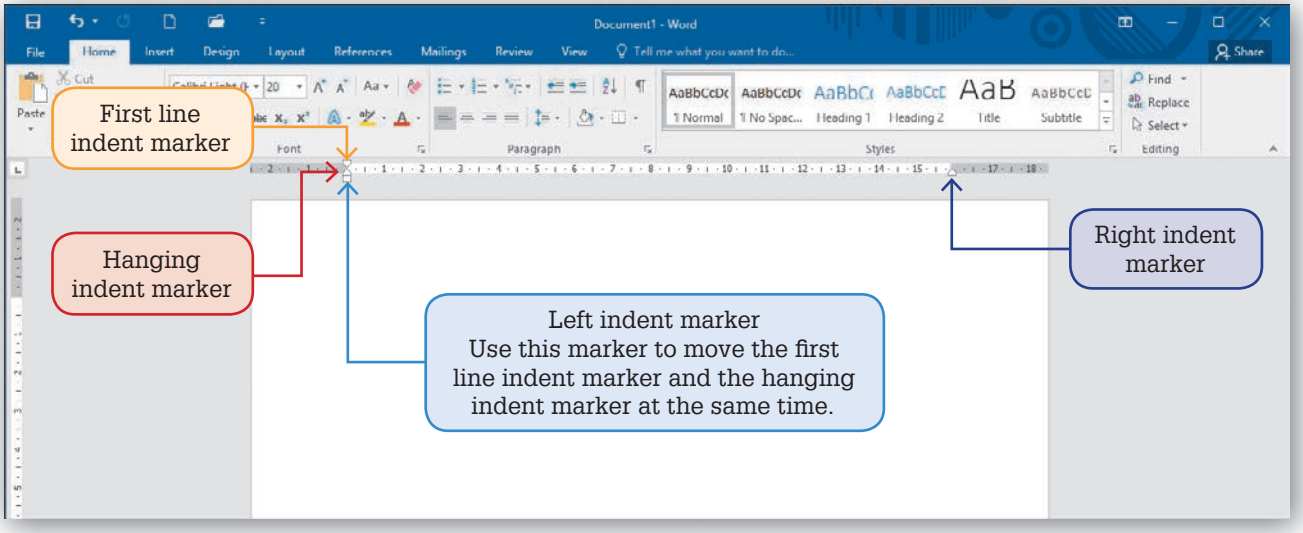
Page margins

Page margins are the spaces between the edge of the paper and where your text is printed. They allow you to control where your text is printed on a page. All printers require a certain amount of space from the edge of the paper to where the printing starts and documents would not look very professional if they started very close to the edge of the paper. The diagram to the right shows the position of the page margins.



Setting page margins

When you need to adjust the width of paragraphs within a page, the indent markers in the ruler are used. The indent markers are the solid triangles at both ends of the ruler. The following diagram indicates what the markers represent.



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Word processing exercise 6

Setting page margins

Skills practised
- Setting page margins
- Setting indents

1 Use the **MARGINS** icon in the **PAGE LAYOUT** tab or use the Ruler markers to set the top and bottom margins to 3 cm each, and the left and right margins to 3.5 cm.

2 Enter the following document without any formatting or indenting.

MUSIC ONLINE

Music Online will be demonstrated at the 'Music World Wide' show which is to be held at Auckland's Superdrome from 29 November. The company aims to make purchasing music online easier than ever. This is the first time the highly successful exhibition has been held in New Zealand. Previous shows have been held in Adelaide, Melbourne, Sydney, Perth and Brisbane.

According to Exhibition Manager, Tania Harris:

> 'The exhibition in Auckland is shaping up to be an outstanding success. The involvement of Music Online will be a major boost.'

A report just completed by the Australian Retail Sales Association has concluded that:

> 'Downloading music from the internet is now the main way music is purchased in Australia and New Zealand.'

It is estimated that there are well in excess of 3 million Australians and New Zealanders who have purchased music in the past year through Music Online.

3 Once all the text has been entered, format the heading as bold, caps, larger and a colour.

4 Highlight the paragraph that starts 'The exhibition in Auckland …' and move its left indent marker in the Ruler to 1 cm and its right indent marker to 13 cm.

5 Repeat step 3 for the paragraph that starts 'Downloading music from the internet …'

6 Once complete, save the document.

7 Spell check the document then carefully proofread it.

8 Make the corrections to the document, resave it and print a copy or share your work electronically.

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3.9 Combining tabs and indents

Tab stops and indents can be used together in the production of documents. This can be very useful when you need to create hanging indents, which set indented text to be in line. For example, the instructions in this book use hanging indents.

Hanging indent

5 Highlight all of the text and set the font to Times New Roman, the font size to 18 pt and the style to bold.

Word processing exercise 7

Combining tabs and indents

Skills practised
- Formatting
- Using tab stops
- Using indents

Create the personality profile shown below. You can insert your own details if you prefer to.

1 You will need to set a **RIGHT JUSTIFIED** tab stop for the titles position.

2 For the responses position, in Microsoft Word, move the **HANGING INDENT** marker. In Google Docs, move the **LEFT INDENT** marker then move the **FIRST LINE INDENT** marker back to 0.

3 Carry out the formats once all the text has been entered.

PERSONALITY PROFILE

Name:	Julie Robinson
Celebrity Status:	Miss Universe, 2024
Date of Birth:	30 September, 2003
Brothers and Sisters:	2 (not counting Stuart)
Pets:	Cat called Scary
	Dog called Posh
Favourite Food:	Pizza with chips
Favourite Drink:	Lemon and lime with ginger ale
Favourite Group:	The Mice Girls
Favourite Car:	Lada
Likes:	Andy, movies, Andy, dancing, Andy, netball, Andy, shopping, Andy, football.
Dislikes:	Loud or self-centred people, Betty, Science, Betty, washing dishes, Betty.
Ambition:	To be rich and famous, married to Andy with 10 children, 2 cats, a dog and a canary.

4 Once complete, save the document, spell check it, check over it and print a copy or share your work electronically.

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3.10 Further tabs and indents

To practise the use of tab stops and indents you will produce the memo shown below. You will need to use the ruler carefully.

Word processing exercise 8

Further tabs and indents

Skills practised
- Formatting
- Using tab stops
- Using indents

1 For the Date to Subject section, set a **RIGHT JUSTIFIED TAB STOP** for the subheadings and, in Microsoft Word, move the **HANGING INDENT** marker for the responses. In Google Docs, move the **LEFT INDENT** marker then move the **FIRST LINE INDENT** marker back to 0.

2 For the paragraphs in Microsoft Word, move both the **LEFT INDENT** and **FIRST LINE INDENT** markers to the position where you want the left edges to start (in line with the responses). In Google Docs, move both the **LEFT INDENT** marker and **FIRST LINE INDENT** marker to the position where you want the left edges to start.

3 The company name should be centred, set to bold and the font size increased.

4 The address should be centred and the same font size as the rest of the document.

5 The subheadings **Date:**, **To:**, etc. need to be set to bold.

Sam's Pizza Palace
180 Gibson Street, Canterbury, NSW, 2193

Date: 14 October 2017

To: Sam Alterini
Title: Manager/Owner

From: Ronald O'Reilly
Title: Pizza Maker

Subject: The advertised position of waiter

I would like to apply for the recently advertised waiter position.

I have been making pizzas for you for seven years. This has given me extensive knowledge of our product line. I believe that I am well presented and I think it is time I had more contact with the public.

Could an interview be arranged at your convenience? Thank you for your consideration.

6 Once complete, save the document, spell check it then carefully proofread it.

7 Make the corrections to the document, resave it and print a copy or share your work electronically.

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3.11 Bulleted and numbered lists

An application of hanging indents is the use of bulleted or numbered lists. Most modern word processing programs have automated the process of creating these types of lists.

Word processing exercise 9

Bulleted and numbered lists

Skills practised
- Using bullets
- Formatting bullets
- Numbered lists

1 Enter the following text, pressing the <Enter> key where indicated:

COOKING TIPS <enter>
<enter>
Here are a few cooking tips that may be worth referring to when preparing the recipes in this book: <enter>
<enter>
Always try to cook vegetables by steaming. If you do not have a steamer, wrap the vegetable in foil and cook it in an oven <enter>
<enter>
Always clean vegetables before cooking. A nailbrush can be useful to clean vegetables that do not need the skin removed. <enter>
<enter>
Try not to over-cook food. A cooked vegetable should be firm, not hard or soft. A fish is cooked when its flesh is white and fine and can be broken easily. <enter>

2 Highlight the text from 'Always try to cook vegetables by steaming' to the end of the document.

3 Set the text to a bullet using the **BULLETED LIST** icon from the **HOME** tab or toolbar and the hanging indent should be automatically set.

4 Highlight the three bulleted points and change the format of the bullet to another symbol, such as a tick, using the **BULLETED LIST**. Refer to the diagram below as an example.

COOKING TIPS

Here are a few cooking tips that may be worth referring to when preparing the recipes in this book:

- ✔ Always try to cook vegetables by steaming. If you do not have a steamer, wrap the vegetable in foil and cook it in an oven.
- ✔ Always clean vegetables before cooking. A nailbrush can be useful to clean vegetables that do not need the skin removed.
- ✔ Try not to over-cook food. A cooked vegetable should be firm not hard or soft. A fish is cooked when its flesh is white and fine and can be broken easily.

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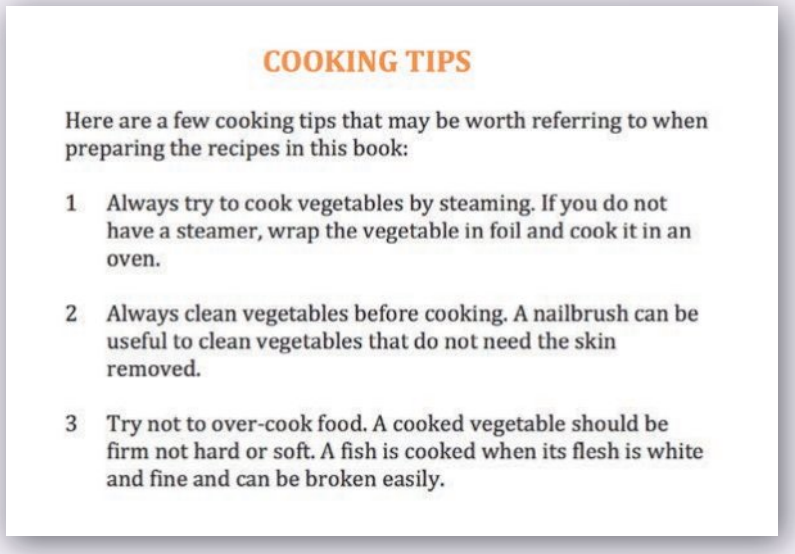
5 Highlight the three bulleted points and change the text to a numbered list using the **NUMBERED LIST** icon in the ribbon or toolbar. For example:



COOKING TIPS

Here are a few cooking tips that may be worth referring to when preparing the recipes in this book:

1 Always try to cook vegetables by steaming. If you do not have a steamer, wrap the vegetable in foil and cook it in an oven.

2 Always clean vegetables before cooking. A nailbrush can be useful to clean vegetables that do not need the skin removed.

3 Try not to over-cook food. A cooked vegetable should be firm not hard or soft. A fish is cooked when its flesh is white and fine and can be broken easily.

6 Save the document and print a copy or share your work electronically.

3.12 Leader characters

Leader characters fill the space before tab stops with dots, dashes or underlines. They are a neat way of underlining tables or aligning numbers to text in a contents page.

Word processing exercise 10

Leader characters

Create the contents page for a cookbook shown on the following page.

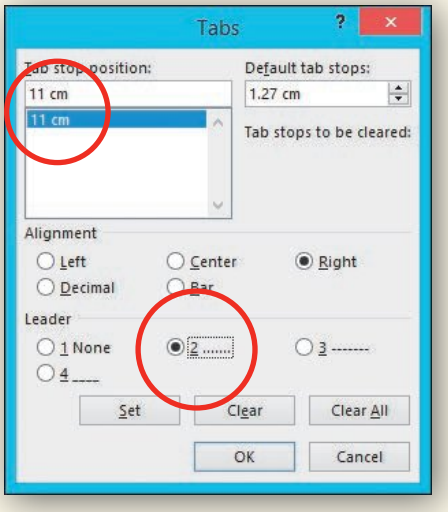
Skills practised
- Right-aligned tab stops
- Leader characters

1 Enter the text without formatting it.

2 For the contents set a **RIGHT JUSTIFIED TAB STOP** at the right of the Ruler.

3 In Microsoft Word, double click on the tab stop in the Ruler and, in the **TABS** dialogue box, click on the tab position, set the tab stop to have a dotted leader character and select **OK**. Google Docs does not have leader characters, but you can enter the dots manually up to the tab stop.

Note: The **RIGHT JUSTIFIED TAB STOP** ensures that the right edges of the page numbers are in line.



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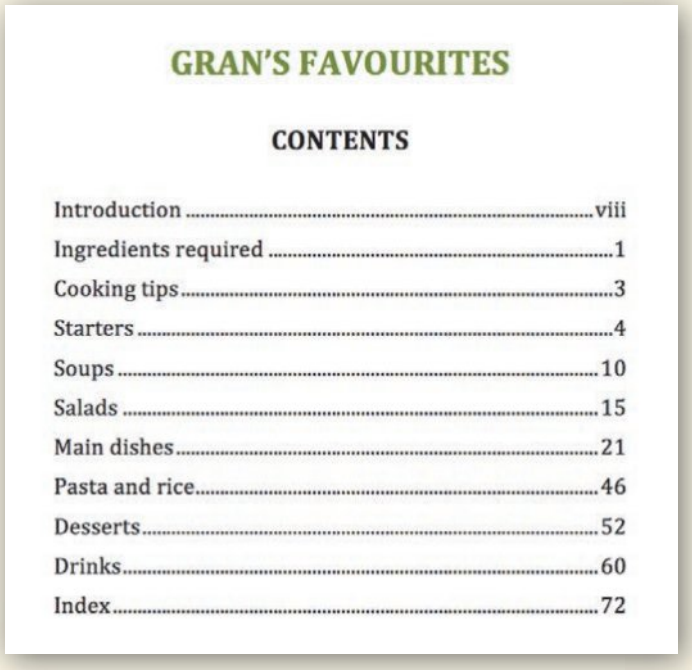
4 Once all the text has been entered, format the headings.



GRAN'S FAVOURITES

CONTENTS

5 Save the document, print preview it and check over it.

6 Resave the document and print a final copy or share your work electronically.

3.13 Using tabs within a letter

To practise the use of tab stops and indents you will produce the business letter shown on the next page. You will need to use the Ruler carefully.

Word processing exercise 11

Using tabs within a letter

Skills practised
- Tab stops
- Decimal tab stops
- Leader characters
- Indents

1 Enter the text of the letter without any formatting.

2 For the first table set three **CENTRE JUSTIFIED TAB STOPS** for the headings.

3 For the fees in the table set a **LEFT JUSTIFIED TAB STOP**. For the values set two **DECIMAL TAB STOPS** or **RIGHT JUSTIFIED TAB STOPS** if you are using Google Docs.

4 For the membership application form set a **LEFT JUSTIFIED TAB STOP** at the right of the Ruler and set this tab stop to have a leader character. If you are using Google Docs, enter the dashes and dots manually, without brackets.

5 As extra sections are needed in the application form, set more left justified tab stops and set them to have a leader character.

6 Spell check the document, print a copy, proofread the document and make any adjustments.

7 Print a final copy or share your work electronically.

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MANICURE GOLF CLUB

35 Green Grass Road, Sandringham Vic 3191

<Today's date>

Mr Anthony Mercuri
24 Austin Crescent
Frankston Vic 3199

Dear Mr Mercuri

Thank you for your inquiry about joining the Manicure Golf Club. We believe the club is one of the finest in the area and we certainly welcome new members. Our rates are listed in the following table:

Fee	Normal Rate	Pensioner Rate
Joining fee	$1050.00	$535.00
Yearly membership	$825.00	$295.00
Associate membership	$525.00	$95.00

Please detach and complete the membership application form at the bottom of this letter and send it to the club president.

Yours faithfully
Peter McLean
Secretary

MEMBERSHIP APPLICATION FORM

Surname Ms/Mrs/Miss/Mr .....

Given Names.....

Home .....

.....Postcode .....

Telephone: Business (.....) .....Home (.....) .....

Nominated by.....

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3.14 Using tables

The Tables feature of a word processing program allows you to quickly enter items in columns and rows without the need to insert numerous tab stops. The table is basically an abbreviated spreadsheet that can be inserted anywhere in the document.

Word processing exercise 12

Using tables

Skills practised
- Inserting a table
- Shading cells
- Adjusting borders
- Text alignments

1 Start a new blank document and insert a 2 x 4 table (two columns by four rows) using the **TABLE** icon in the **INSERT** tab of the ribbon or the **TABLE** option from the **INSERT** menu.

2 Highlight the two cells in **ROW 1** and merge them into one cell using the **MERGE CELLS** icon in the **LAYOUT** tab of the ribbon or **MERGE CELLS** from the **TABLE** menu.

3 Enter the text shown below into the appropriate cells and format it.

4 Highlight the text in the top row and apply a fill colour to it using the **SHADE** icon in the mini-toolbar or the **BACKGROUND COLOUR** icon in the toolbar.

5 Highlight the labels in the left column and set them to the same colour as the top cell shading then right align them.

6 In Microsoft Word, highlight all the cells and use the **BORDERS** icon in the **DESIGN** tab of the ribbon to select **NO BORDER** to turn the borders off, then select **OUTLINE** to just display a border around the outside of the table.

In Google Docs you cannot remove just some of the borders from cells, but you can display very light borders. Highlight all the cells and use the **BORDER COLOUR** icon in the toolbar to select a light shade of the same colour as the top cell. You can also use the **BORDER WIDTH** icon to set the border to .5 pt.

SeaView High School	
Term 3 Dance	
Date:	Thursday, 30 August, 2018
Time:	7:30 pm to 10:30 pm
Venue:	Centenary Hall 455 Fisherman's Bend Road Hervey Bay, Qld, 4655

7 Save the table under an appropriate name, check over the document and print a copy or share your document electronically.

Note: In Microsoft Word you might like to try some of the provided **TABLE STYLES** in the **DESIGN** section of the ribbon.

ISBN 978-1-316-62393-0

3.15 More detailed tables

When detailed tables are required in a document it is more appropriate to use the Tables feature if the software provides it, rather than setting tab stops.

Word processing exercise 13

More detailed tables

Skills practised
- Inserting a table
- Shading cells
- Text alignments
- Entering formulas

1 Create the business letter shown on the following page, leaving a space for the table after the second paragraph.

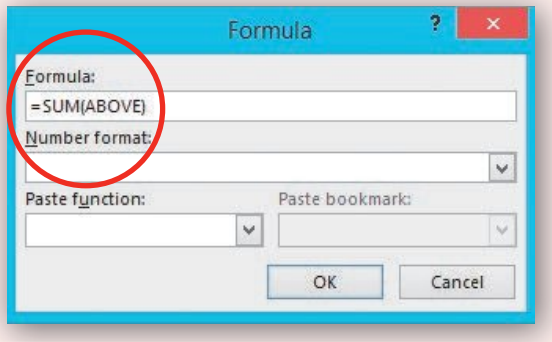
2 You can create a logo for the company using WordArt or by setting the text to a text style.

3 Click on a blank line after the second paragraph and insert a 5 x 7 table (five columns by seven rows) using the **TABLE** icon in the **INSERT** tab of the ribbon or the **TABLE** option from the **INSERT** menu.

4 Enter the text and values into the table and format them appropriately.

5 Highlight the text in the top and bottom rows in turn and apply a light background colour using the **SHADING** icon in the mini-toolbar or the **BACKGROUND COLOUR** icon in the toolbar.

6 In Microsoft Word, formulas can be used to calculate the totals for each year. Click in the **TOTALS** cell for 2014 and click on the **FORMULA** icon in the **LAYOUT** tab of the ribbon. Leave **SUM(ABOVE)** selected in the formula box and select **OK**.

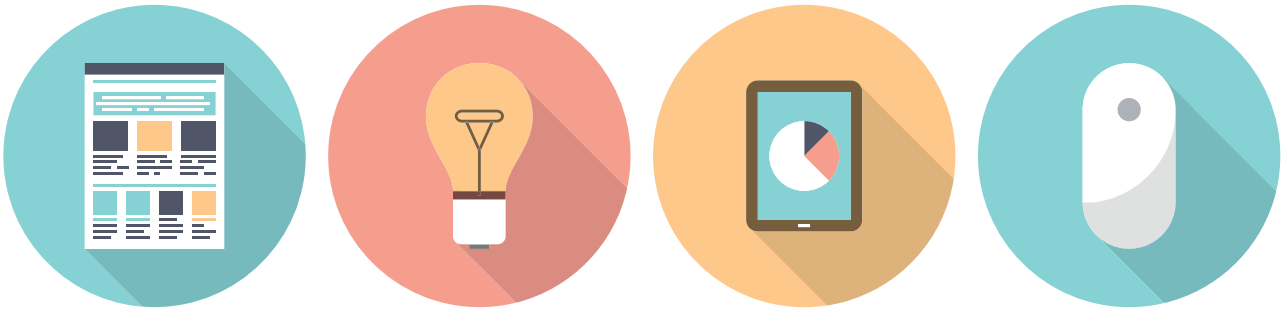


7 Repeat step 6 for the other years. You can click in each cell in turn and press <Ctrl+Y> or <Command+Y> to repeat the formula.

Note: Some versions of Microsoft Word may not recognise the blank cell below the Year as the cut-off point and add the year as well as the prices. Check that the totals are correct; they are displayed in the next point. If they are not, you can enter them manually.

8 In Google Docs, formulas cannot be entered into tables, so enter the following values in the **TOTALS** cells: $78,034, $81,905, $87,489, $90,042.

9 Once the letter is complete, save it, spell check it and proofread it. Once corrections have been made, print a final copy or share your work electronically.



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Easy Money Fundraising

5 March 2018

The Fundraising Manager
Stevenson High School
Stevenson Street
Seven Hills, NSW, 2147

Dear Sir/Madam

Thank you for your inquiry regarding fundraising options we can offer to your organisation.

Easy Money Fundraising has a range of successful programs that you could use in your school. Successful marketing and well-known brand names back each of the programs. These two factors ensure large sales. The programs are also supported by our administration team, which means a minimum of effort on your part.

	2014	2015	2016	2017
Programs				
Chocolate Box	$35,257	$37,895	$39,856	$38,546
Lamingtons	$10,965	$9,568	$11,258	$10,253
Hot Cross Buns	$8,656	$8,597	$8,521	$8,658
The Lolly Shop	$23,156	$25,845	$27,854	$32,585
Totals				

The Chocolate Box and The Lolly Shop are by far the most popular. More information on each of the programs is included in the attached flyer. For any further information you require please contact Annabelle on 03 9876 5432 during office hours.

Yours sincerely

Rose Royale
Marketing Director

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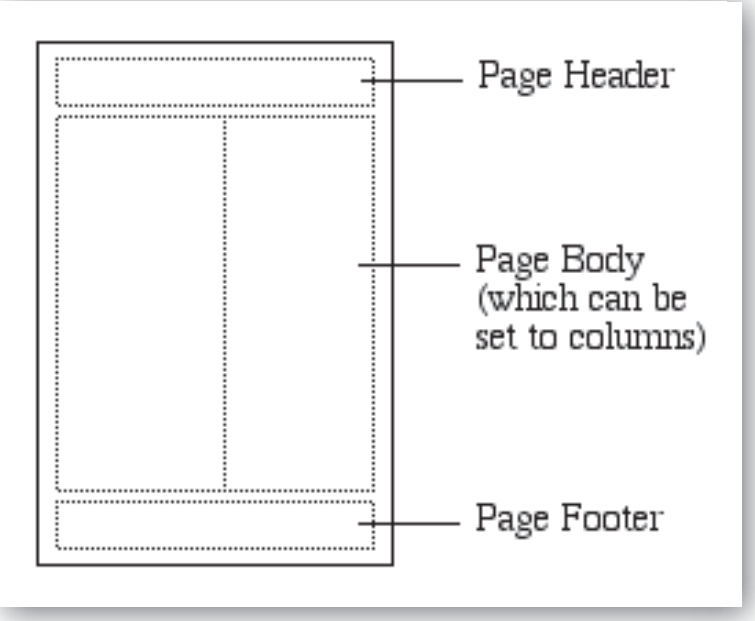
3.16 Page formats

Formatting pages involves such things as setting the page into columns or adding headers and footers. Pages can be set to display text in multiple columns. The text flows down the first column then down the second column, etc. At the top of each page there is a section set aside for a header. Text or graphics set in the header section are displayed at the top of each page. At the bottom of each page there is a section set aside for a footer. Text or graphics set in the footer section are displayed at the bottom of each page.



Word processing exercise 14

Page formats

Create the newsletter shown on the next page. The text articles can be loaded from the Practice IT Book 1 (PIT1) Support Files. You will need to enter the header and footer text.

Skills practised
- Formatting text
- Inserting columns
- Using headers and footers

1. Load the Exercise 14 text from the PIT1 Support Files.
2. In Microsoft Word, format the text into two columns. There is a **COLUMNS** icon in the **PAGE LAYOUT** tab of the ribbon. Highlight the text and justify it. If you are using Google Docs, you will need to insert a two-column, one-row table. You can then set the border width of the table to 0 using the **BORDER WIDTH** icon in the toolbar.
3. Add a header and footer. There are **HEADER** and **FOOTER** options in the **INSERT** tab or **INSERT** menu. Text is formatted in the header and footer in the same way as other text.
4. In Microsoft Word, you need to click on the **CLOSE HEADER AND FOOTER** icon in the **DESIGN** tab to close the header and footer view.

   In Google Docs, simply click back on the document text to close the header and footer panes.
5. Save the document then spell check the document and carefully proofread it.
6. Make the corrections to the document, resave it and print a copy or share your work electronically.

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BUNBURY LIBRARY GAZETTE

Volume 2 — Header — *June, 2017*

Your Community Library

As part of the Free Public Library Service, your Lismore Community Library welcomes you to avail yourself of its facilities. Membership is FREE and it costs nothing to borrow a book. To enrol simply complete an application form and provide proof of address, and you will be given a Free Membership Card. This card can be used to borrow books from any of the Regional Library branches. There is no limit to the number of books you can borrow, but we do ask that you borrow no more than two books on the same subject. Up to four magazines may be borrowed. Online facilities are also available

Finding a Good Book

The Lismore Library is fully automated with three public access terminals providing speedy access to books and periodicals, either by title, author or subject. The catalogue is on line to the other regional libraries so, if the book is not available at Lismore, it can be reserved from the other regional branches. If you have a fear of technology, the old card catalogue system still remains. Help is always available from the librarians simply by asking at the Advisor's Desk.

Share Your Reading

The Lismore Book Club has operated for over a year now and its membership has been steadily growing. New members are most welcome – it is open to anyone who wishes to participate. Meetings are held once a month with members expected to provide a book review of a book they have read that month. As well, discussions about topical books are conducted, reading strategies arranged and suggestions about future reading made. The aim of the club is to encourage people to read more and to share their experiences. If you would like to join the growing band of avid readers, please contact the Library staff.

Myth, Legend or Fact?

The Loch Ness Monster has fascinated people for centuries. Sightings and photographs have constantly surfaced, yet no-one has convinced the sceptics of the monster's existence. At last there is a book that says it has the answers. It's called The Truth About Lochy by Arthur Robinson. We won't spoil your curiosity by telling you what conclusions the author has made – let's just say you will be pleasantly surprised.

The Bunbury Community Library
Kresta Road, Bunbury, WA, 6231 — Footer

ISBN 978-1-316-62393-0

3.17 Inserting graphics

Media such as pictures, photographs or video clips can be added to documents. This can enhance the appearance of the document. The program may have its own Clip Art library of sketches or your school may have a library of graphics that you can use in your documents.

To illustrate the use of graphics, you will produce the flyer for Emma's Jazz Café shown below. If you haven't used the Drawing Tools before, your teacher may wish you to work through Module 4: Drawing tools before starting this activity.

Word processing exercise 15

Inserting graphics

Skills practised
- Inserting images
- Adjusting images
- Formatting images

1 Enter the text shown below and format it. You can use **WORDART** for the main heading or set the text to **SHADOW** and **OUTLINE**.

2 The Clip Art sketch will need to be inserted from your school's graphics library or from the internet. Click on the **PICTURE** icon in the **INSERT** tab or select **IMAGE** from the **INSERT** Menu and locate a music image.

3 Adjust the size of the image by dragging its handles and use the **WRAP TEXT** icon or option to set the position of the image.

4 Save the document, spell check it then carefully proofread it.

5 Make the corrections to the document, resave it and print a copy or share your work electronically.

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3.18 Multiple-page documents

When headers and footers are used in a document you often don't want them displayed on the first page. This page might be a title page that introduces the document.

Headers and footers can be turned off completely, or from just the first page of a document. To illustrate this you will create a two-page recipe shown below and on the next page. The first page will be a title page with a graphic. The recipe itself is on the next page. It will require the use of hanging indents and a header.

Word processing exercise 16

Multiple-page documents

Skills practised
- Inserting images
- Formatting images
- Using page borders
- Creating a title page
- Inserting page breaks
- Inserting footnotes

1 Enter the text for the title (or first) page and format it.

2 Insert an appropriate graphic on the title page, resize the image, set its text wrapping and add a page border to the page.

3 Insert a page break and enter the recipe. There is a **PAGE BREAK** icon in the **INSERT** tab or in the **INSERT** menu.

4 Open the **HEADER** section and enter the title of the recipe ('Continental Cheese Cake'). The **HEADER** option is in the **INSERT** tab or **INSERT** menu.

5 Set the document so that the headers and footers are not displayed on the title page. (There is a **DIFFERENT FIRST PAGE** icon in the **HEADER AND FOOTER** tab in Microsoft Word or under the header in Google Docs.)

6 Close the **HEADER** section or click back in the page.

7 Enter the recipe shown on the next page without the footnote numbers or footnote text. Use tab stops to align the ingredients and use a numbered list for the points of the method.

8 Set the cursor just after 50 g and insert a footnote by selecting **FOOTNOTE** from the **REFERENCES** tab or **INSERT** menu and enter 50 g = 2 oz.

9 Repeat step 8 for 300 ml and 180°C to enter 300 ml = 05 pt and 180°C = 350°F.

Note: The degree symbol can be entered by pressing <Shift+Alt+8> or <Shift+Option+8>.

10 The following footnotes to the recipe should be displayed at the bottom of a page:

[1] 50 g = 2 oz

[2] 300 ml = 0.5 pt

[3] 180°C = 350°F

11 Spell check the document, print a copy, proofread it and make any adjustments.

12 Print a final copy of your two pages or share your work electronically.

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CONTINENTAL CHEESE CAKE

Ingredients (Metric Measurements)

Base

50 g[1] caster sugar
50 g self-raising flour
50 g margarine
15 g baking powder
1 egg

Filling

500 g cream cheese
300 ml[2] double cream
75 g margarine
50 g caster sugar
50 g plain flour
1 egg
1 lemon, juice and rind
50 g sultanas

Method

1 In a large bowl mix together all the ingredients for the base. Spread on the base of a greased 23 cm tin.
2 Work the cream cheese until smooth, add in the cream and beat together.
3 Cream the margarine, sugar and lemon rind together in another bowl until smooth. Gradually add the flour, lemon juice and rind, egg and sultanas.
4 Fold in the cheese and cream mixture and mix until smooth.
5 Pour on top of the base mixture in the tin. Bake at 180°C[3] for 1¼ to 1½ hours. Allow to cool. Remove the tin and chill.

[1] 50g = 2 oz
[2] 300 ml = 0.5 pt
[3] 180°C = 350°F

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WORD PROCESSING PROJECT

You are the manager of Emma's Jazz Café, which specialises in fine seafood served to fine music. Up until now, a local printing company has produced the menus. The problem is that the menus are constantly changing due to the seasonal availability of certain foods, resulting in the cost of constantly updating the menus becoming too high.

You have decided to produce the menus within the café and update them as required. You need the first menu created. The text can be downloaded from the PIT1 Support Files on *Cambridge GO* or with your teacher's approval you can collect your own menu items. The file is called: WP Project Text. The menu will need to be two pages, which can be printed back to back then placed on tables. It will be up to you to find appropriate graphics from Clip Art and decide on the appropriate format for the data.

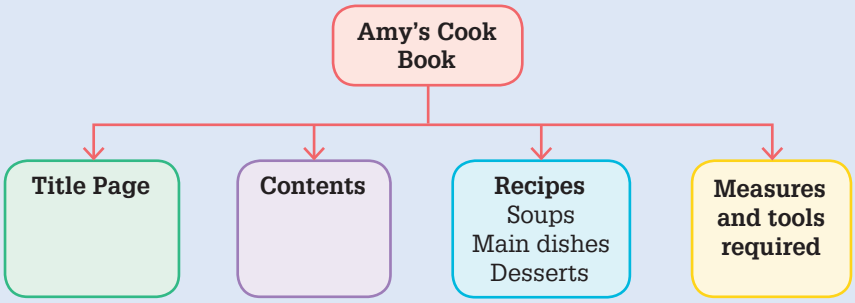
Collecting the data

Plan the format your publication will take (newsletter, flyer and number of columns, etc.) and work out what graphics you will need to collect (check the Clip Art). If you are including your own menu, you will need to collect the items for it.

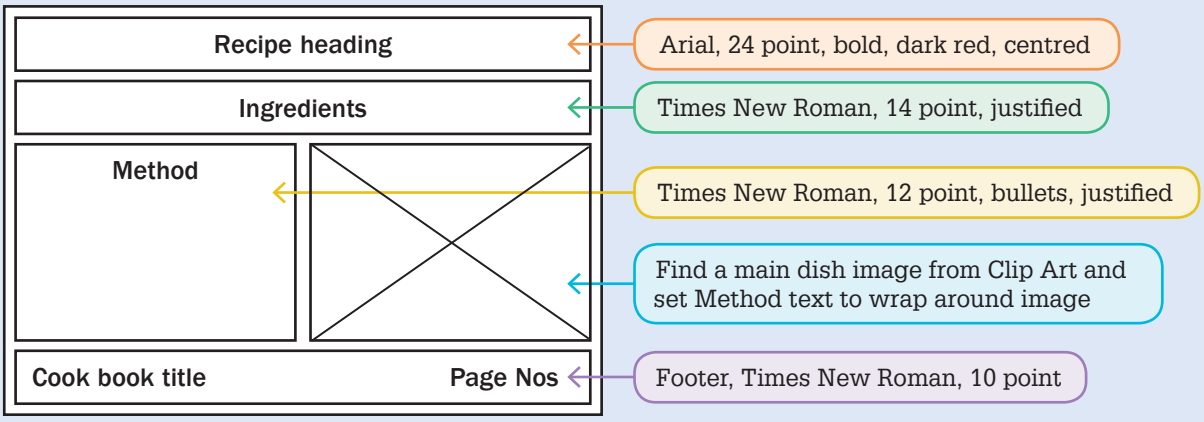
Defining the solution

> Draw thumbnail sketches for each page of your publication. Include what fonts and styles you are going to use, columns, tab types and where the graphics will be placed, etc. The following diagrams show examples of the planning you should do.

> If there are differently formatted pages in your document, draw a Structure Diagram to indicate the different pages. For example, for a cookbook:



> Draw a detailed layout (or mock-up) diagram to show how each different page will look. The diagram should include the format of the text – headings, subheadings and text body, any images to be inserted or drawing tools to be used. Refer to the following.



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Implementing

Use your word processing skills to produce the solution and print a copy of it.

Evaluating, collaborating and managing

1 Ask other people to look at your publication and give you feedback on the quality and accuracy of your publication. Describe what was said and the changes you made to your document because of their comments.

2 How will your solution make the operation of Emma's Jazz Café easier in the future?

Project data: café data

Café details

Emma's Jazz Café

A restaurant of fine seafood served to fine music. Only organic ingredients are used.

Open 7:00 a.m. to 11:00 p.m. 7 days
23 Sturt Street, Walkerville, SA, 5081
Phone (08) 8317 9007
Fax (08) 8317 9008
Email orders@emmas.com.au
Web www.emmas.com.au

Menu details

Appetisers

Seafood and Avocado Cocktail $5.25
Avocado overflowing with deep sea scallops and green prawns.

Sardines in a Crust $5.95
Deliciously crisp served with lemon wedges.

Calamari $7.80
Deep fried to perfection with a zesty Italian sauce.

Oysters Rockefeller $8.30
Half a dozen oysters topped with traditional spinach sauce.

Crab in Parsley Crepes $6.75
Lightly curried and generously filled.

Mushroom Mousse $4.30
Gently pureed with walnuts and lemon.

Salads and Soups

Roman Salad $3.00
A blend of romaine lettuce, seasoned croutons, anchovies, eggs and grated parmesan.

Crunchy Spinach Salad $2.55
Fresh young spinach leaves topped with avocado and black olives.

Seafood Salad $10.50
A light and easy meal of prawns, crab, scallops and your favourite dressing. Ideally served with white wine.

Onion Soup with Beef and Cheese $2.65
Our own version of French onion soup topped with a generous sprinkling of grated parmesan.

Fishmonger's Special $2.95
Clam chowder served light yet creamy with the added piquancy of white wine.

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Main Courses

Gratin of Fish of the Day with Sauces $9.55

Fillets gently broiled and served with a combination of béchamel and fresh tomato sauce.

Trout of the Jura $11.50

Whole trout poached in a Jura Rosé. Ideally served with a fine red wine.

Prawns on a Golden Base $13.75

Green prawns sautéed in ginger, garlic and lemon juice served on a bed of pawpaw.

Scallops with Mushrooms $11.65

Sautéed in butter, garlic and parsley, served in a pair of coquille shells. Ideally served with the House white wine.

Lobster with Herb Butter $19.45

Whole lobster baked in butter and fresh herbs and served with a squeeze of lemon.

Desserts

Creme Caramel $5.00

Homemade caramel custard.

Mousse au Chocolat $5.00

The House chocolate mousse.

Profiteroles $6.00

Two puffed pastries, stuffed with Amy's ice-cream and topped with a warm chocolate sauce.

Drinks

Coffee $1.50

Espresso $2.00

Cappuccino $2.50

Hot Tea $2.00

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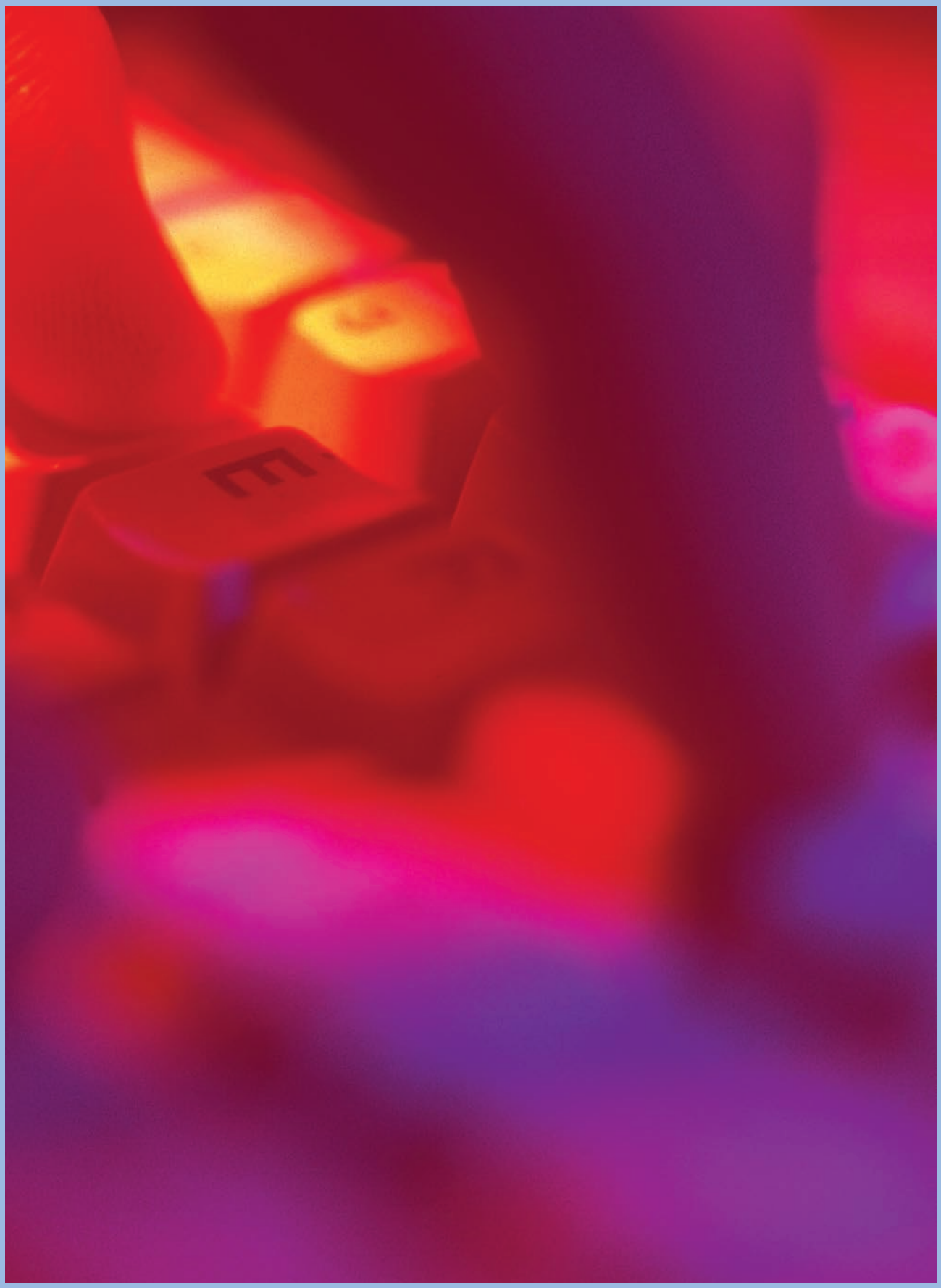

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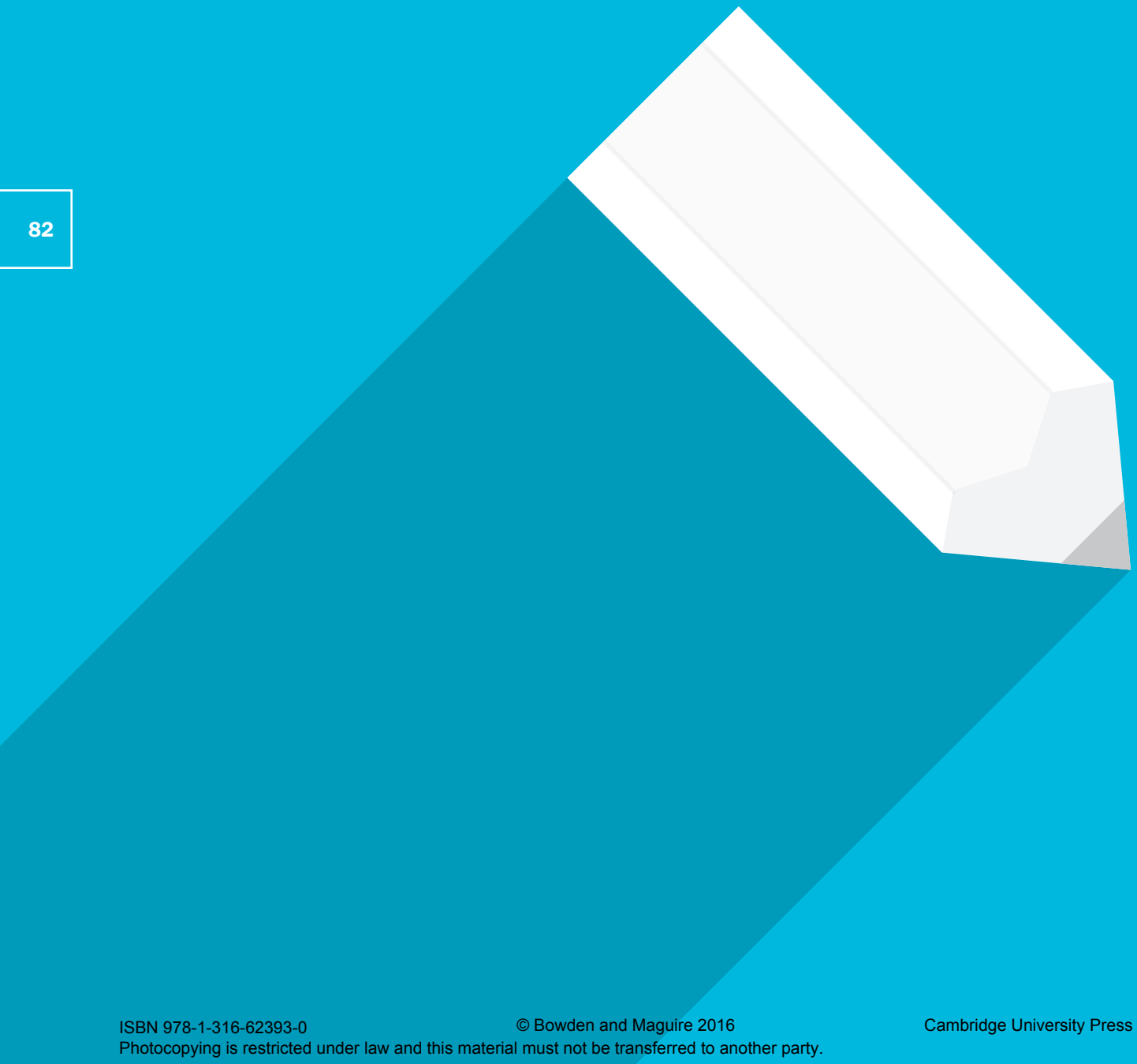
Module 4

DRAWING TOOLS

Programs featured for exercises:

Microsoft Office
Google Drawings



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Teacher information

IT knowledge and skills covered in this module

- Drawing tools
- Drawing shapes
- Editing objects
- Enhancing shapes
- The text box tool
- Using graphics

Suggested further uses across the curriculum

- English (for creating information posters or flowcharts). Use a range of software, including word processing programs, to confidently create, edit and publish written and multimodal texts (ACELY1728).
- History (for creating timelines). Use a range of communication forms (oral, graphic, written) and digital technologies (ACHHS214).
- Visual Arts (for creating digital drawings). Practise techniques and processes to enhance representation of ideas in their art-making (ACAVAM121).
- Science (for creating classroom safety posters). Communicate ideas, findings and evidence-based solutions to problems using scientific language; and representations, using digital technologies as appropriate (ACSIS148).

Alignment with the Australian Curriculum

ICT Capability elements covered

- Investigating with ICT
  - > define and plan information searches
- Creating with ICT
- Communicating with ICT
  - > collaborate, share and exchange
  - > understand computer mediated communications
- Managing and operating ICT

Other general capabilities covered

- Literacy
- Critical and creative thinking
- Personal and social capability

Digital Technologies curriculum content in this module

Processes and production skills

- Analyse and visualise data using a range of software to create information, and use structured data to model objects or events (ACTDIP026)
- Define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints (ACTDIP027)
- Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032)

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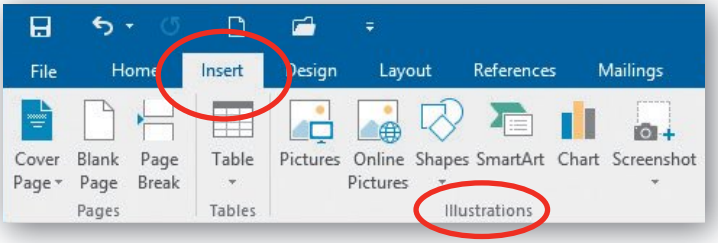
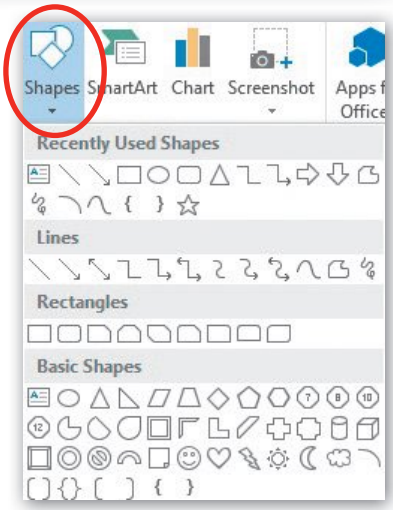
4.1 Drawing tools

The Microsoft Office suite of programs (Microsoft Word, Microsoft Excel, Microsoft PowerPoint and Microsoft Access) all share the same drawing tools. The Google Apps suite (Google Docs, Google Sheets and Google Slides) are linked to Google Drawings. This chapter will cover the drawing tools available to these programs.



The Microsoft Office Drawing Tools are accessed from the **ILLUSTRATIONS** group of the **INSERT** tab in the ribbon at the top of the Microsoft Office screen.



The Drawing Tools for the Google Apps can be opened by selecting **DRAWING** from the **INSERT** menu, which opens Google Drawings, or you can open the app directly.

4.2 Drawing shapes

You can select from a variety of different lines, basic shapes (such as circles, rectangles or common shapes), block arrows, flow chart symbols, callouts, and stars and banners.

Each object is created by dragging the mouse across the screen with the mouse button held down. Each shape drawn is said to be an object and these objects can be moved, copied, resized and deleted.

Drawing tools exercise 1

Drawing shapes

Skills practised
- Drawing shapes such as rectangles, lines, arrows and circles

1. Load Microsoft Word and start a new blank document or open Google Docs and select **DRAWING** from the **INSERT** menu to open Google Drawings.
2. Select the **RECTANGLE TOOL** from the **SHAPES** icon in the **INSERT** tab of the ribbon or from the toolbar in Google Drawings and drag a rectangle anywhere on the screen.
3. Select the **RECTANGLE TOOL** from the **SHAPES** icon again and try drawing another rectangle with the `<Shift>` key held down. You should only be able to create squares. The `<Shift>` key is called the constraint key because it forces objects to be perfect shapes.
4. Try drawing some lines, arrows and ovals. In Google Docs there is a separate Line icon. Try each of these with the `<Shift>` key held down. For example:

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4.3 Editing objects

Objects can be resized, moved, copied (duplicated) and deleted.

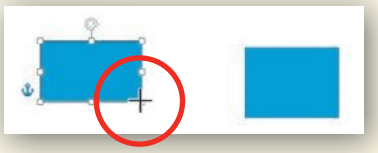
Drawing tools exercise 2

Skills practised
- Editing shapes
- Deleting shapes
- Copying shapes
- Moving shapes

Editing objects

1 Click on one of the rectangles and notice that the rectangle has handles (small solid bars) around it. These allow the rectangle to be resized. The handles at the corners allow for diagonal resizing. The handles at the centre of the lines allow for either vertical or horizontal resizing and the circular handle outside the shape allows the object to be rotated.

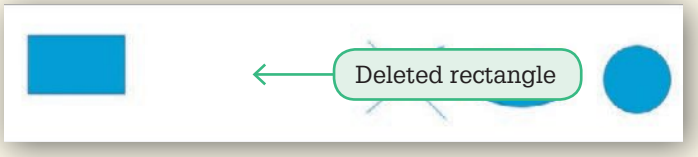
2 Move the pointer over the bottom right corner handle until the pointer changes to diagonal lines. Hold down the mouse button and drag the corner 'handle' towards the centre of the rectangle. This reduces the rectangle's size. Dragging in the other direction would have increased its size.



Deleting objects

1 You should have a number of objects on the screen at the moment.

2 Click the mouse button with the pointer over the border of an object to display its handles. If an object is filled, you can click on the centre of it to select it.



3 Press the <Backspace> (or <Delete>) key and the object will be removed.

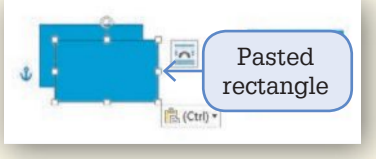
4 Selecting **UNDO** from the Quick Access toolbar or Edit menu (or pressing <Ctrl+Z> or <Command+Z>) will return a deleted object, so long as nothing else has been entered, deleted or copied in the meantime. Try it.

Copying objects

1 Click on the first rectangle's border to display its handles, or redraw a rectangle if you do not have one on your screen.

2 Press <Ctrl+C> or <Command+C> to copy the rectangle.

3 Press <Ctrl+V> or <Command+V> to paste the rectangle and a copy of the rectangle should be placed on the screen.



Note: Cut works the same way as Copy except that the original object is removed from the screen. An object can be pasted as many times as required.

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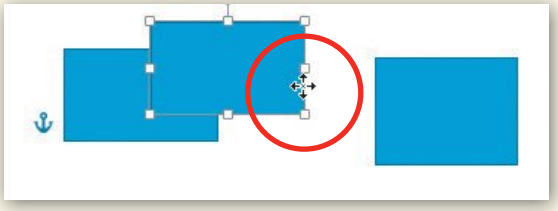
Moving objects

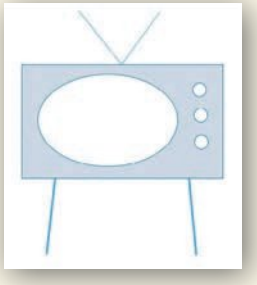
1 Move the pointer over the border of the rectangle (not near a handle). The pointer should have a cross-hair with arrows next to it indicating that it can be moved in any direction. Hold the mouse button down and drag the pasted rectangle to another part of the screen.



2 When moving objects the pointer must not be positioned over a handle.

Note: The Arrow keys can be used to nudge objects into place.

3 Try creating the sketch of an old-fashioned TV set shown on the right and edit it so that its lines are flush, that is, meet perfectly with one another. The **SHAPE FILL** icon in the ribbon or the **FILL COLOUR** icon in the toolbar can be used to set the fill to a **COLOUR**, **NO FILL** or **TRANSPARENT**.



4.4 Enhancing shapes

Inserting shape fills, shape outlines, shadow effects and 3-D effects can enhance the appearance of shapes.

Drawing tools exercise 3

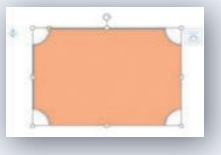
Shape fills

Skills practised
- Filling shapes
- Fill colours and patterns
- Adjusting borders
- 3D effects

1 Start a new document or delete all the shapes.

2 Use the **SHAPE** icon from the ribbon or toolbar to select a **PLAQUE** shape and drag a rectangle on a blank screen. The rectangle should take the plaque shape. All shapes are created this way.

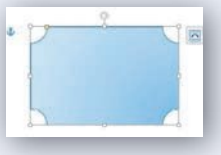
3 Use the **SHAPE FILL** icon in the ribbon or the **FILL COLOUR** icon in the toolbar to select a colour to fill the shape.



4 In Microsoft Word, the **SHAPE FILL** icon in the ribbon can be used to change the fill to a **TEXTURE**.

5 In Microsoft Word, the **SHAPE FILL** icon in the ribbon can also be used to change the fill to a **GRADIENT**.

In Google Drawings, the **FILL COLOUR** icon can be used to select **CUSTOM** and the fill colour adjusted to the colour you want.



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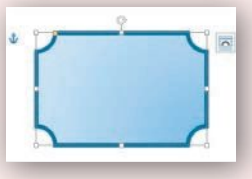
Drawing tools exercise 4

Shape outline

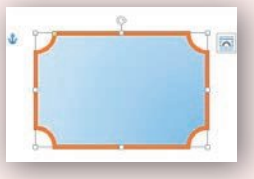
Skills practised
- Adjusting shape border thickness
- Adjusting shape border colour

1 Use the **WEIGHT** section of the **SHAPE OUTLINE** icon in the **FORMAT** tab of the ribbon or the **LINE WEIGHT** icon in the toolbar to change the thickness of the border around the shape.



2 Use the **SHAPE OUTLINE** icon in the **FORMAT** tab of the ribbon or the **LINE COLOUR** icon in the toolbar to change the colour of the border around the shape.

Note: You might like to also use the **SHAPE OUTLINE** or **LINE DASH** icons to change the border to dashes or dots.



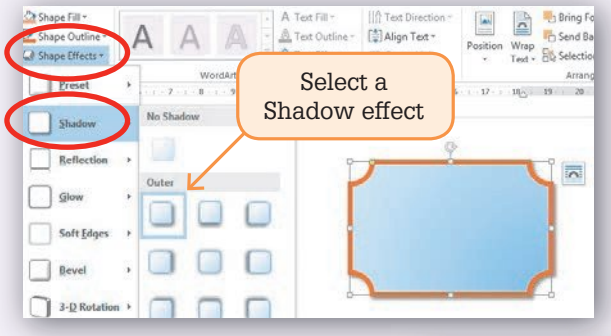
Drawing tools exercise 5

Shadow effects

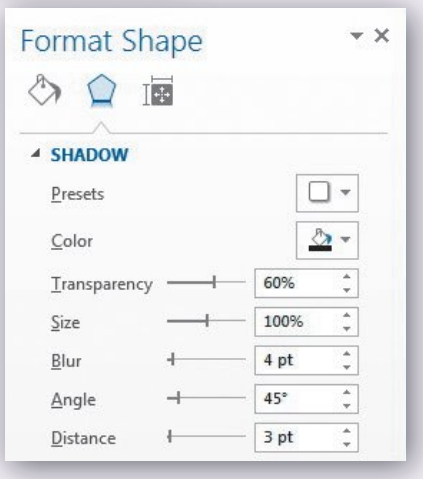
This exercise only applies to Microsoft Office.

Skills practised
- Adding shadow effect to a shape
- Adjusting shape shadow effects

1 Use the **SHADOW** section of the **SHAPE EFFECT** icon in the **FORMAT** tab of the ribbon to select a shadow type for the shape.



2 Selecting **SHADOW OPTIONS** at the base of the **SHADOW** list in the **SHAPE EFFECT** icon opens the **FORMAT SHAPE** pane where adjustments to the shadow can be made. Try some adjustments.



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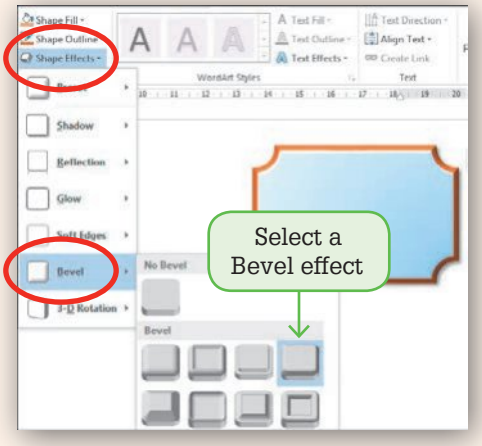
Drawing tools exercise 6

3-D effects

This exercise only applies to Microsoft Office.

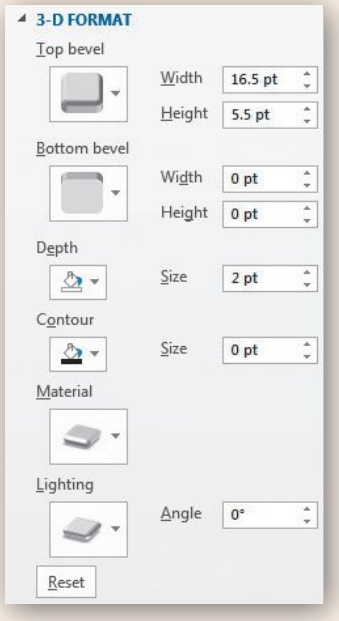
Skills practised
- Bevel effects
- Bevel options

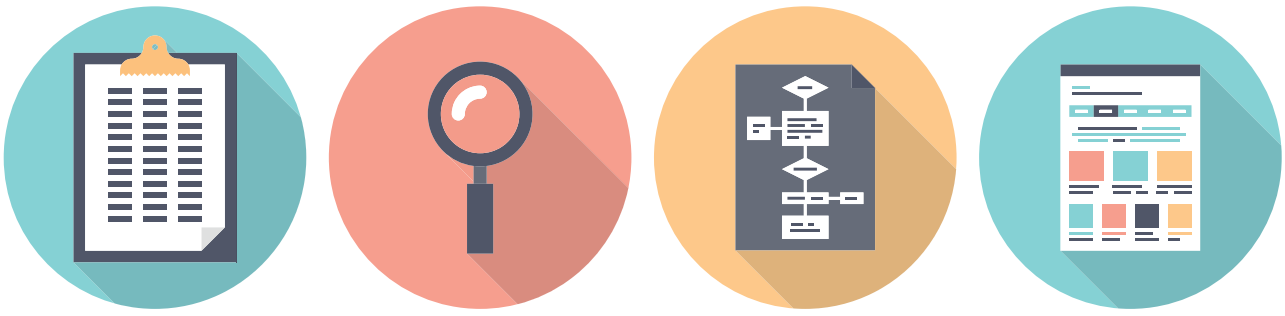
1 Click on the **SHAPE EFFECTS** icon in the **FORMAT** tab of the ribbon, select **BEVEL** and select a bevel option to add a 3-D effect to the object.



2 The **3-D OPTIONS** at the base of the **BEVEL** options can be used to open the **3-D FORMAT** section of the **FORMAT SHAPE** pane to adjust the bevel. Try some of the options.

3 You might like to experiment with some of the other shape effects such as Reflections, Glows and Soft Edges.





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4.5 The Text Box tool

Text can be entered within some shapes, but you can also add a Text Box over a shape to add text to that shape. The Text Box tool is used to place text in a frame anywhere on the screen. It can be edited in the same way as the previous objects and the text in the Text Box can be formatted like any other text in the Microsoft Office programs or in the Google applications.

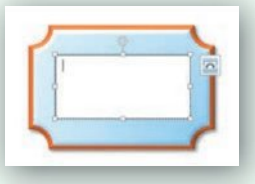
Drawing tools exercise 7

The Text Box tool

Skills practised
- Text Box tool
- Formatting text
- Filling objects
- Send to back
- Bring to front
- Grouping objects

1 Select the **TEXT BOX** icon from the **FORMAT** tab of the ribbon or from the toolbar.

2 Drag a frame within the plaque shape.



3 Enter your first name, then highlight the name and set the text to a font of your choice, the font size to larger such as 24 pt, the style to bold and the font colour to a colour of your choice.

4 Click on the border of the Text Box and use the **SHAPE FILL** icon in the ribbon or the **FILL COLOUR** icon in the toolbar to select **NO FILL** or **TRANSPARENT** to remove the white background from the text box.

5 The **SEND BACKWARD** option in the ribbon or in the **ORDER** section of the **ACTIONS** menu can be used to set the text box behind the plaque.

6 The **BRING FORWARD** option in the ribbon or in the **ORDER** section of the **ACTIONS** menu can be used to return the text box to be on top of the plaque.

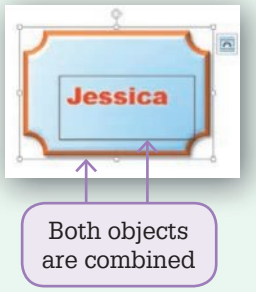
7 Click on the border of the Text Box and drag it so that the name is in the centre of the plaque.

Note: You can resize the text box using its handles so that the Text Box frame just encloses the text.

8 Hold down the <Shift> key and click on the plaque so that both it and the Text Box are selected, then use the **GROUP** icon in the ribbon or the **GROUP** option in the **ACTIONS** menu to combine the two objects into one.

9 Try moving the objects to another part of the document. They both move together.

Note: Objects can be ungrouped by selecting **UNGROUP** from the **GROUP** icon in the ribbon or from the **ACTIONS** menu.



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4.6 Using Clip Art

Images and Clip Art can be inserted into documents when required. The graphics can include sketches, photographs or video clips from your school's image library or from the internet. You can also insert graphics created in other programs such as Adobe Photoshop, Adobe Illustrator and Adobe Fireworks.

Drawing tools exercise 8

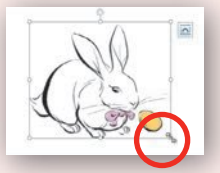
Using Clip Art

Skills practised
- Inserting images
- Inserting Clip Art
- Image styles
- Image borders
- Image effects
- Image adjustments
- Cropping images
- Text wrap

1 Start a new document or delete the objects from the screen.

2 In the **INSERT** tab of the ribbon select the **ONLINE PICTURES** icon or select **IMAGE** from the **INSERT** menu.

3 Carry out a **SEARCH** for an animal on the internet or from your school's image library – for example, rabbit – and select one.



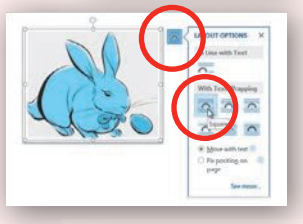
4 The image can be resized using its size handles. Hold down the `<Shift>` key when you do this if you want the image's length and width proportions to be maintained.

5 Try some of the **PICTURE STYLES** in the Microsoft Word ribbon or the **IMAGE** options in the Google Docs toolbar to format the image.

6 Use the **COLOUR** icon in the ribbon or the **RE-COLOUR** icon in the Image Options pane to select a colour for the image.

7 There are **PICTURE COLOUR OPTIONS** at the base of the **COLOUR** icon or **PICTURE ADJUSTMENTS** in the **IMAGE OPTIONS** that can be used to adjust the selected colour. Try some.

8 In Microsoft Word, the **LAYOUT OPTIONS** icon next to the image allows you to set how text flows around the image. For example, **SQUARE** means the text will flow around the border of the image.



In Google Drawings, the frame below the image allows you to set how text flows around the image. For example, **WRAP TEXT** means the text will flow around the border of the image.

9 Use the **PICTURE BORDER** icon in the ribbon or the **LINE COLOUR** icon in the toolbar to select a colour for the border (or frame) around the image.

Note: You can also use the **WEIGHT** option in the **PICTURE BORDER** icon or the **LINE WEIGHT** icon in the toolbar to change the thickness of the border.

10 In Microsoft Word you can also apply **PICTURE EFFECTS** to the image such as Shadows, Glows, Reflections and Bevels. Try some.

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Drawing tools exercise 9

Cropping Clip Art

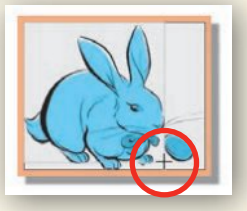
Images can be cropped so that just part of an image is displayed.

Skills practised
- Cropping images

1 Select the **CROP** icon from the ribbon or from the toolbar and crop bars are added to the border of the image.

2 Drag one of the bars to exclude part of the image.

3 Click outside the image to set the crop.



4.7 Aligning objects

When you enter multiple shapes into a document you can align those shapes accurately.

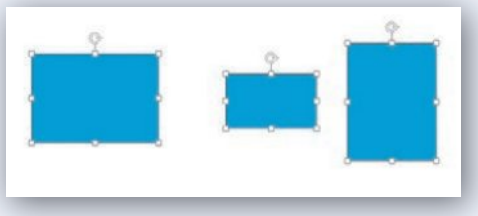
Drawing tools exercise 10

Aligning objects

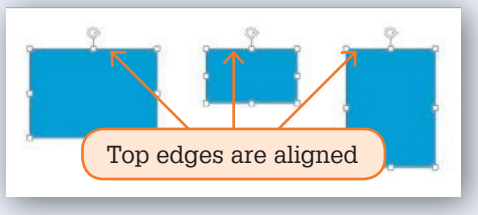
Skills practised
- Aligning shapes
- Aligning top edges
- Distributing space

1 Start a new document or delete the image from the screen.

2 Draw three different rectangles on the screen then hold down the <Shift> key and click on each rectangle so that each has its selection handles displayed.

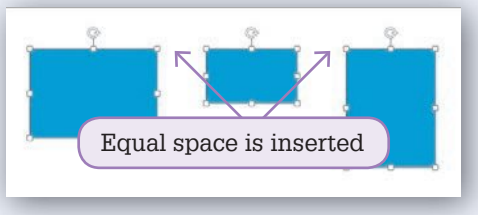


3 Click on the **ALIGN** icon in the Arrange group of the ribbon and select **ALIGN TOP** or click on the **ACTIONS** menu, highlight **ALIGN VERTICALLY** and select **TOP**. The rectangles will be moved so that their top edges are level with one another.



4 Click on the **ALIGN** icon again in the ribbon and select **DISTRIBUTE HORIZONTALLY** or click on the **ACTIONS** menu, highlight **DISTRIBUTE** and select **HORIZONTALLY**. This time the rectangles are moved so that the space between them is equal.

5 Experiment with some of the other alignments.



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4.8 Using WordArt

WordArt allows you to create fancy text headings.

Drawing tools exercise 11

Using WordArt

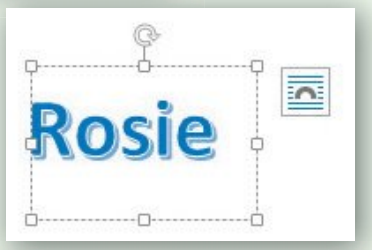
Skills practised
- Inserting WordArt
- Editing WordArt
- Formatting WordArt
- WordArt styles
- WordArt adjustments

1 Start a new document or delete the rectangles from the screen.

2 Click on the **WORDART** icon in the **INSERT** tab of the ribbon and select a WordArt style or select **WORDART** from the **ACTIONS** menu.

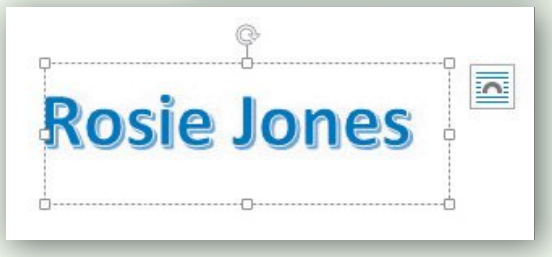
3 Enter your first name in the Edit WordArt Text frame and press `<Enter>` if you are using Google Docs.

4 You can change the WordArt style using the ribbon in Microsoft Word or by using the normal text format icons in the toolbar in Google Drawings.



5 You can edit the text at any time. Try adding your last name by clicking at the end of your first name in Microsoft Word or by double clicking in the WordArt frame in Google Drawings.

Note: WordArt acts like an image, so you can set the wrap text options in the same way as you do for images.



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4.9 WordArt enhancements

Microsoft Word WordArt offers many options to adjust the appearance of your text. For example, you can change the WordArt shape, add Shadows, Bevels and Rotations.

Drawing tools exercise 12

WordArt enhancements

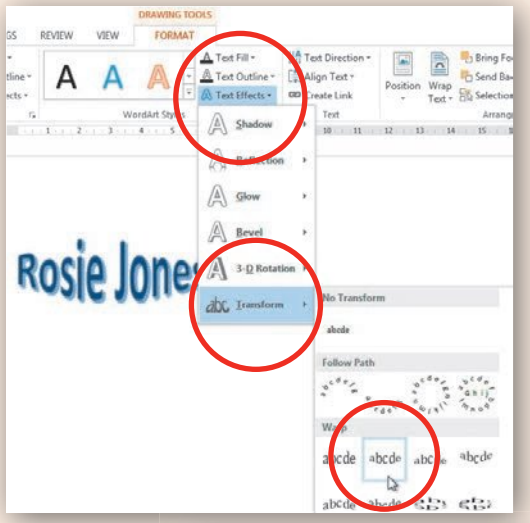
This exercise only applies to Microsoft Word.

Skills practised

- Adding text effects to WordArt
- Applying 3D rotation to WordArt

1 Select the border of the WordArt frame then use the **TEXT EFFECTS** icon in the **FORMAT** tab of the ribbon to highlight **TRANSFORM** and select a style for the WordArt.

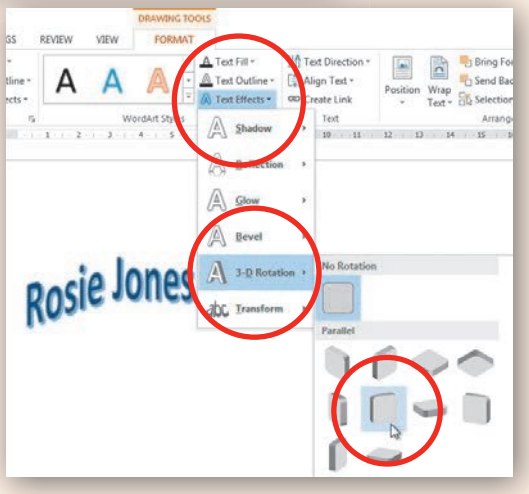
2 Try some of the other transformations and select the one that you like.

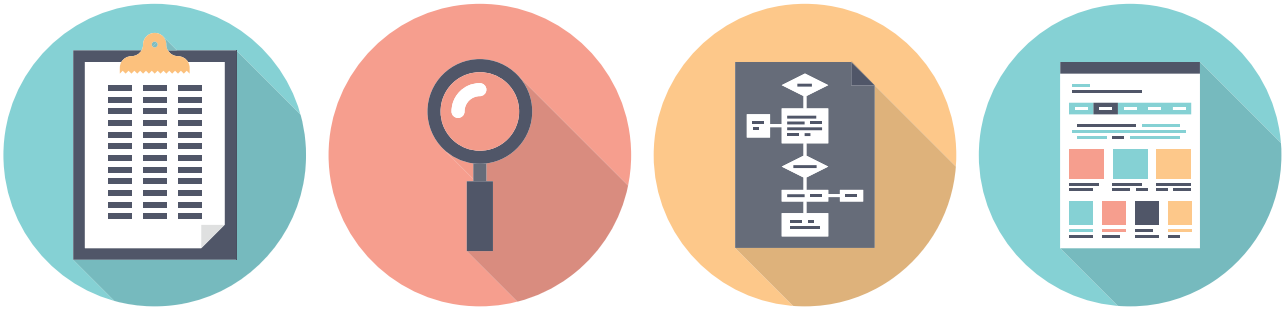


3 Try applying a **3-D ROTATION** to the WordArt.

4 Try some Reflection, Shadow and Bevel text effects.

5 The **ROTATE** icon in the **FORMAT** tab of the ribbon can also be used to rotate the WordArt text. Try some of the options.





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4.10 SmartArt Graphics

Microsoft Word provides SmartArt Graphics, which allows you to insert predrawn diagrams such as organisation charts, relationship diagrams, pyramid charts and the like.

Drawing tools exercise 13

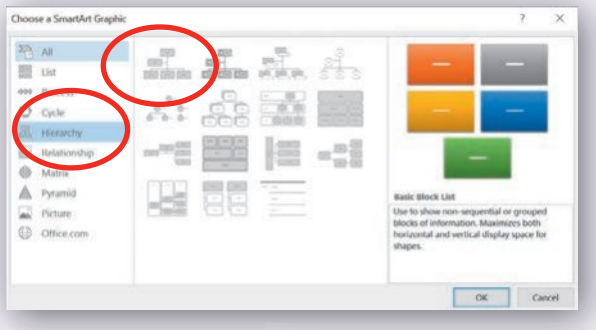
SmartArt Graphics

Skills practised
- Inserting SmartArt
- Changing chart colours
- Formatting charts
- Formatting chart boxes
- Changing chart layouts

This exercise only applies to Microsoft Office.

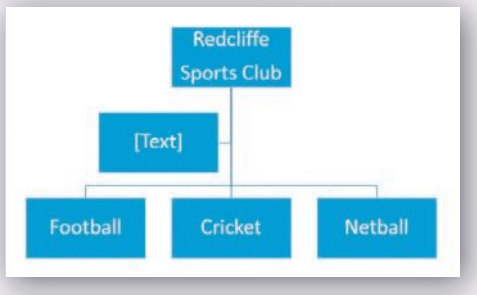
1 Start a new document or remove the WordArt text from the screen.

2 Click on the **SMARTART** icon in the **INSERT** tab of the ribbon, select **HIERARCHY** and select the first Hierarchy SmartArt style (the Organisation Chart).

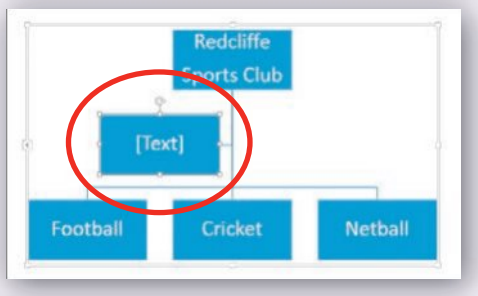


3 Select **OK** and the Organisation chart will be added to the page.

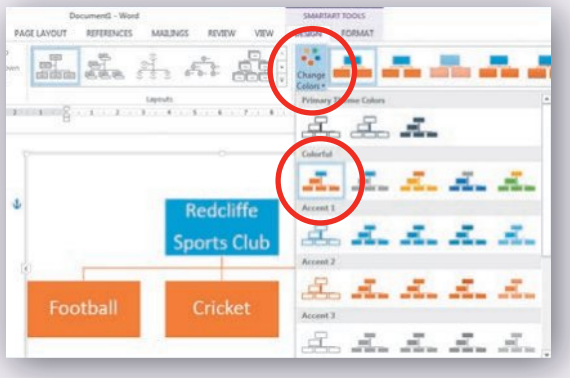
4 Click in the top box and enter `Redcliffe Sports Club`, then enter `Football`, `Netball` and `Cricket` in the bottom three boxes.



5 Click on the border of the box on the second row to select it then press the `<Delete>` or `<Backspace>` key to remove it from the chart.



6 A different colour scheme can be applied to the chart. Open the **DESIGN** tab of the **SMARTART TOOLS** in the ribbon, click on the **CHANGE COLOURS** icon and select a different colour scheme for the chart.



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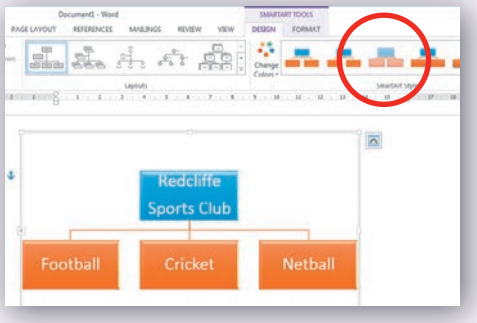
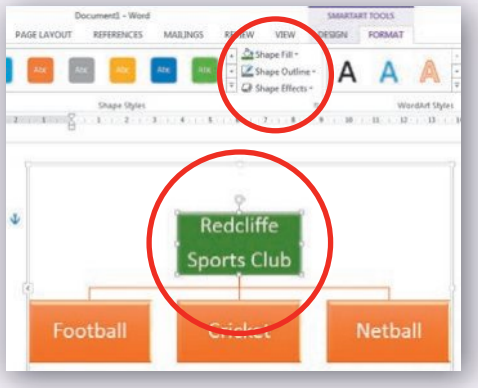
7 Try some of the **SMARTART STYLES** from the **DESIGN** tab of the ribbon to further enhance the chart.



8 Individual boxes in the chart can be formatted. Select the top chart box, open the **FORMAT** tab of the **SMARTART TOOLS** and apply a Shape Style, a Shape Fill, a Shape Outline and a Shape Effect.



9 The text within a box can be formatted. Highlight Redcliffe Sports Club and the mini-toolbar should be displayed.

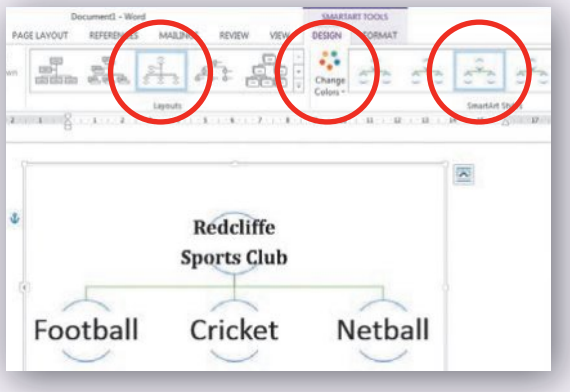
10 Set the font to a font of your choice, a different size, the alignment to centre and select a font colour.

Note: You can also use the icons in the Home tab in the ribbon to format the text.

11 You can change the organisation chart layout. Open the **DESIGN** tab of the **SMARTART TOOLS** and try some of the different **LAYOUTS** along with their **CHANGE COLOURS** and **SMARTART STYLES** options.

Note: Some options would need the text size of the boxes to be adjusted.

12 Experiment with some other SmartArt charts.



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DRAWING TOOLS PROJECT

Safety in the Science room

Your Science teacher has decided to place safety posters around the Science room to hopefully help prevent accidents. The teacher has asked you to produce one of the posters for the room.

You will need to find out four or five rules that are used to ensure safety in the Science room. For example, always wear safety goggles when heating chemicals.

Collecting the data

Find four or five safety rules that exist in the Science room and look through your school's graphics library or use the internet to locate two appropriate graphics that you can use in your poster.

Defining the solution

Draw a mock-up sketch on paper of the poster that you will be creating. Indicate what heading you are going to use, the page border, the fonts and font sizes, where the rules will be placed on the page, where the graphics will be placed, etc. There is an example of a mock-up sketch in the word processing project on page 78.

Implementing

Use the Drawing Tools to create the poster.

Evaluating, collaborating and managing

1 Ask other people to look at your publication and to give you feedback on the quality and accuracy of your poster. Describe what was said and what changes you made to your poster because of it.

2 What are the advantages of having posters produced on a computer as opposed to doing them manually? Are there any disadvantages?

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Module 5

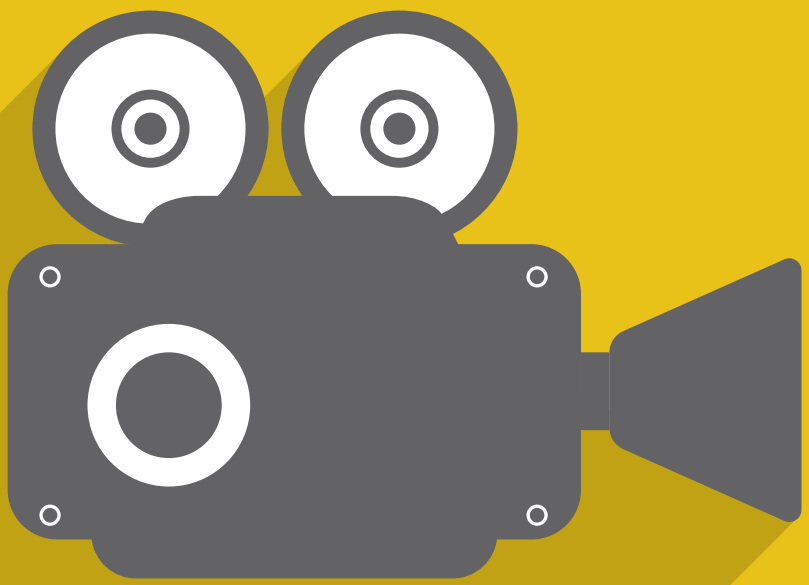
MAKING MOVIES

Program featured for exercises:

Windows Movie Maker

Alternative exercises available online using:

Adobe Premiere



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Teacher information

IT knowledge and skills covered in this module

- Introducing video editing
- Creating a new project
- Importing movie files
- Adding transitions
- Adding titles, credits and captions
- Editing clips with trim and split
- Adding and modifying audio
- Finalising a project
- Exporting files

Suggested further uses across the curriculum

- English (for creating videos). Use a range of software, including word processing programs, to create, edit and publish texts imaginatively (ACELY1738); plan, draft and publish imaginative, informative and persuasive texts, selecting aspects of subject matter and particular language, visual, and audio features to convey information and ideas (ACELY1725). Use a range of software, including word processing programs, to confidently create, edit and publish written and multimodal texts (ACELY1728).
- Visual Arts (for creating videos). Practise techniques and processes to enhance representation of ideas in their art-making (ACAVAM121).

Alignment with the Australian Curriculum

ICT Capability elements covered

- Creating with ICT
- Communicating with ICT
  - > collaborate, share and exchange
  - > understand computer mediated communications
- Managing and operating ICT

Other general capabilities covered

- Literacy
- Numeracy
- Critical and creative thinking
- Personal and social capability

Digital Technologies curriculum content in this module

Processes and production skills

- Analyse and visualise data using a range of software to create information, and use structured data to model objects or events (ACTDIP026)
- Define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints (ACTDIP027)
- Design the user experience of a digital system, generating, evaluating and communicating alternative designs (ACTDIP028)
- Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032)

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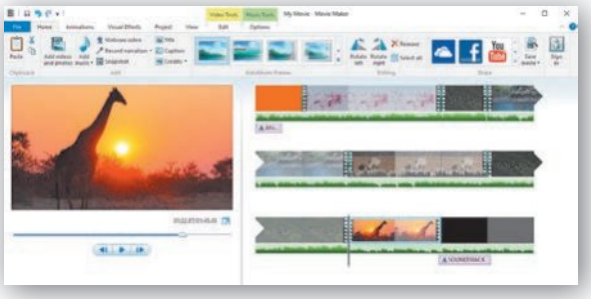
5.1 Getting started



These days it is very easy to record movie files on digital camcorders, cameras or mobile phones. Movies can be made by combining several video files together, or simply using a collection of photos, or a combination of both. Audio tracks can be added as well as transition and visual effects between movies and photos. You can also use Windows Movie Maker to edit clips, trimming and deleting sections as well as splitting clips.

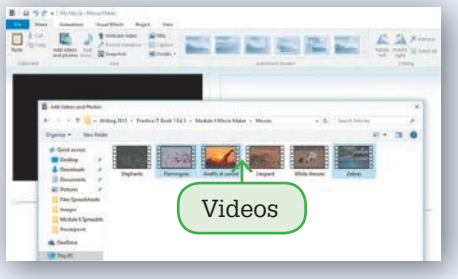
In this module you will learn the basic skills to make a movie. There is a lot more you can do with a movie project but this will get you started.

Making movies exercise 1

Start a movie project: Import movie files

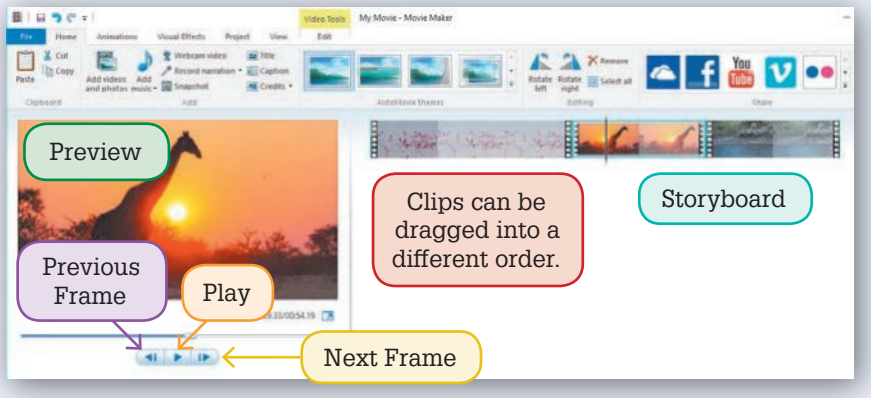
Skills practised
- Navigating Movie Maker
- Creating a new project
- Importing media
- Using the preview pane

1 **START** the application **WINDOWS MOVIE MAKER**.
2 Click on the tab **FILE** then **NEW PROJECT** in the ribbon.
3 Click on the tab **FILE** then **SAVE PROJECT** in the ribbon.
4 Check with your teacher where to save this file as movie files are quite large and you may not be able to store them in your usual folder. Save the project with the name: My First Movie (followed by your initials).
5 The first step in your project is to import files to use. These files may be video, photos or audio. Click on **ADD VIDEOS AND PHOTOS** on the **HOME** tab.
6 Locate the movies you want to import. The examples here are just for demonstration. Click on the first movie file, then hold down the <Ctrl> key and click on any other files you want to import. Click on the **OPEN** button.



The Video clips are put straight onto the storyboard. You can rearrange the order if you need to. A small preview is available to the left or you can view it in full screen mode.

7 To play an imported clip, simply click on it and click on the **PLAY** button in the **PREVIEW** pane.



To add more videos or photos just click on the button **ADD VIDEOS AND PHOTOS** on the **HOME** tab and open more to add in. You can put the clips in the order that you want them just by dragging them around the storyboard.

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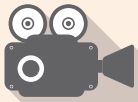
5.2 Adding transitions

Making movies exercise 2

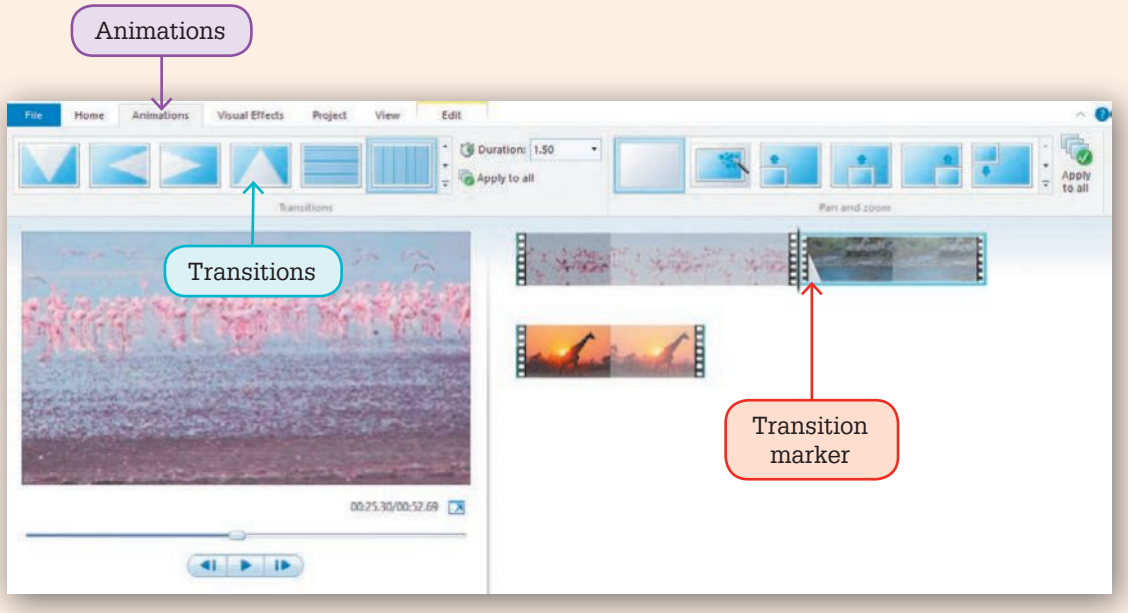


Skills practised
- Adding transitions
- Adding pan and zoom effects

Add transitions

You can add a transition between each clip.

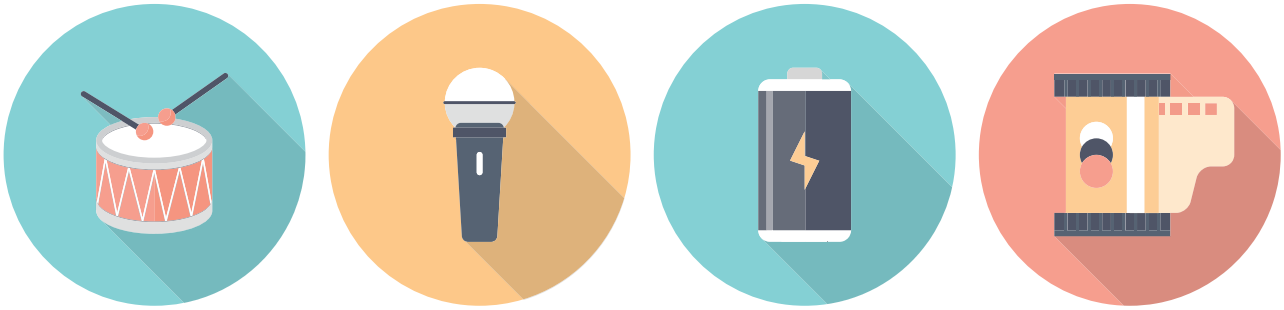
1 Click at the start of the clip to which you want to apply the transition.
2 Click on the **ANIMATIONS** tab and click on the **TRANSITIONS** box and scroll through and choose an effect. A range of transition effects are displayed.
3 Click on the **PLAY** button in the **PREVIEW** pane to view the effects of the transitions.



Add pan and zoom

The **PAN AND ZOOM** feature can also be used to apply subtle effects to the video or photo.

1 Click on one of the clips and select a **PAN AND ZOOM** effect on the **ANIMATIONS** tab.
2 Click on the **PLAY** button in the **PREVIEW** pane to view the effect.
3 More than one effect can be applied to a clip. They can be removed again simply by clicking on **NONE** in the relevant box.



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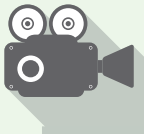
5.3 Adding titles and credits

Making movies exercise 3

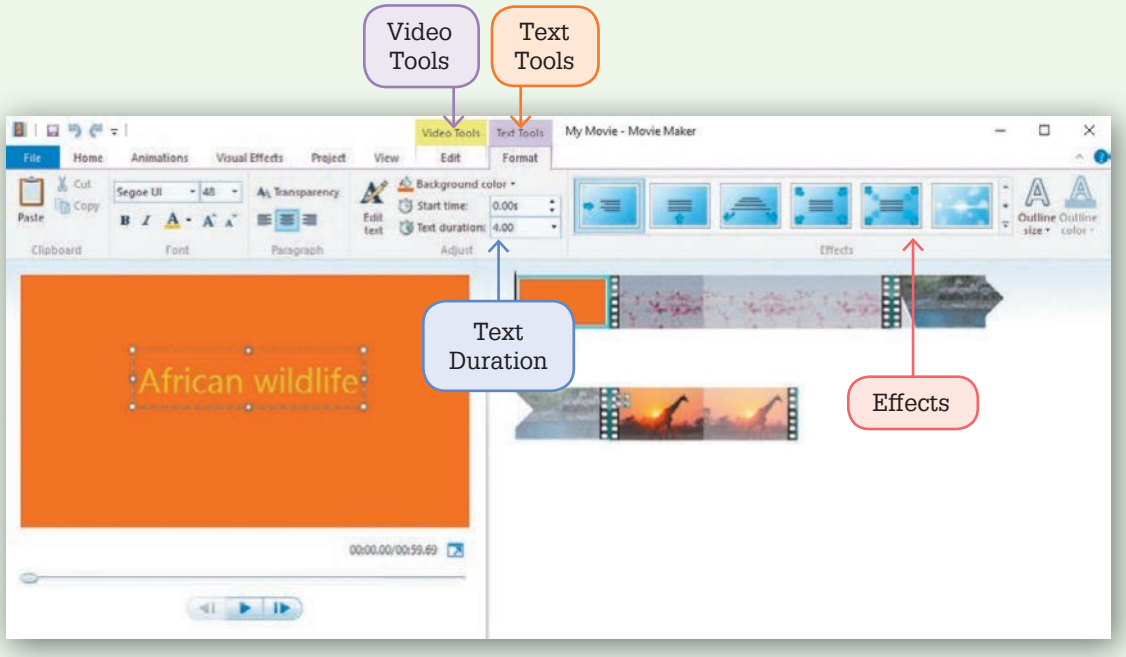
Add titles, credits and captions to movie clips



Skill practised
- Adding text

Title slides can be inserted at various places in the movie: at the start of the movie, within it before a specific clip, over a clip and at the end of the movie.

1 Click at the start of the clips to create a main title.
2 Click on the tab **HOME** then **TITLE** in the ribbon. A Title Clip will be inserted at the start of the project. It is automatically seven seconds long with text displayed for seven seconds. Note that the **TEXT TOOLS** tab is displayed.
3 Click in the text box for the title and enter the text as you want it to appear – in this example it is `African wildlife`.
4 Click on the **BACKGROUND** button and apply another colour.
5 Modify the font size, style and colour to your own design.
6 Click on the **TEXT DURATION** and reduce the time so it is less than seven seconds – this is how long the text appears while the Title clip is displayed.
7 Click on one of the **EFFECTS** to add some animation.
8 Click on the **VIDEO TOOLS** tab and click on the **DURATION** option and change to six seconds to reduce the time the Title Clip runs for.



9 Click on **PLAY** to check how the title appears. Make any modifications you think are necessary.
10 Repeat the process from steps 1 to 8 to add **CREDITS** at the end – you could add a music credit using this text as we will add it later in our example video: Bach Prelude in C Major.

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5.4 Editing the movie

Making movies exercise 4

Edit the movie with Trim and Split

Skills practised
- Video editing
- Trimming video clips
- Splitting video clips

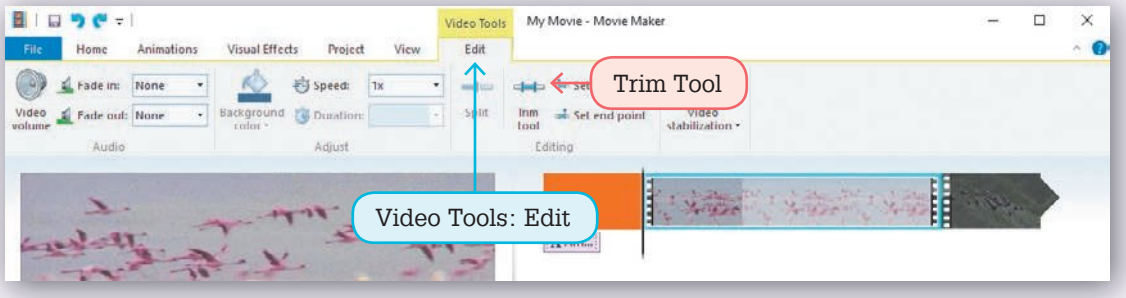
You make adjustments to the length of each clip using the **TRIM** feature. You can also **SPLIT** a clip into two pieces so one part can be moved to a different location and you can switch back and forth between scenes.

Using the Trim tool

1 Click on the clip to be edited. It is encased in a border that is used to trim the video at either end.

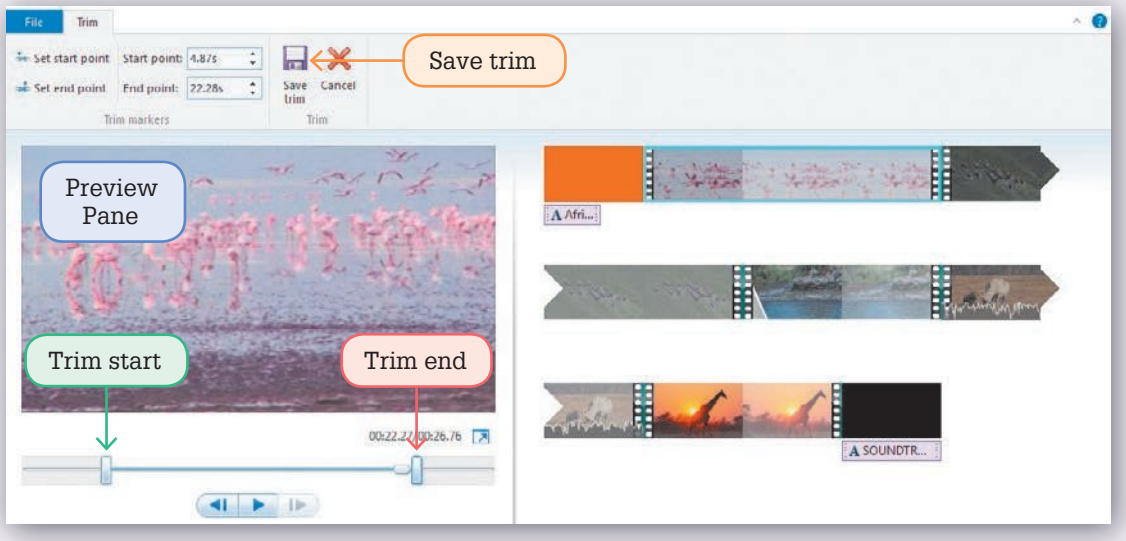
2 Click on the **VIDEO TOOLS: EDIT** tab in the ribbon.

3 Click on the **TRIM TOOL** button.



4 The Preview pane becomes an editing tool where you determine exactly how much you want to trim off either end of the clip. Click on the left marker, hold and drag in slowly, noting the frames in the Preview pane so you can choose where to release the mouse and thus trim the clip to that point. Repeat for the right-hand marker that trims off the end of the clip.

5 Click on **SAVE TRIM**. The shorter clip is indicated and the other clips are automatically adjusted along the timeline.



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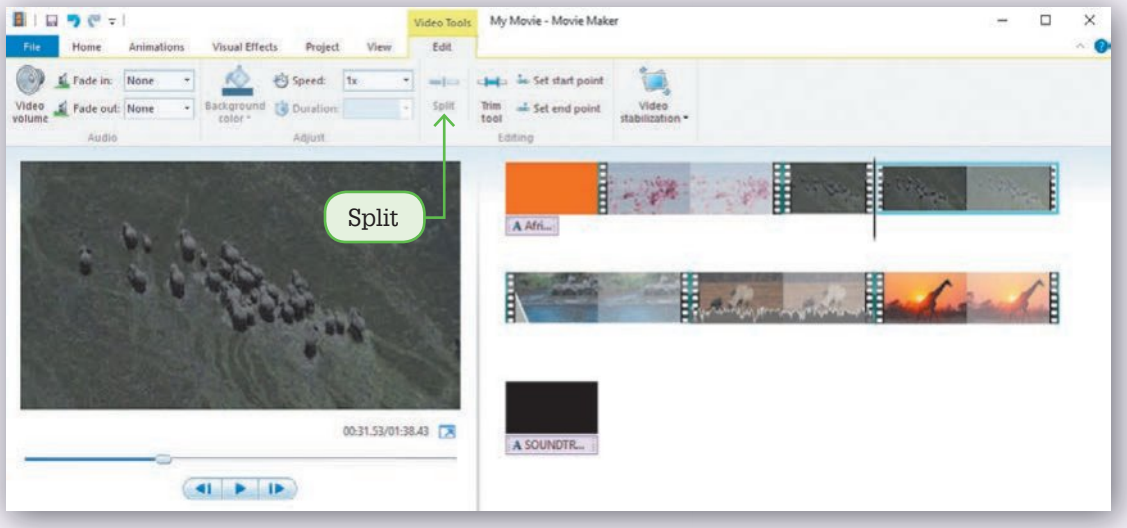
Using the Split tool

The Split tool splits a clip into two parts. You determine where the split will happen before you make the split.

1 Click in the middle of the clip to be split in two – the example below shows the 'Elephant' clip split in two.
2 Drag the marker to the point where you want to split it in two.
3 Click on the **SPLIT** button.
4 Drag the second piece of the clip to later in the project.



5 Split some of the other clips if you want to.
6 Save your work so far.

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5.5 Adding a soundtrack

Making movies exercise 5

Add and modify audio

Skills practised
- Adding and modifying audio
- Importing audio files

It is a very long time since silent movies became 'talkies'. It is now very easy to add audio files to movies. You may also need to adjust existing sound on a clip.

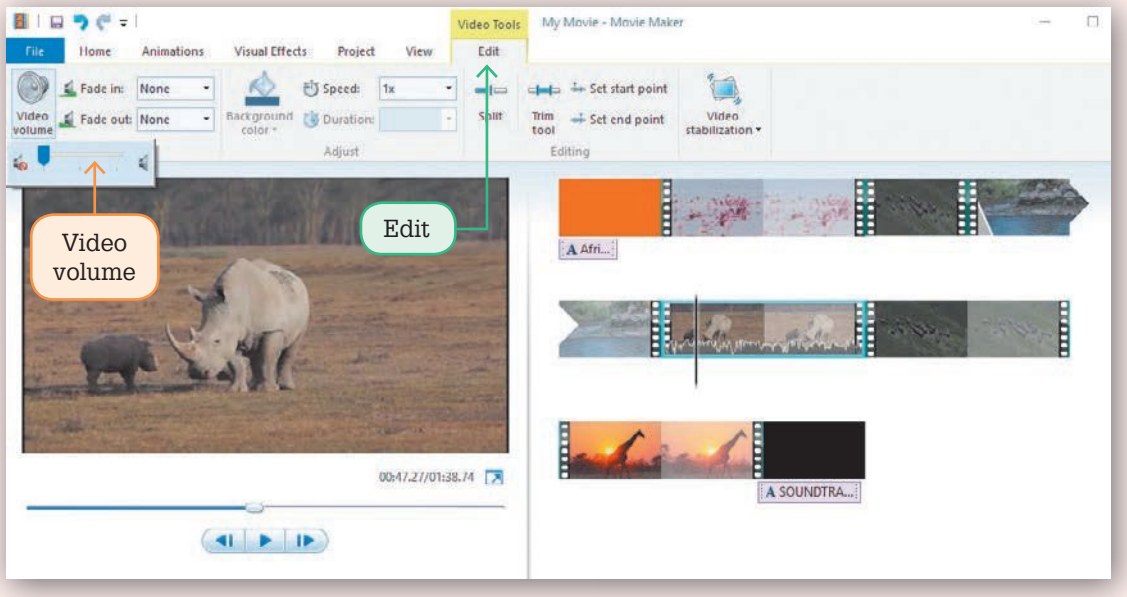
Modify audio within clip

1 With your My First Movie project displayed on the screen, click on the **HOME** tab and click on **ADD VIDEOS AND PHOTOS** and add a new video clip to your project. For our example we will use a clip called White Rhino. This clip already has sound attached, which we want to silence so it doesn't interfere with other sound that we add to the project.

2 Click on the new clip with sound to select it.

3 Click on the **EDIT** tab and the **VIDEO VOLUME** button.

4 Drag the volume button to the far left so the sound on this clip is now mute.



Import audio file

One or more audio files can be attached to the project. You can specify exactly when the audio plays. The audio can also be faded in and out to help merge two different audio tracks together.

1 Click on the **HOME** tab and click at the start of the project storyboard.

2 Click on **ADD MUSIC** and an audio file of your choice. We have used a classical music file titled Bach Prelude in C Major. The **AUDIO** file is indicated running along under the video clips of the project.

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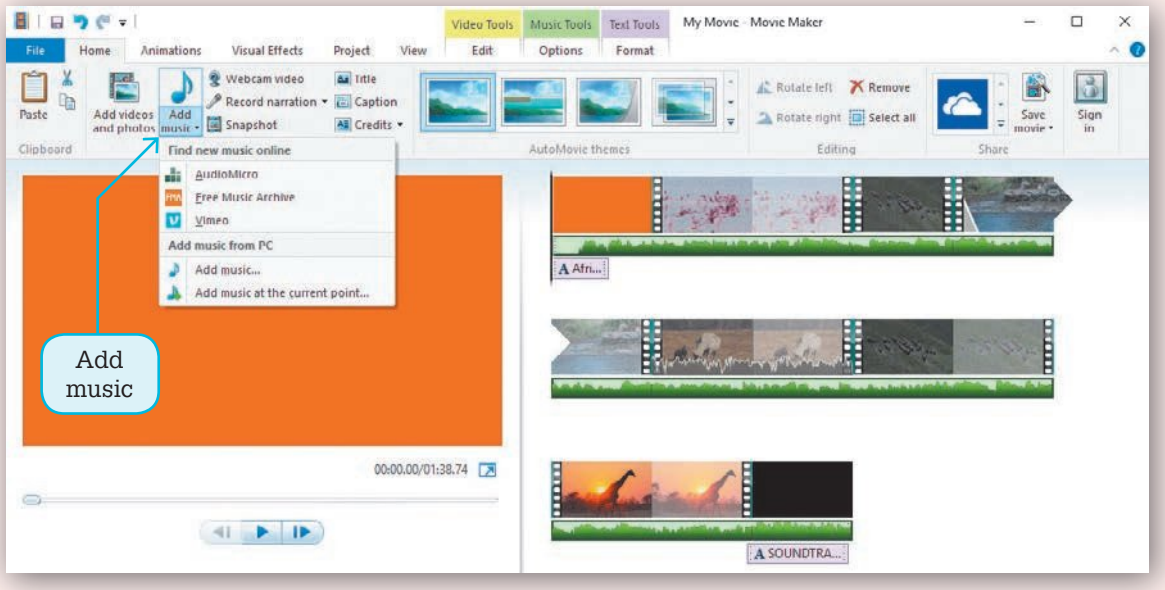
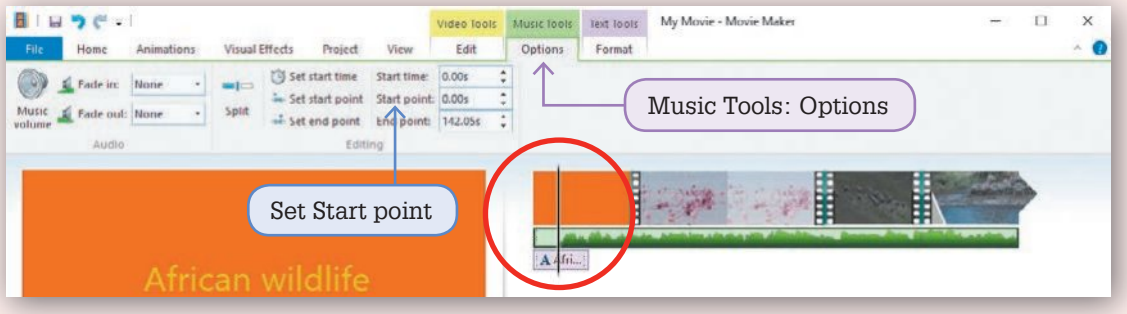


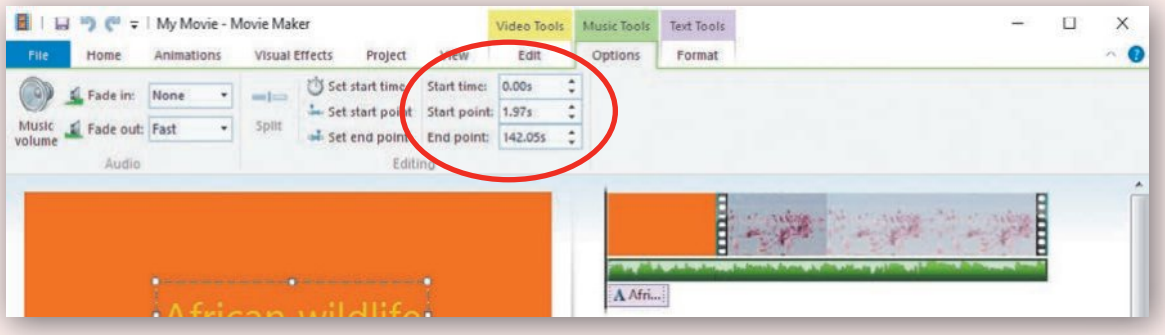
Audio clips will only play while there are movie clips playing or photos and credits displayed. Once that pictorial part is finished the audio stops playing.

3 With the music clip selected, click on the **MUSIC TOOLS: OPTIONS** tab in the ribbon.

4 Drag the marker out to where the audio actually starts and click on **SET START POINT**. The **START TIME** is the point in the **MOVIE** project where the audio clip starts.



The **START POINT** is the point in the **AUDIO** clip where it starts to play. The **END POINT** is the point in the **AUDIO** clip where it starts playing.



5 You can also add more clips throughout the project in the same way that you add video clips. When you determine where you want to start the second audio clip to start, you should shorten the first audio clip to that point first. Then add the second audio clip.

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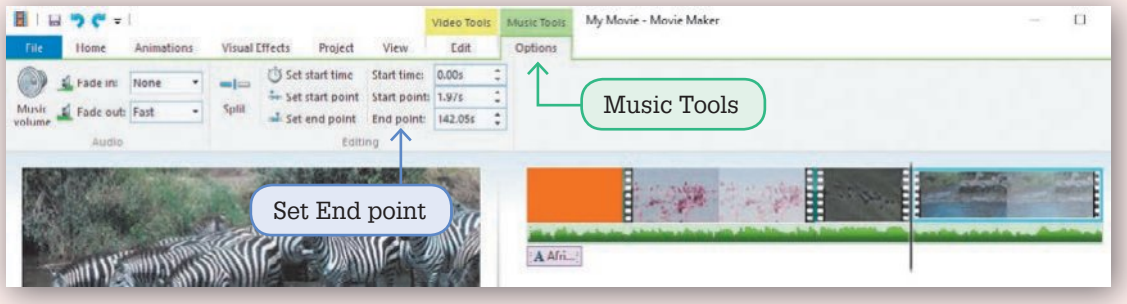
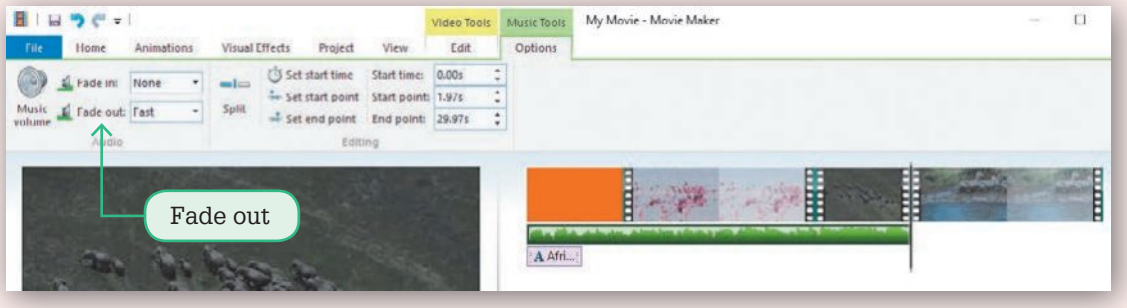
6 Click on the project at the start of the Zebras clip – or a clip further into the movie.
7 Click on the **MUSIC TOOLS** tab and click on **SET END POINT**.



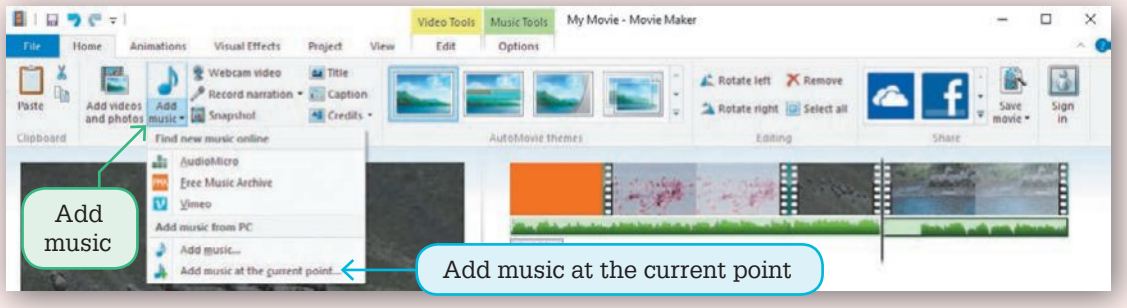
8 Click on **FADE OUT** and click on **FAST**. You can see that the audio clip is shorter now.



9 You can also use the up and down arrows for **START POINT** and **END POINT** to finely adjust where one audio clip starts and finishes.

Add audio at specific point

1 Check that the marker is still at the start of the Zebra clip – at the end of the first audio clip.
2 Click on the **HOME** tab and the lower part of the **ADD MUSIC** button.
3 Click on the option **ADD MUSIC AT THE CURRENT POINT**.
4 OPEN another audio file. We are using one titled Chaplin the Peace Patrol. This audio clip also has some silence at the start of it.



5 With the music clip selected, click on the **MUSIC TOOLS: OPTIONS** tab in the ribbon.
6 Drag the marker out to where the audio actually starts and click on **SET START POINT**.
7 Set **FADE IN** and **FADE OUT** to **MEDIUM**.

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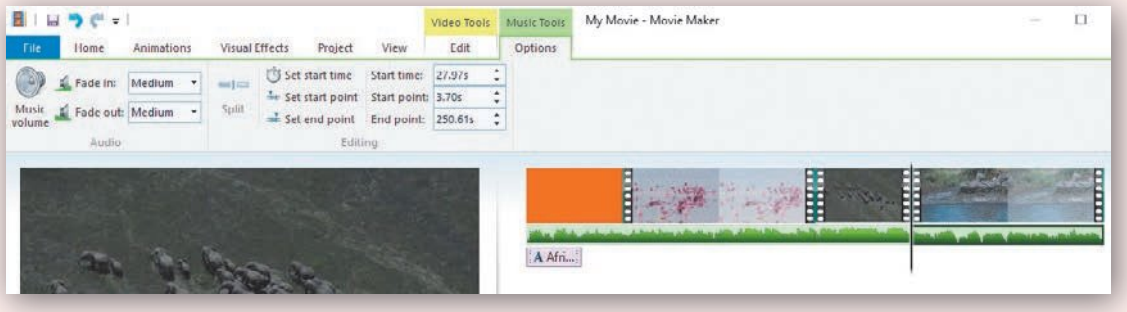


8 Repeat to add a different audio clip at the start of the last video clip in the project.

9 Save your work.

5.6 Finalising the movie

Making movies exercise 6

Test and finalise the project

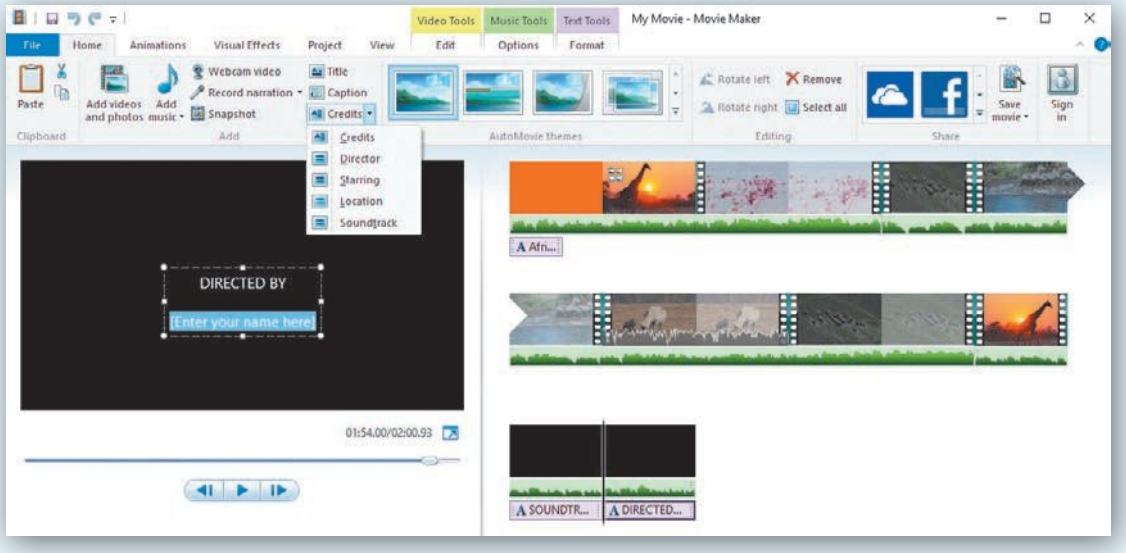
Skills practised
- Finalising the video
- Adding credits

Before publishing your movie you should test it and review it. Does it look and sound how you want it to? For example, you may want to alter the credits. You may want to add a photo or text at the end rather than just the black screen. You could add a photo at the start as a subtitle. Once you do this you will need to adjust the audio tracks.

Edit the movie – add director and stars

1 Click on the **HOME** tab and click on the **CREDITS** droplist button and click on **DIRECTOR**.

2 Type your name as the director in the text box.



3 Repeat to add the **CREDIT** of **STARRING** – add in the text shown.

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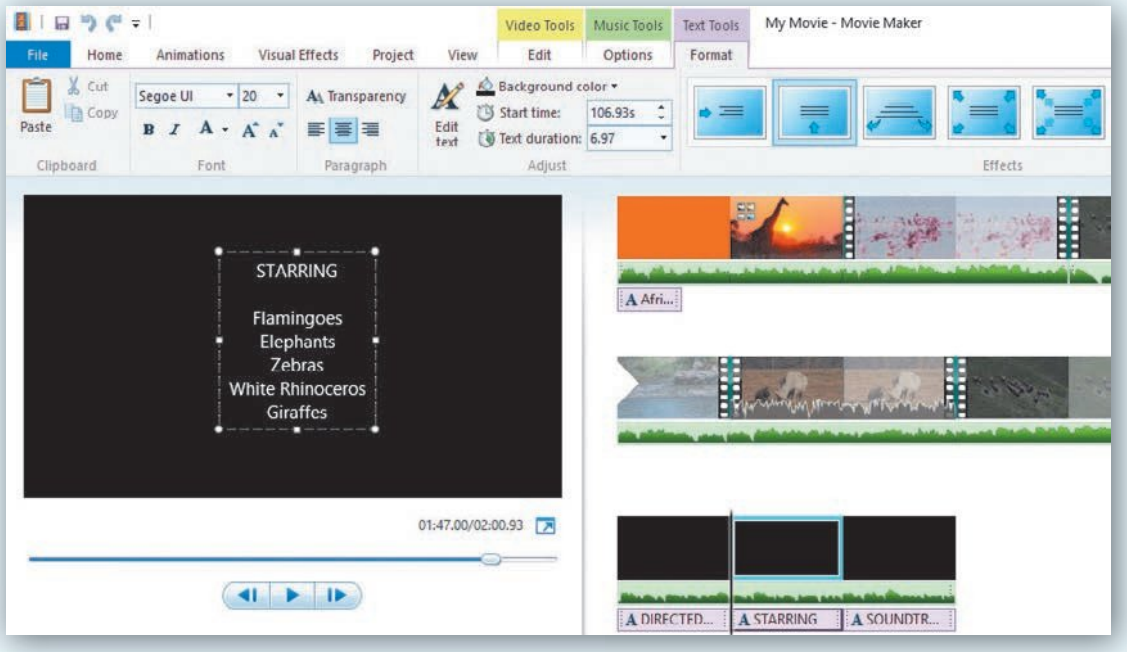
4 Drag the credits into the right order by selecting then dragging the clip.



5 Click at the start of the credits and click the **PREVIEW** button to check how they look.

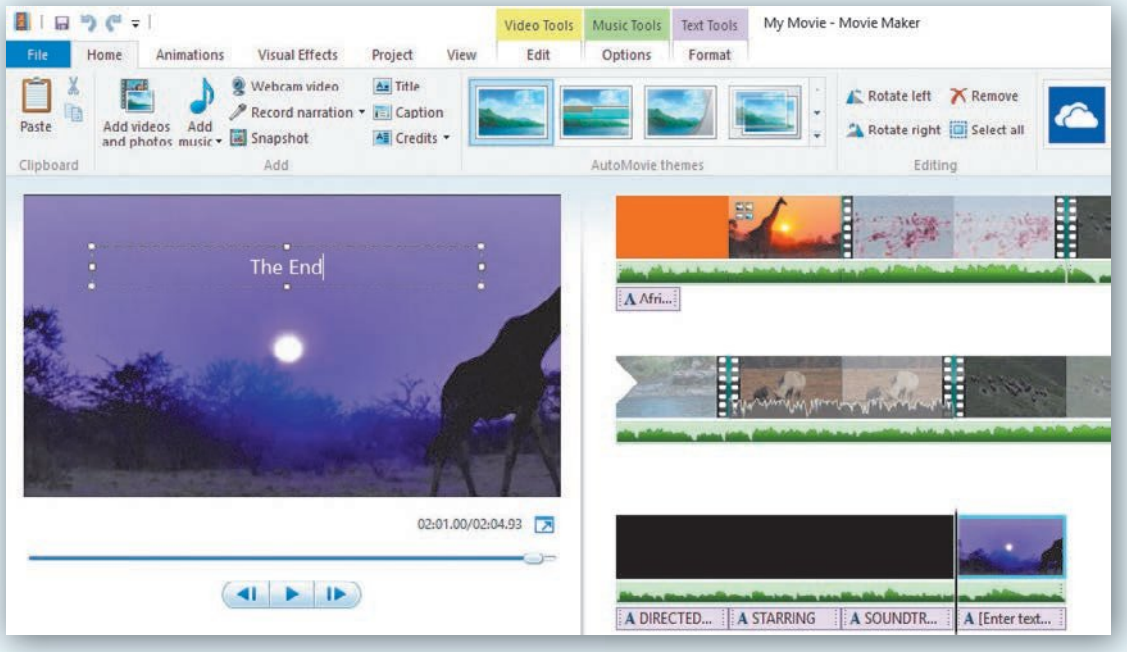
Edit the movie – add a photo and a caption

1 A photo will be added to the end of the movie as a closing scene. A caption will also be added to video clips. A caption is automatically set to play the whole length of the clip but you can set it to start later in the clip and not for the whole time.

2 Click on the **HOME** tab and click on **ADD VIDEOS AND PHOTOS**.

3 Open a still from your own files. We have used one of a giraffe.

4 Click on the **CAPTION** button on the **HOME** tab and type `The End`.



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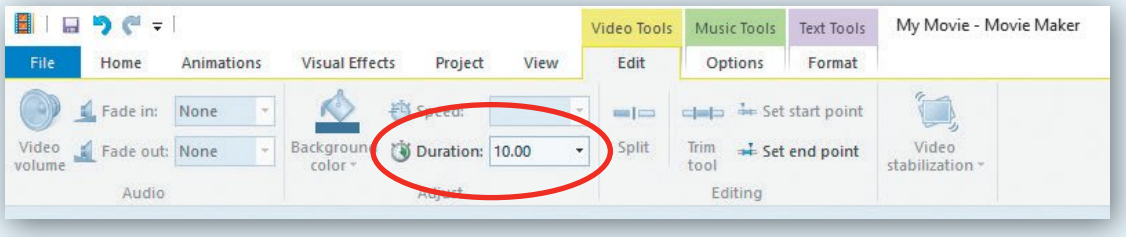
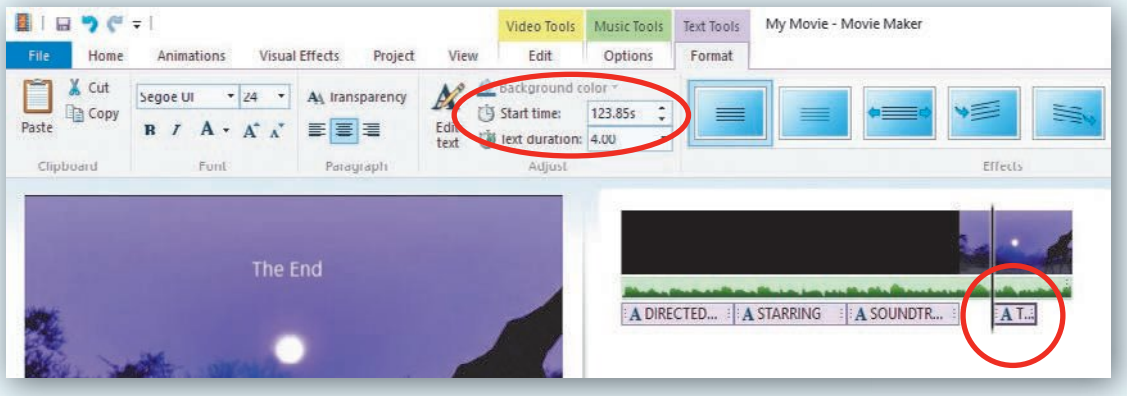
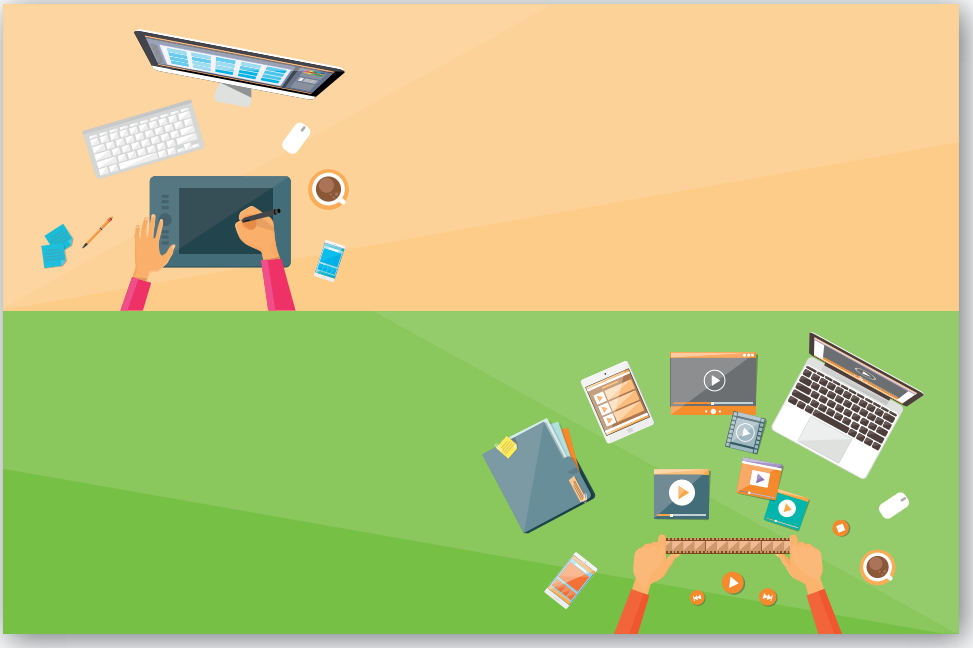
5 Click on the **VIDEO TOOLS** tab and click on **DURATION** and select 10.00.



6 Click on the **TEXT TOOLS** tab and change the **TEXT DURATION** to 4.00 and use the **UP** arrow to make the **START TIME** a few seconds later.

7 Preview and save your work.





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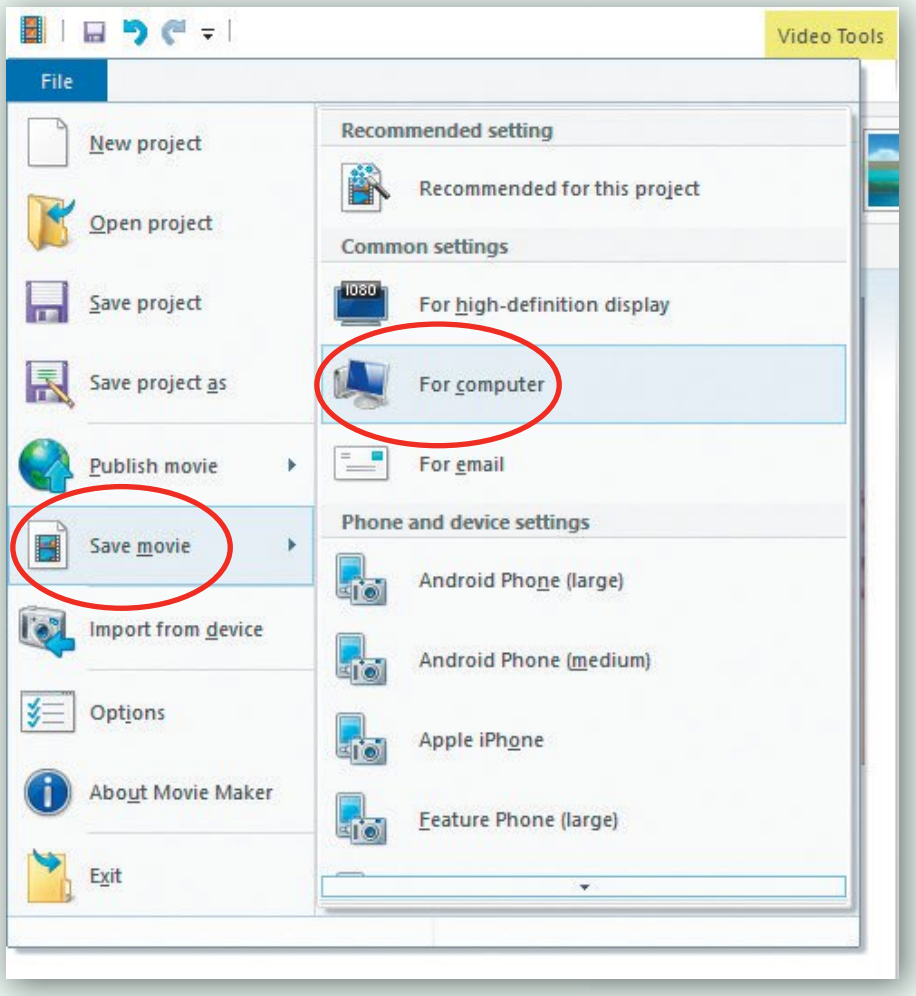
Making movies exercise 7

Export movies

Skill practised
- Exporting the movie

Once you have finished your movie, you want people to see it. You can use various formats to do this.

1 Click on **FILE** then **SAVE MOVIE** and **FOR COMPUTER**.



2 Enter a filename such as: African wildlife and a location then click on **SAVE**.

3 A prompt will appear – click on **PLAY**.

4 Select **WINDOWS MEDIA PLAYER** or **FILMS AND TV** to play the movie then **OK**. The player will load and the movie will start to play.

5 When the movie has finished playing, **CLOSE** the player.

Challenge

Add a different still photo to the start of the movie between the title and the first movie clip. Add some text, a visual effect to the photo. Adjust the audio clip start and end points so that they still align with the original clips. Save this movie as: African Wildlife Take Two (for example).

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MAKING MOVIES PROJECT

Your task for this project is to create a movie based on a series of movie clips or photos about a particular theme. You can choose the theme or your teacher may set it.

Collecting the data

Decide on a theme for your movie and collect five or six movie clips to include in your movie. Check with your teacher as to where you can find the clips or how you can create them if you have the appropriate equipment such as a smartphone or digital camcorder. Some possible topics might be:

> My favourite sports
> A day at the zoo
> A day at school
> My favourite films
> A favourite advertisement on TV

Defining the solution

Draw sketches on paper to show how the movie clips will be joined together and indicate any text you are going to include.

Implementing

> Produce the movie using Windows Movie Maker:
  a Start a new project.
  b Import the clips and photos.
  c Add the clips to the storyboard.
  d Add titles to the clips.
  e Apply transitions and special effects.
  f Edit the movie as required.
  g Add a soundtrack.
> Export the movie to your computer. Check with your teacher where to store it.

Evaluating, collaborating and managing

Test the movie. Is it how you want it to be? Show it to your classmates, teacher and friends and get feedback. If adjustments are required, edit the movie project and export again.

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Module 6

MULTIMEDIA PRESENTATIONS

Programs featured for exercises:

Microsoft PowerPoint
Google Slides

Alternative exercises available online for:

Prezi

Additional exercise available online for:

Microsoft PowerPoint

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Teacher information

IT knowledge and skills covered in this module

- Creating multimedia presentations
- Entering text
- Formatting text
- Inserting graphics
- Adding slide transitions
- Animating a slide show
- Using bullet points
- Applying themes to presentations
- Using master slides
- Inserting video clips
- Creating action buttons
- Adding hyperlinks

Suggested further uses across the curriculum

- English (for creating presentations). Use a range of software, including word processing programs, to create, edit and publish texts imaginatively (ACELY1738). Use a range of software, including word processing programs, to confidently create, edit and publish written and multimodal texts (ACELY1728).
- History (for creating presentations). Use a range of communication forms (oral, graphic, written) and digital technologies (ACHHS214).
- Science (for creating presentations). Communicate ideas, findings and evidence-based solutions to problems using scientific language; and representations, using digital technologies as appropriate (ACSIS148).

Alignment with the Australian Curriculum

ICT Capability elements covered

- Investigating with ICT
  - > define and plan information searches
- Creating with ICT
- Communicating with ICT
  - > collaborate, share and exchange
  - > understand computer mediated communications
- Managing and operating ICT

Other general capabilities covered

- Literacy
- Numeracy
- Critical and creative thinking
- Personal and social capability

Digital Technologies curriculum content in this module

Processes and production skills

- Analyse and visualise data using a range of software to create information, and use structured data to model objects or events (ACTDIP026)
- Define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints (ACTDIP027)
- Design the user experience of a digital system, generating, evaluating and communicating alternative designs (ACTDIP028)
- Evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability (ACTDIP031)
- Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032)

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6.1 What is multimedia?

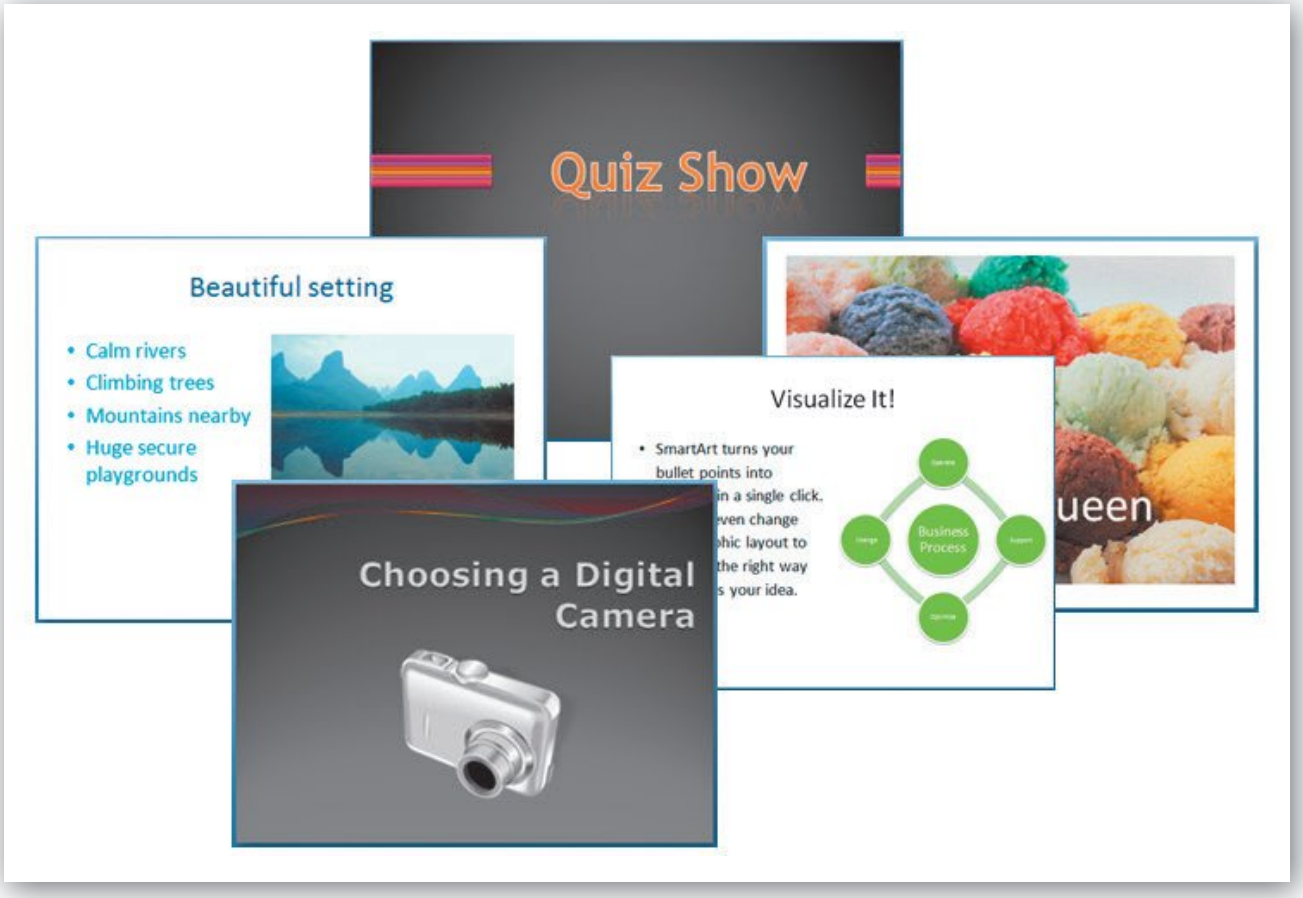
Multi means many and *media* is the type of material. Some examples of media are:

- video (moving pictures)
- audio (sound)
- print (paper)
- graphics (pictures).

Therefore, multimedia is using more than one of the media types in a presentation. The most useful feature of multimedia is that the user has some control over when each type is used. For example, the user can choose to push a button to play some music or start a movie clip. If you have ever used a computer game you will have used multimedia. Multimedia is very popular in the education, information and entertainment fields.

Microsoft PowerPoint is commonly used to create multimedia files, which will be examined in this module, in addition to some instruction also given for Google Slides.

A presentation application produces slides that you can use for slide shows, overheads or handouts. Any time you want to present information in an interesting way, a presentation application is the program to use.



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6.2 Creating a new presentation

Multimedia presentations exercise 1

Creating a new presentation

Skills practised
- Creating a new presentation
- Adding slides and text
- Saving

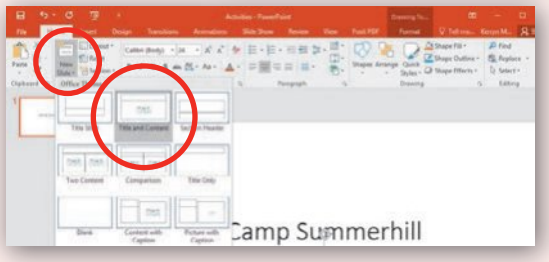
1 In Microsoft PowerPoint, click on **FILE** then **NEW** then **BLANK PRESENTATION**. (For Google Slides, click on the **HOME** page then **BLANK**.)

2 The Title Slide Layout is automatically used. You will see later how to apply a different layout. The slide layouts available are just various combinations of the objects available to PowerPoint. Some of the layouts are shown here. Content can be text, Clip Art, charts, graphics, SmartArt or other media clips. (Similar layouts are available in Google Slides.)

3 Type `Camp Summerhill` in the top placeholder then `Kids Activities` in the lower placeholder, as shown to the right.

4 Click on the **SAVE** button, access your storage disk or folder, enter the name `Activities`, click on **SAVE**.

5 In PowerPoint, click on the **NEW SLIDE** droplist arrow and click on the layout **TITLE AND CONTENT** – for the bulleted list layout – to add another slide after the first slide. In Google Slides use **ADD MORE SLIDES** then **TITLE AND BODY** layout.



6 Enter the text below for Slide No 2:

```
Canoeing
• Canoeing down calm rivers and streams
```

7 Repeat these steps to insert more new slides with the bulleted list layout, entering the text as shown:

- Slide No 3

```
Insect Studies
• Catch butterflies and other insects
• Study their form and features
```

- Slide No 4

```
Fishing
```

- Slide No 5

```
Gardening
```

- Slide No 6

```
Bowls
```

- Slide No 7

```
Football
```

8 When finished, save your work and close the file.

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6.3 Entering text

To enter text into your presentation, follow the steps below.

Multimedia presentations exercise 2

Skills practised
- Creating a new presentation
- Inserting slides
- Entering text
- Saving

Entering text

1 Create a **NEW** presentation.

2 Click on the **SAVE** button, access your storage disk or folder, enter the name `FACILITIES`, click on **SAVE**.

3 Enter the text as shown following for Slide No 1.

4 Use the **NEW SLIDE** button to add new slides with the **TITLE AND CONTENT**. For Google Slides, use **ADD MORE SLIDES** then **TITLE AND BODY** layout and enter text onto each slide as outlined below – this will be used later, so make sure you enter all the text.

- Slide No 1

  `Camp Summerhill`
  - `Facilities`
- Slide No 2

  `Beautiful setting`
  - `Calm rivers`
  - `Climbing trees`
  - `Mountains nearby`
  - `Huge secure playgrounds`
- Slide No 3

  `Food`
  - `Wide range of foods`
  - `Vegetarian`
  - `Special chef`
- Slide No 4

  `Sleeping quarters`
  - `Comfy beds`
  - `Hot showers`
  - `Private drawers and cupboards`
- Slide No 5

  `Medical care`
  - `Qualified doctor on call`
  - `24-hour nursing sister`
  - `Fully equipped nursing bay`
- Slide No 6

  `Parent contact`
  - `Telephone`
  - `Daily mail service`
  - `Sunday visits encouraged for family picnics`
- Slide No 7

  `Sporting equipment`
  - `Up-to-date equipment`

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6.4 Formatting text

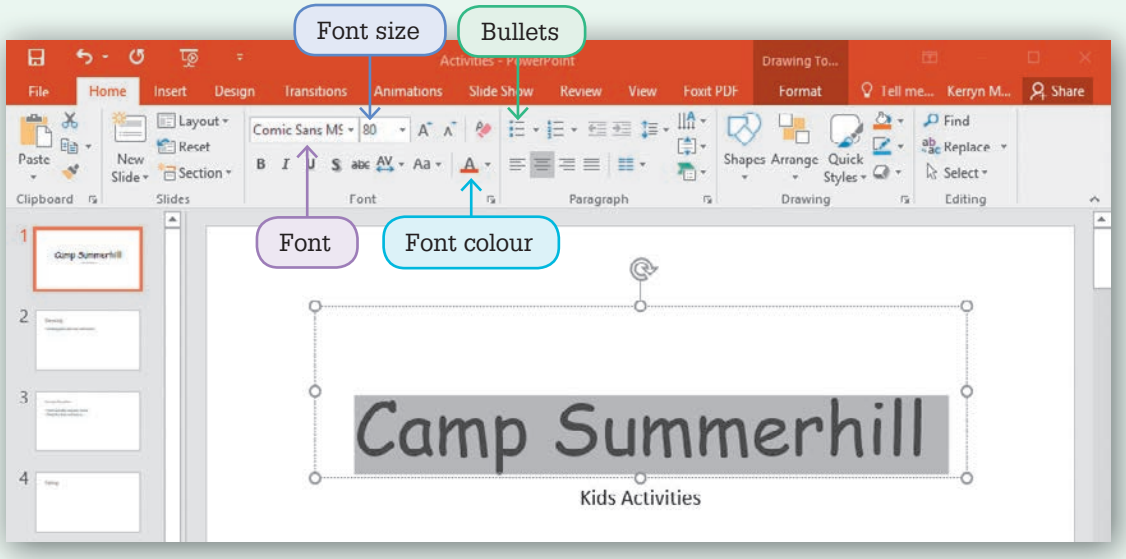
Formatting text can emphasise particular points. Formatting of text in PowerPoint or Slides is much the same as with other Microsoft programs or Google apps.

Multimedia presentations exercise 3

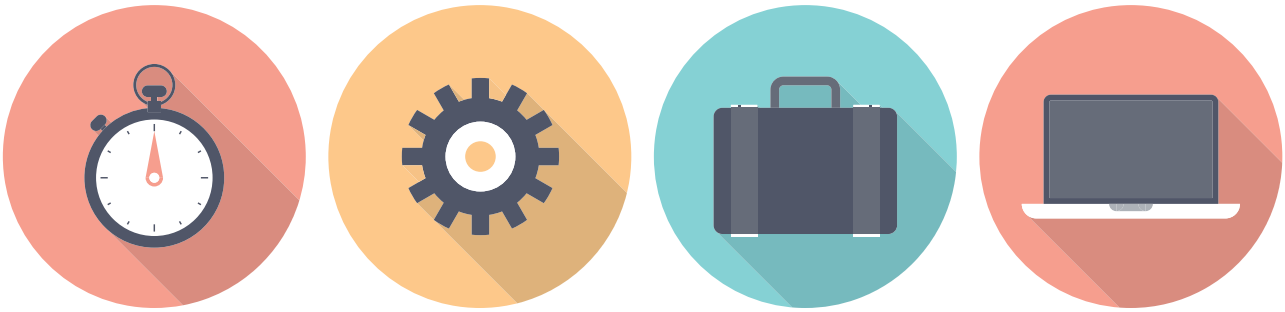
Formatting text

Skills practised
- Creating a new presentation
- Inserting slides
- Enter and format text
- Saving

1. Open or display the file Activities created in Exercise 1.
2. Highlight the slide title text.
3. Click on the droplist arrow of the **FONT** box.
4. Click on the desired font.
5. Click on the **FONT SIZE** box and scroll to the desired size and click.
6. Experiment with other buttons such as **FONT COLOUR** on the **HOME** ribbon shown below and format the headings as shown in the slides displayed in the next exercise.



For Google Slides, text in the body layout does not have bullets applied automatically as they are in PowerPoint. To apply bullets, just highlight the text and click on the **BULLETS** button in the toolbar. You may have to click on the **MORE** button first to display it.



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6.5 Inserting graphics

Clip Art and images can be inserted onto any slide, not just slides that have the specific Clip Art layout.

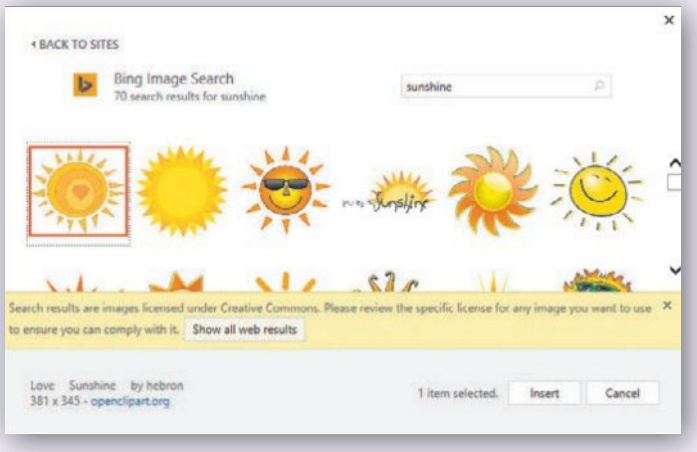
Multimedia presentations exercise 4

Inserting graphics

Skills practised
- Creating a new presentation
- Inserting slides
- Inserting images
- Saving

1 Check that the file Activities (created in Exercise 1) is displayed.
2 Display the slide that is to have the Clip Art or image added.
3 Click on the tab **INSERT** then **ONLINE PICTURES**.
4 Enter a search term in the **SEARCH** box then click on the **SEARCH** button to display the possible choices.
5 Click on the image you want to use then **INSERT**. The image will be put onto the slide currently selected.

For Google Slides, click on the **IMAGE** button then the **SEARCH** tab. Type `Sunshine` in the **SEARCH** box then click on the **SEARCH** button. When you find an image you want to use, click on it to select it then click on **SELECT**.



6 Drag the object to an appropriate location and resize it if necessary.
7 **INSERT** an image on each slide that is appropriate for the subject.
8 Save and close the file.

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6.6 Consolidate your skills

Now you can create a presentation with text and graphics.

Multimedia presentations exercise 5

Starting from scratch

Skills practised
- Creating a new presentation
- Inserting slides
- Inserting images
- Modifying layouts
- Running a slide show
- Saving

1 Create a new **BLANK** file and **SAVE** it as: Cinemania.
2 Add **NEW SLIDES** and enter the text shown below.
3 **INSERT** images into the slides – choose your own or use the following examples.
4 Format the text.
5 Change the layout and position of text and images by dragging and resizing.

6 Click on the **SLIDE SHOW** tab then **FROM BEGINNING** to run the slide show. For Google Slides, click on the menu **VIEW** then **PRESENT** – this will open a new window; close it when you are finished.

7 Click the mouse or tap to move from slide to slide.
8 **SAVE** and **CLOSE** the file.

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Multimedia presentations exercise 6

More graphics

Skills practised
- Inserting images
- Saving

1 **OPEN** or display the file you created in Exercise 2 called Facilities.
2 Insert images onto each slide to illustrate the points – be creative, you don't have to use exactly what is displayed here.
3 Save and close the file.

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6.7 Slide transitions

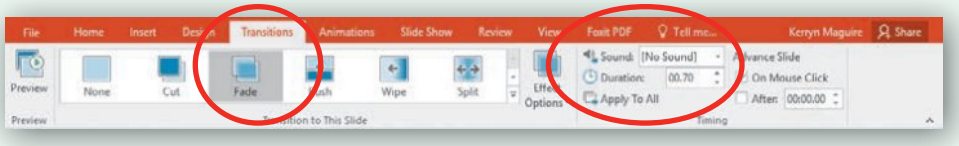
A slide transition is the way we move from one slide to the next in a slide show. For example, one slide may fade out to the sides as the next appears. Microsoft PowerPoint has more than 50 varieties of transitions. Google Slides has six transitions.

Multimedia presentations exercise 7

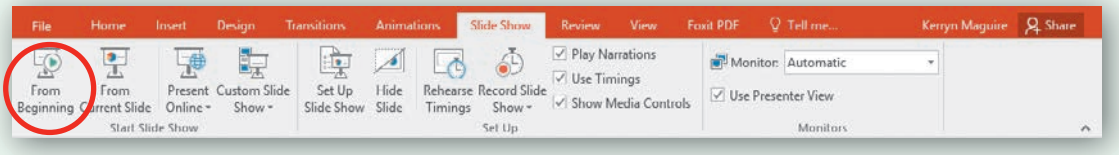
Slide transitions

Skills practised
- Creating a new presentation
- Applying transitions
- Saving

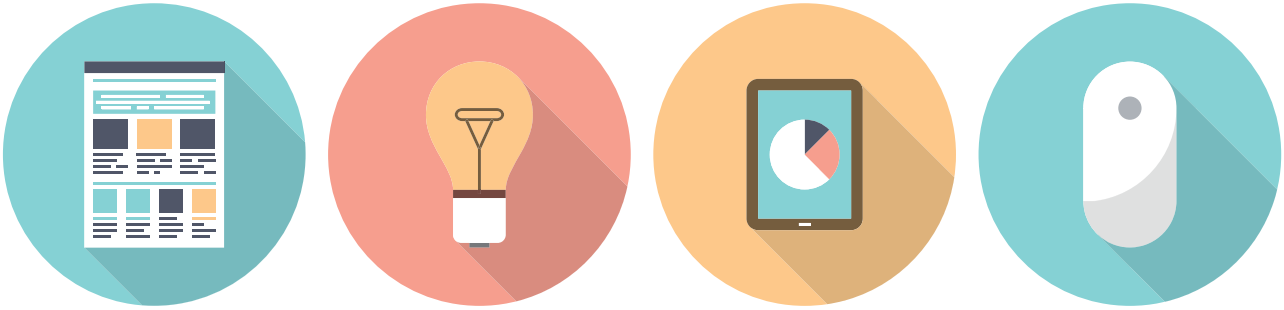
1 Open the file called Activities.
2 Display the first slide.
3 Click on the **TRANSITIONS** tab in the ribbon. Move the mouse over each of the transition effects for a preview of how the transition will look.



4 Click on the **FADE** transition effect or another of your choice. A preview of how the transition works is immediately displayed.
5 Click on **DURATION** and select a time – this is how quickly the transition will occur – 0.5 is quite fast.
6 Click on **SOUND** and click on **EXPLOSION** – this is the sound that will play. For Google Slides, click on **TRANSITION** in the menu bar to display the **TRANSITION PANE**. Select a **TRANSITION** such as **FADE**. Click on **PLAY** to test how it looks. Click on **STOP** to return to the normal view.
7 Display the next slide and repeat steps 4 to 6, but using different transition effects.
8 Click on the tab **SLIDE SHOW** then **FROM BEGINNING** to run the slide show from the beginning to check the transition effects – click the mouse to display each slide and so activate the transitions.



9 Save and close the file.
10 Open other presentations you have created and apply slide transitions to them.



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6.8 Animating slides for a slide show

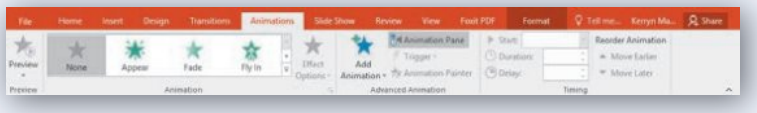
Animating a slide is when the text or Clip Art or other objects on the slide are activated to move around or change in some way. PowerPoint has many different animation effects.

Multimedia presentations exercise 8

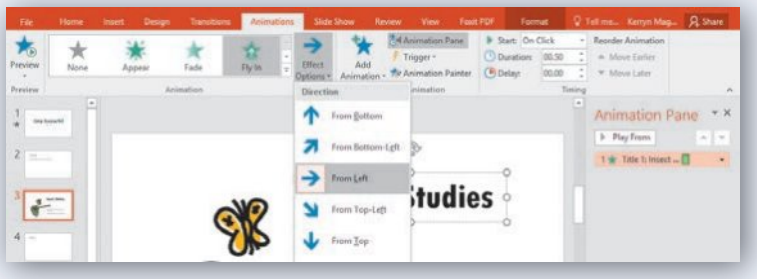
Animating slides for a slide show

Skills practised
- Applying animation
- Saving

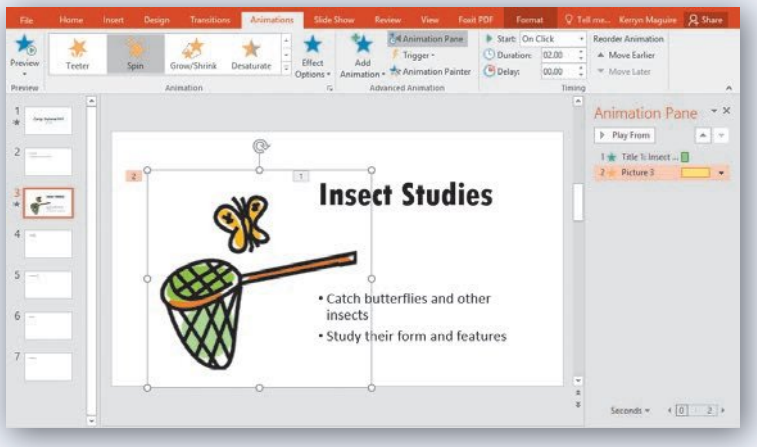
1 **OPEN** the file called Activities.
2 Display the slide titled Insect studies.
3 Click on the **ANIMATIONS** tab and click on the **ANIMATION PANE** button. This box enables you to choose which element is to be animated, in what order and how.
4 Select the **TITLE PLACEHOLDER**.
5 You have several choices on the method of appearance. Click on an Animation effect such as Fly in.



6 Click on the droplist button for **EFFECT OPTIONS** and click on **FROM LEFT**. Click on the droplist button for **DURATION** and click on 0.5, which is very fast. As you make your selections, the effect will be displayed on the slide.



7 Experiment with the options then click on **PREVIEW** in the ribbon.
8 Other elements of the slide can also be automated. Click on the **IMAGE** object to select it.
9 Scroll through and click on **SPIN** in the Animations box.



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Building bullets

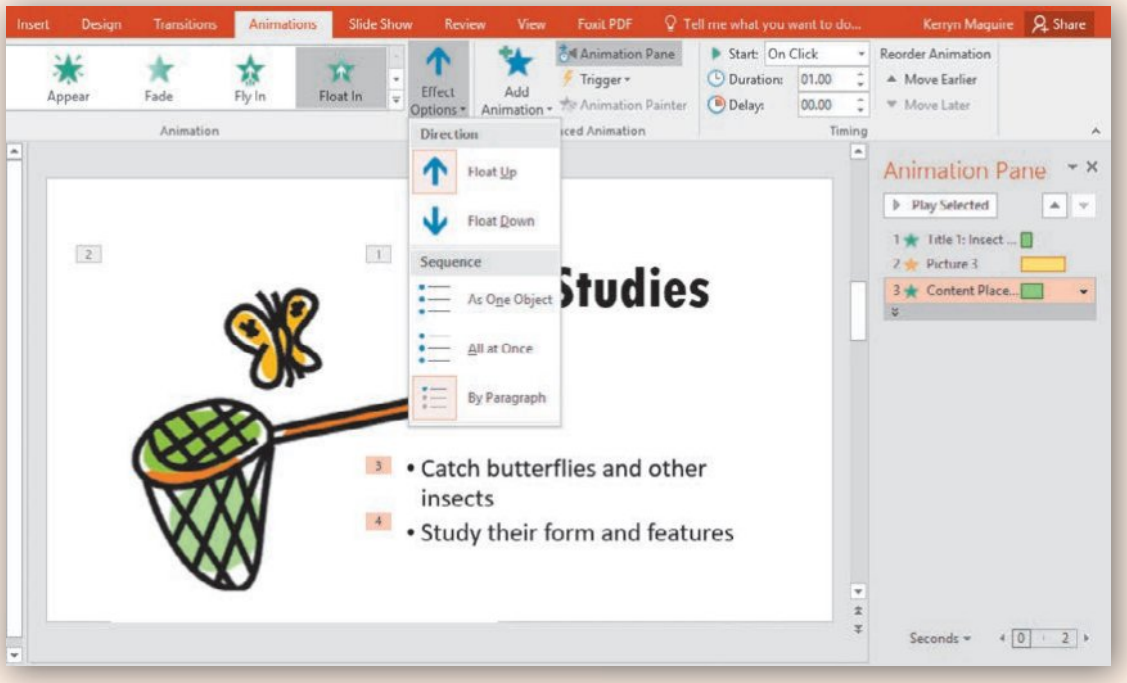
Bullets can be set to build one line at a time on the screen. This is particularly useful for adding impact to each point.

Multimedia presentations exercise 9

Building bullets

Skills practised
- Applying animation
- Saving

1 Click on placeholder for the bulleted list.
2 Click on **FLOAT IN** in the **ANIMATIONS** box.
3 Click on **EFFECT OPTIONS** on the **ANIMATIONS** tab.
4 Click on the **DIRECTION** option then the **SEQUENCE** option.
5 Click on the **PREVIEW** button to check the effect. Notice that a 3 and 4 appear next to each point in the list even though you have only applied one effect. This indicates that when the slide show is run, each bullet will only appear on a click of the mouse by the user, thus the list of bullets is built on screen. For Google Slides, click on **TRANSITION** in the menu bar to display the **TRANSITION PANE** if it isn't already displayed. Select the object then click on **ADD ANIMATION**. Select a **TRANSITION** such as **FADE**. Click on **PLAY** to test how it looks. Click on **STOP** to return to the normal view.



6 Apply **ANIMATIONS** to the other slides in the presentation.
7 Save and close.

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6.9 Using themes and masters

When you first create a presentation it is very easy to get carried away with all the great things you can do. The danger in this is that others looking at the slide show become distracted with all the effects and the message can be lost. Most presentation applications supply Themes that help you apply a consistent look to each slide throughout the presentation. You can also customise or create your own Theme by modifying the Master design. The purpose of setting a master background is so that each slide has a standard look. When you create master slides, you use formatting, drawing tools, graphics and automatic fields such as slide number or date.

In Exercises 11 to 16 you will create a master for a school camp report. You will:

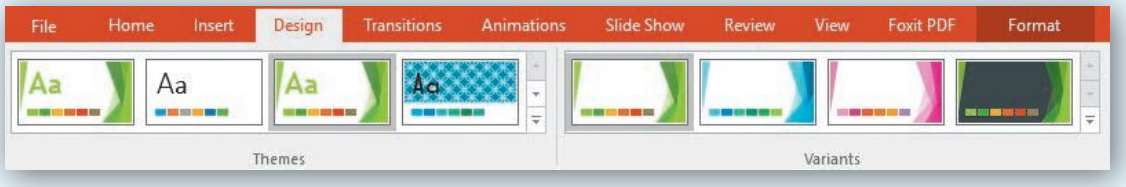
- apply a background
- insert a page number
- insert a footer along the bottom border that has the name of the school camp
- insert an image such as a tent in the top left corner.

Multimedia presentations exercise 10

Apply a theme

Skills practised
- Creating a new presentation
- Viewing a slide master
- Formatting text

1. Start a **NEW** presentation and **SAVE** it as: Practice design.
2. On the **TITLE** slide, enter the text: `My Design`.
3. Click on the **DESIGN** tab and click on one of the **THEMES** – this is not necessary to create your own Master but it will highlight how changes to the Master change the design of a presentation. For Google Slides, click on **THEMES** in the menu bar and choose one from the **THEMES PANE**.



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Multimedia presentations exercise 11

Using masters

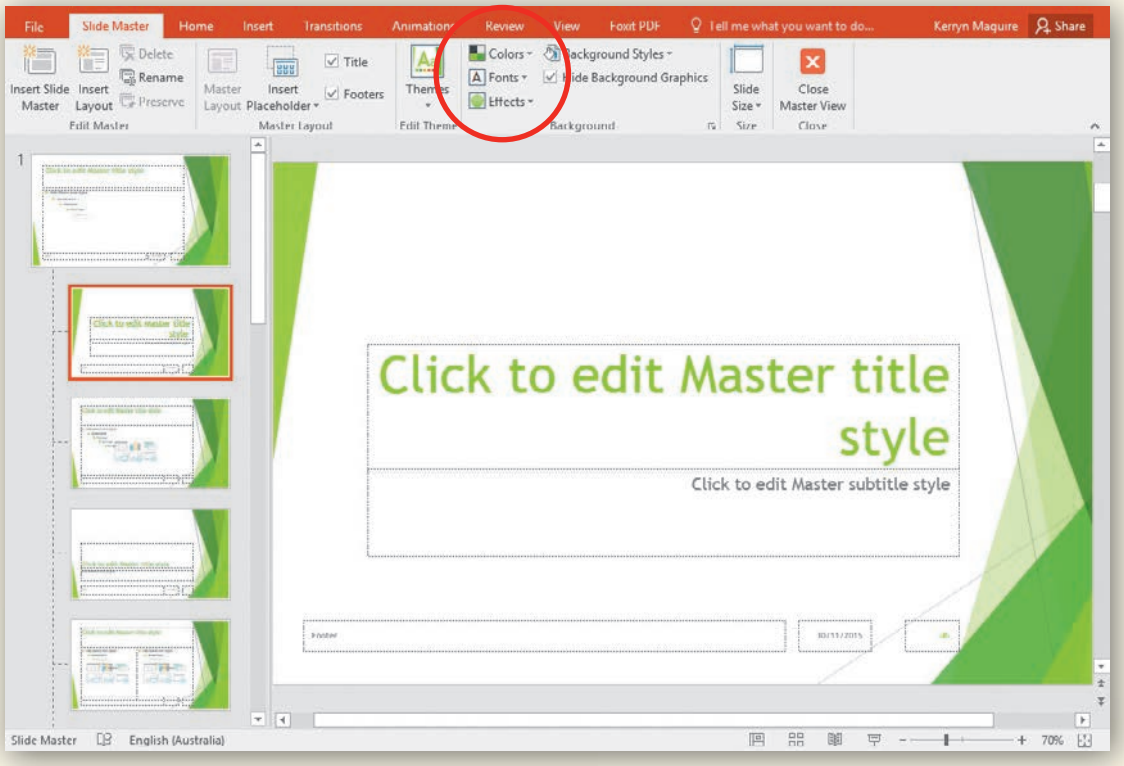
Skills practised
- Viewing master layout
- Adding background objects
- Adjusting objects

There are three different Master views: Slide Master, Handout Master and Notes Master.

1 Display the presentation from the previous exercise.

2 Click on the **VIEW** tab then **SLIDE MASTER**.

3 Click on each of the slide layout thumbnails in the pane to the left. The presentation will appear in **SLIDE MASTER VIEW** as shown below. The Slide Master is divided into two distinct areas, the **MASTER TITLE** style and a **MASTER TEXT** style. The Master title and Master text control the way the title and text will appear on all your slides in slide view and all the slide layouts. For example, if you change the font to Arial and Italic for the title, this is the way the title text will initially be formatted on each slide and each slide layout.



Formatting the master text

1 Click on the **SLIDE MASTER** at the top of the set. This determines the text and other formats globally on the theme.

2 Highlight the text in the **MASTER TITLE** style placeholder.

3 Format using the **FONTS** button in the **BACKGROUND** group on the **SLIDE MASTER** ribbon.

4 Click **CLOSE MASTER VIEW**.

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Formatting master bullets

Bullets are used in text lists to emphasise items. The bullets currently used for this slide are displayed next to each level of text. PowerPoint has a huge range of bullets that can be selected from.

Adding background items

Background items appear on all slides. Background items are:

- date and time
- text footers
- slide numbers
- pictures
- shapes
- graphic watermarks.

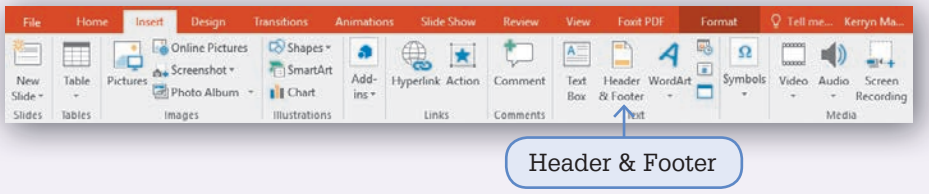
You can insert a Footer, Date and Time and Slide numbers without being in Master view. However, you must be in Master view to format them to be the same on each slide.

Multimedia presentations exercise 12

Adding background items

Skills practised
- Adding background items
- Adding slide numbers
- Adding footers
- Adding date and time

1 Click on the **INSERT** tab then click on the **HEADER & FOOTER** button. The background items can be activated in the **HEADER & FOOTER** dialog box. For Google Slides, the items will be entered separately, as outlined below.



Adding a slide number

1 With the **HEADER & FOOTER** dialog box displayed, click into the **SLIDE NUMBER** check box.

2 Click on **APPLY TO ALL**. For Google Slides, click on **INSERT** then **SLIDE NUMBERS** and check that **ON** is selected. Also click on **SKIP TITLE SLIDES** so a tick appears.

Adding a footer

1 Click on the **HEADER & FOOTER** button again.

2 Click on the **FOOTER** option so a tick appears.

3 Type `Hilltop School Camps` or some text of your own in the **FOOTER** box. For Google Slides, click on **INSERT** then **TEXT BOX**. Type `Hilltop School Camps` in the text box. This will appear on all slide layouts. If you do not want it on the Title Slide then you have to enter the text box separately on each of the layouts in the Master, except for the Title Slide layout, which is tedious but it does work. You can just do a copy and paste to speed things up.

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Don't show background items on title slide

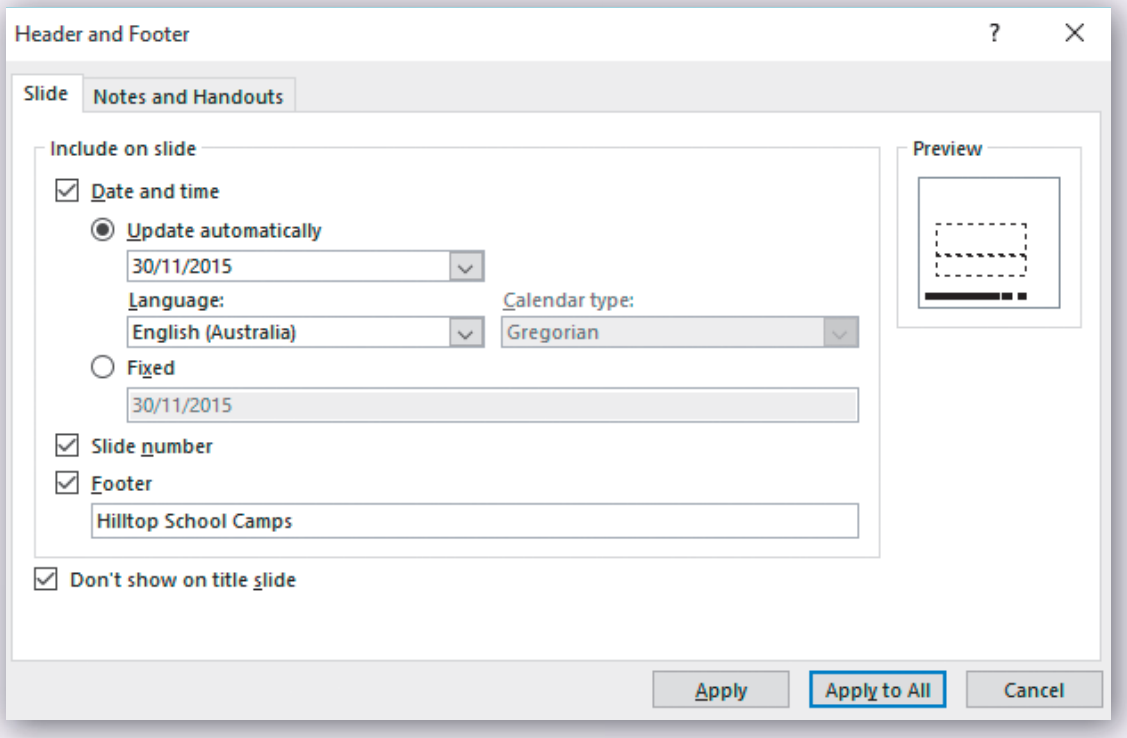
Often you do not want the background items to appear on the title slide.

1 Click on the **DON'T SHOW ON TITLE SLIDE** so a tick appears.
2 Click on **APPLY TO ALL**.

Adding the date and time

There is a choice with date and time of inserting a fixed date or inserting a date that is automatically updated to the current time. This feature is not available in Google Slides. You could enter a fixed date in the same way footer text is added.

1 In the Master view, click on **HEADER & FOOTER** on the **INSERT** tab in the ribbon.
2 Click into the **DATE & TIME** check box so a tick appears.
3 Click on the **FIXED** option and enter a date in the box.
4 Or if you want the date to update automatically, click on the **UPDATE AUTOMATICALLY** box and click on the droplist button to select the format for the date.
5 Click on **APPLY TO ALL**.
6 Click **CLOSE MASTER VIEW**.



7 The date, page numbers and footer will show up on the slide view if you have more than one slide. Add another slide so you have at least two slides.

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Adding a picture to a master

Any picture or logo can be put on the slide master to appear on each slide. This must be done in Master view.

Multimedia presentations exercise 13

Adding a picture to a master

Skills practised
- Viewing a master
- Inserting an image
- Adjusting objects

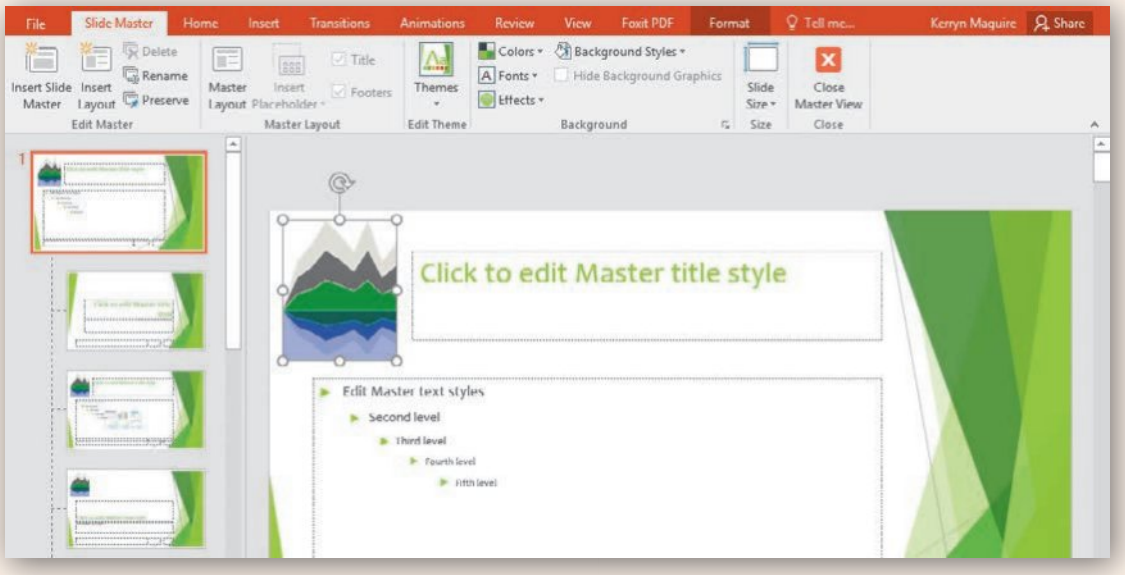
1 Click on the **VIEW** tab then the **SLIDE MASTER** in the ribbon. The slide will appear in Slide Master view. Click on the **MASTER SLIDE** in the pane to the left.

2 Click on the **INSERT** tab then click on the **PICTURES** or **ONLINE PICTURES** button.

3 Insert an image that represents a camping or mountain scene.

4 The image object will appear in the middle of the slide, so it will have to be moved. Resize and move the image and the title so they appear together at the top of the slide. Your Master should look something like the one shown below, depending on the choices you made. Notice that the image doesn't appear on the **TITLE SLIDE MASTER**. This is because it is automatic setting for **HIDE BACKGROUND GRAPHICS** to be on for the Title slide layout. You can click on that layout and turn the image on again for that layout if you want to.

5 Click on the **CLOSE MASTER VIEW** button to return to the Slide view. The features you added to the Slide Master will appear on the slides.



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Multimedia presentations exercise 14

Using the Master

Now that you have a Master background, each slide you add to the presentation will have the elements you applied.

Skills practised
- Creating a new presentation
- Applying a background
- Adding new slides
- Entering text
- Applying a master

1 Think about the last camp you attended with your school, or even a camping holiday with family or friends. Or you can simply make something up!
2 On the **TITLE** slide, give the presentation the name of the location where you camped.
3 Add three or four new slides with a **TITLE AND CONTENT** layout and use each to present information about:
   > where you stayed – location and facilities
   > what you did – excursions, etc.
   > highlights of the camp.
4 Save and close the file.

Multimedia presentations exercise 15

Movie Promo Master

The Time Warp DVD store has a permanent slide show running in the store that displays new releases. You are to create a master that can be used so that each slide has a consistent look.

Skills practised
- Creating a new presentation
- Applying a background
- Inserting footer text

1 Start a new presentation and save it in your student folder with the name: Movie Promo.
2 Apply a background.
3 Put a star in each corner.
4 Put the name of the store in the bottom footer.

Multimedia presentations exercise 16

Create a master

Develop your own design for a type of presentation. Here are some ideas:

Skill practised
- Creativity

> A new game that is to be advertised.
> An upcoming event such as a fair, school sports day or rowing regatta.

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6.10 Video clips

Inserting video clips into a presentation can add a lot of impact. Video clips can be set to play only when clicked, which adds to the interactive nature of the presentation.

Inserting a video file

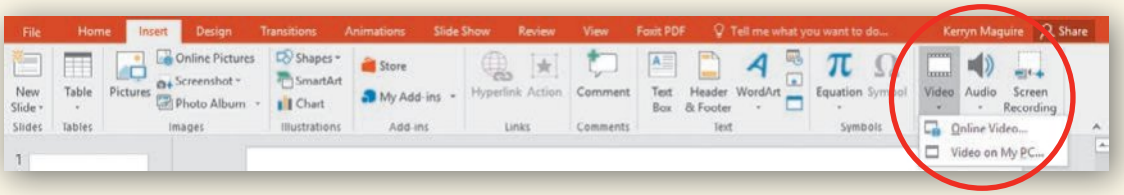
You can easily add a video file that you have recorded or downloaded from the internet or from another program. You can enter video clips into a presentation so that it runs either automatically or when selected.

Multimedia presentations exercise 17

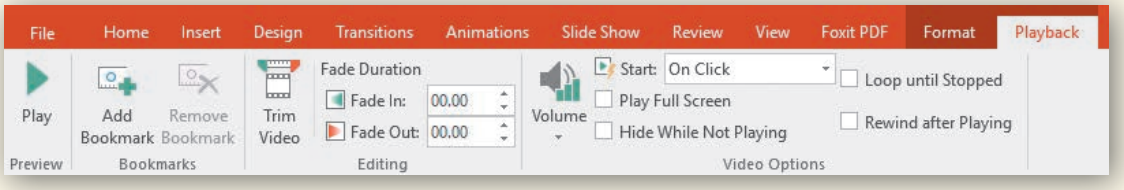
Video clips

Skills practised
- Creating a new presentation
- Entering text
- Adding a new slide
- Inserting movies
- Saving

1 Start a **NEW** blank presentation.
2 Enter the text `My videos` in the title.
3 **SAVE** the presentation in your student folder with the name: My videos.
4 **ADD** a **NEW SLIDE** with a **BLANK** layout.
5 Click on the **INSERT** tab then click on the **VIDEO** droplist button and click on **VIDEO ON MY PC**.
6 Locate the video file you want to use and click on **INSERT** or **OK**. The video clip will be inserted on the slide.



7 Click on the **PLAYBACK** tab.



8 You can also make custom settings. For example, to loop continuously while the slide is displayed. Click on the **PLAY** button in the **PLAYBACK** tab.
9 **ADD** another slide with a blank layout.
10 **INSERT** another video clip.
11 Repeat the previous two steps until you have six slides with video clips.
12 Save and close the file.

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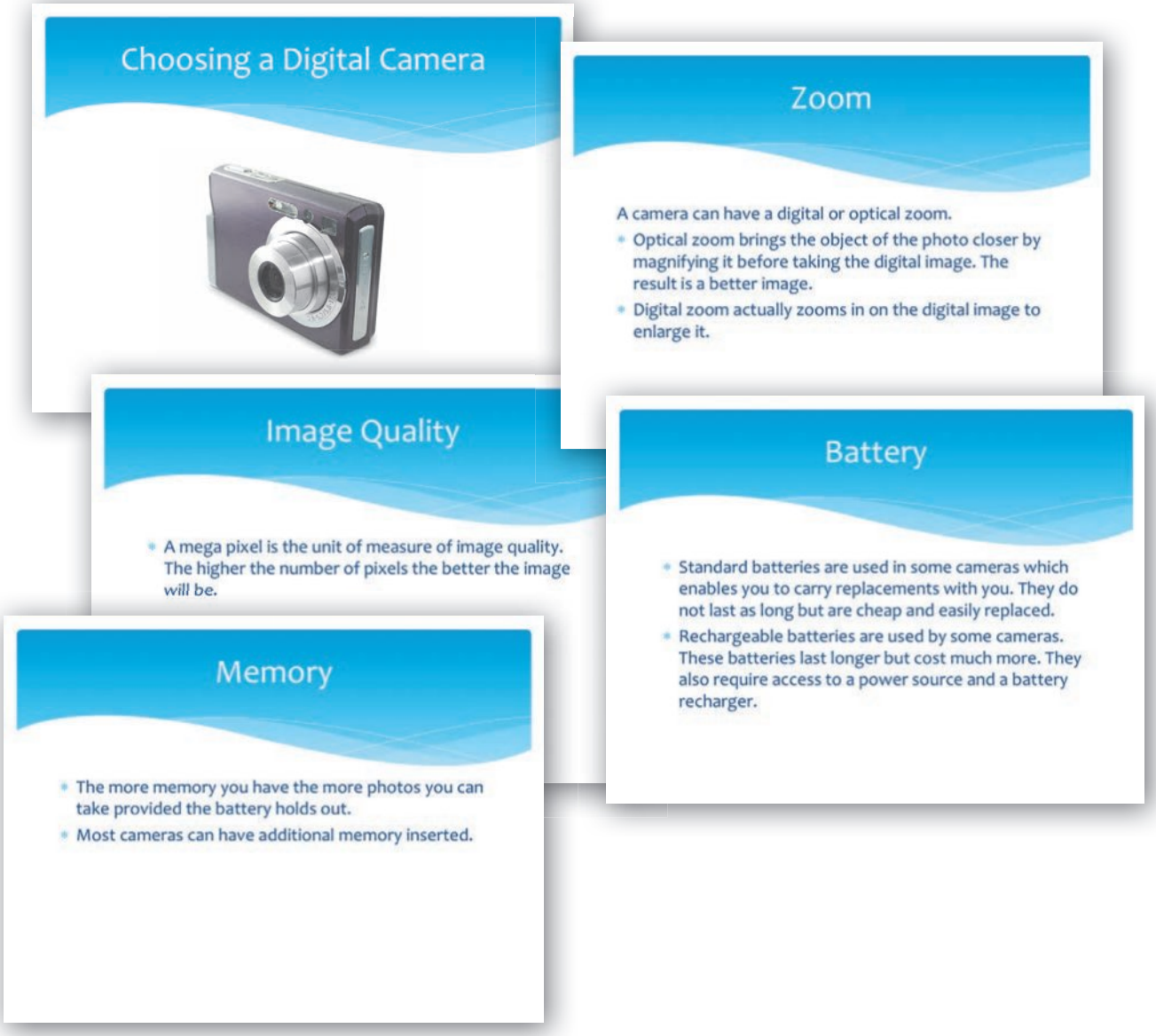
6.11 Action buttons

Action buttons can display various slides within a presentation, causing a program to start, play a sound or video, link to a webpage and so on. In a simple presentation, they can be useful for displaying a slide that may only be used in particular circumstances. You may have used some programs or help screens in the past that use a Next, Previous, Start or End button. An Action button is simply just an object with a hyperlink. Instructions for Google Slides are available on *Cambridge GO* or via the Interactive Textbook.

Action buttons are simply a method of placing navigation buttons on a slide. Before we assign action buttons we will first create a new presentation.



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Multimedia presentations exercise 18

You will create a button on each slide that enables you to go to the first, previous, next or last slide.

Skills practised
- Creating a new presentation
- Entering text
- Inserting graphics
- Inserting slides
- Applying hyperlinks to objects

1 Start a **NEW PRESENTATION** and enter the text as shown on the previous page.

2 Save the presentation as: Choosing a digital camera.

Creating action buttons

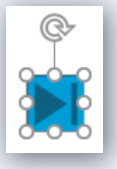
1 Create an **END** button.

a Display the second slide.

b Click on the **HOME** or **INSERT** tab then click on the **SHAPES** button. The **ACTION BUTTONS** are at the end of the Shapes list.

c Click on ACTION BUTTON: END.

d Click, hold and drag to form a small square at the lower right of the slide.



e Click on **OK**.

2 Create a **NEXT** button.

a Click on the **SHAPES** button on the **INSERT** tab.

b Click on **ACTION BUTTON: FORWARD OR NEXT**.

c Click, hold and drag to form a small square at the lower right of the slide just before the **END** button.

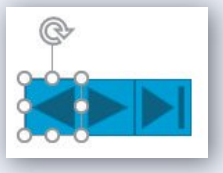
d Click on **OK**.

3 Create a **BACK** button.

a Click on the **SHAPES** button on the **INSERT** tab.

b Click on **ACTION BUTTON: BACK OR PREVIOUS**.

c Click, hold and drag to form a small square at the lower right of the slide just before the Next button.



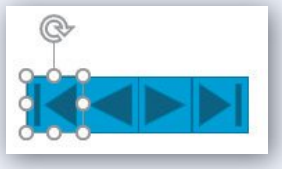
d Click on **OK**.

4 Create a **BEGINNING** button.

a Click on the **SHAPES** button on the **INSERT** tab.

b Click on **ACTION BUTTON: BEGINNING**.

c Click, hold and drag to form a small square at the lower right of the slide just before the Back button.



d Click on **OK**.

5 Repeat this process to create a set of buttons on each slide as appropriate. For example, the last slide would have only a **BEGINNING** and **PREVIOUS** button on it.

6 Test the result by running the **SLIDE SHOW** and using the action navigation buttons to move around the presentation.

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Creating a custom action button

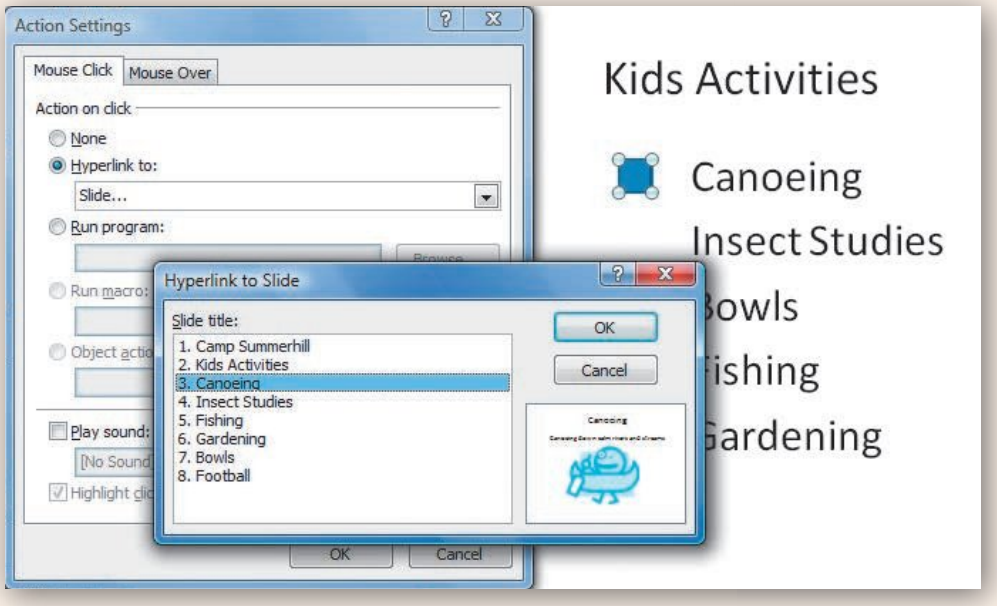
The Custom action buttons are great for creating a menu to specific slides. You will add a new slide, which will act as a menu to the remaining slides. You will create a button from the menu slide to each of the remaining slides.

Multimedia presentations exercise 19

Creating a custom action button

Skills practised
- Creating a new presentation
- Adding slides
- Inserting action buttons

1 Open the file called Activities.
2 Display the first slide.
3 Click on the **NEW SLIDE** button and choose a **TITLE AND CONTENT** layout.
4 Add the text as shown, removing the bullets and adjust the layout.
5 Click on the **INSERT** tab then the **SHAPES** button.
6 Click on **ACTION BUTTON: CUSTOM**.
7 Click, hold and drag to form a small square next to the text. The **ACTION SETTINGS** dialog box appears. Here you set what happens when the button you have just placed on the slide is clicked.
8 Click on the drop-down button for **HYPERLINK TO** and click on **SLIDE**.
9 Click on the slide, in this case 3, Canoeing, then **OK** and then **OK** again. Now, if you click on this button in the slide show, the linked slide is displayed.



10 Repeat this process to assign each of the options on the second slide to a button.
11 On each slide, create an **ACTION** that will return the user to the second slide – use the **ACTION BUTTON: CUSTOM**.
12 For each of these buttons, use the **TEXT BOX** tool on the **INSERT** tab to add the text `Return to Main Menu`.
13 Run the slide show to test your buttons.

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Multimedia presentations exercise 20

Adding more hyperlinks

1 Open the file called Facilities.
2 Add a **NEW SLIDE** after the first slide.
3 Create **ACTION BUTTONS** with hyperlinks to each slide as described in Exercise 19.

Skills practised
- Creating a new presentation
- Adding slides
- Inserting action buttons

Multimedia presentations exercise 21

Proceeding with action buttons

1 Open the file you created earlier called: My videos.
2 Create action buttons on each slide so the user can move through the slides from start to finish. However, they should also at any time be able to return to the first slide or go directly to the last slide to finish.

Skills practised
- Creating a new presentation
- Adding slides
- Inserting action buttons

A Additional multimedia presentations Exercise 22 is available in the Interactive Textbook.

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MULTIMEDIA PRESENTATIONS PROJECT 1

The Sorrento is a resort located on the Gold Coast of Australia. There are three standards of room available for two people: Supreme – $200 per night; Deluxe – $150 per night; and Poolside – $100 per night. Facilities include a fabulous heated pool and spa with views to the ocean, fully equipped gym, valet parking, room service, laundry and a restaurant for dinner and buffet breakfast. Apart from glorious beaches, the surrounding attractions are nearby mountains, theme parks, shopping and the theatre centre. There are also day trips and activities such as snorkelling, trail riding, water skiing and markets. Room bookings can be made by contacting Hayley by telephone on (07) 5647 3333 or fax (07) 5647 4444, or email rooms@sorrento.com.au.

Your brief is to create a presentation that provides details about the motel. The motel is decorated in marine colours and white, so incorporate these into the colours of the presentation.

Gather data

Look at designs available in PowerPoint. Gather images and photos that will be used in the presentation.

Define the solution

Sketch a design of each slide on paper, including possible graphics to illustrate the slides and text that will be entered on each slide. You should plan to include:

> title slide
> menu slide
> slides on each feature of the motel – rooms, facilities, surrounding attractions, bookings
> the facilities slide could be a sub-menu that branches to each of the facilities and an explanation of each.

Implement the solution

Use the PowerPoint program to produce the solution.

Evaluating, collaborating and managing

Ask other people to look at your presentation and give you feedback on how effective it is. Summarise what was said and the changes you made to your presentation because of their comments.

A Multimedia presentations Project 2 is available in the Interactive Textbook.

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Module 7

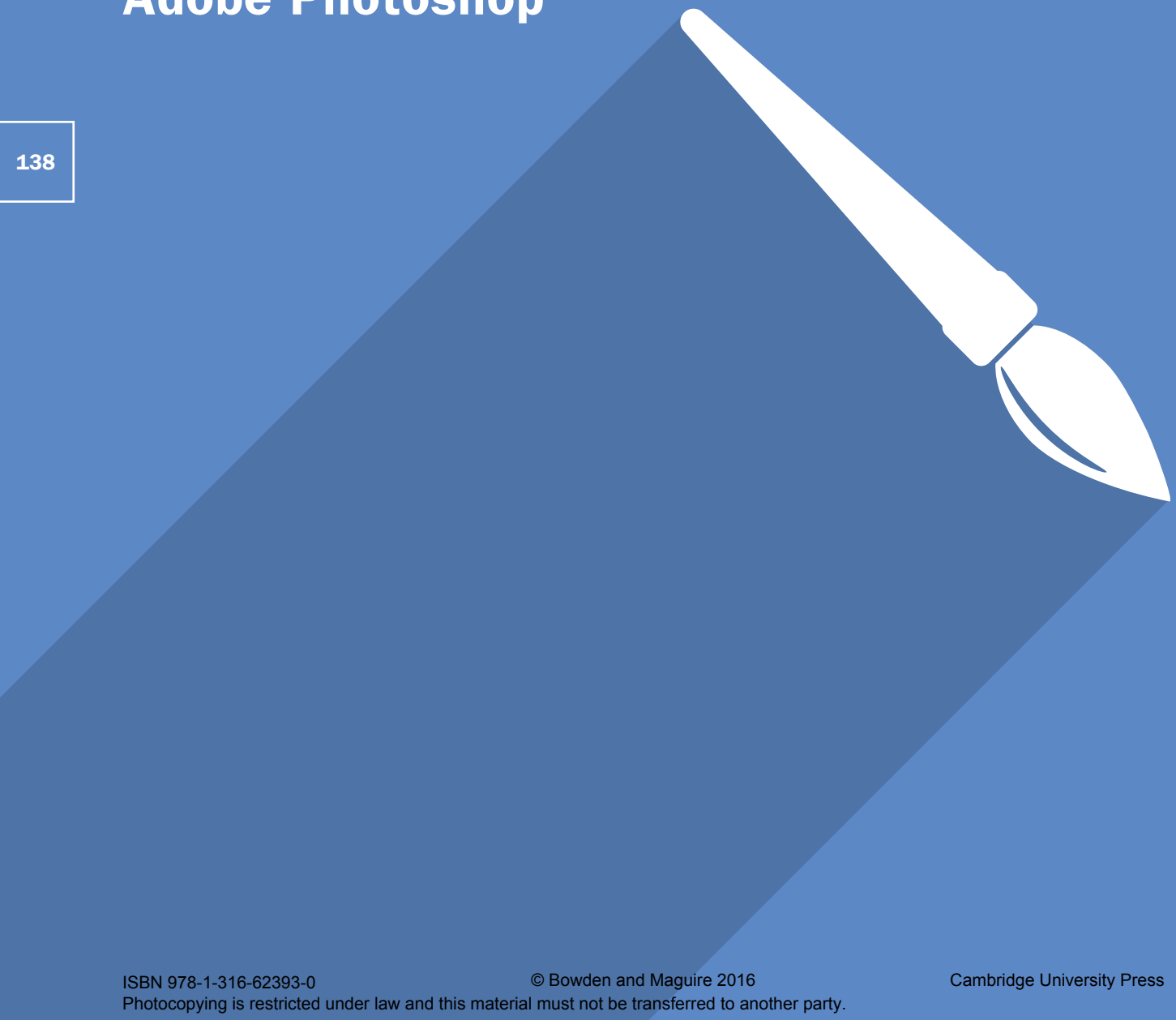
COMPUTER GRAPHICS

Programs featured for exercises:

Microsoft Paint
Adobe Photoshop

Additional instructions for Exercises 1 and 2 online for:

Adobe Photoshop



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Teacher information

IT knowledge and skills covered in this module

- Different types of graphics projects
- Creating a new project
- Creating a detailed image
- Copying and pasting graphics
- Editing graphics
- Selecting, rotating, flipping, distorting and resizing images
- Editing photos with Adobe Photoshop
- Photo-editing tools
- Special effects
- Adding text to images

Suggested further uses across the curriculum

- Visual Arts (for creating detailed images). Practise techniques and processes to enhance representation of ideas in their art-making (ACAVAM121).

Alignment with the Australian Curriculum

ICT Capability elements covered

- Creating with ICT
- Communicating with ICT
  - collaborate, share and exchange
  - understand computer mediated communications
- Managing and operating ICT

Other general capabilities covered

- Critical and creative thinking
- Personal and social capability

Digital Technologies curriculum content in this module

Processes and production skills

- Define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints (ACTDIP027)
- Evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability (ACTDIP031)
- Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account (ACTDIP032)

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7.1 The different types of graphics programs

Graphics programs allow you to create your own sketches or make changes to existing sketches. There are two main types of graphics programs: bitmapped or pixel-based programs and object-oriented or vector-based programs.

Bitmapped or pixel-based programs

These are commonly called digital painting programs, and are used for artistic painting or freehand drawing. The painting is created by the program turning screen lights (called pixels) on or off or to colours. Some common pixel-based programs are Corel Painter, Microsoft Paint, Adobe Photoshop and the Painting section Adobe Fireworks. There are also numerous free online painting programs.

Object-oriented or vector-based programs

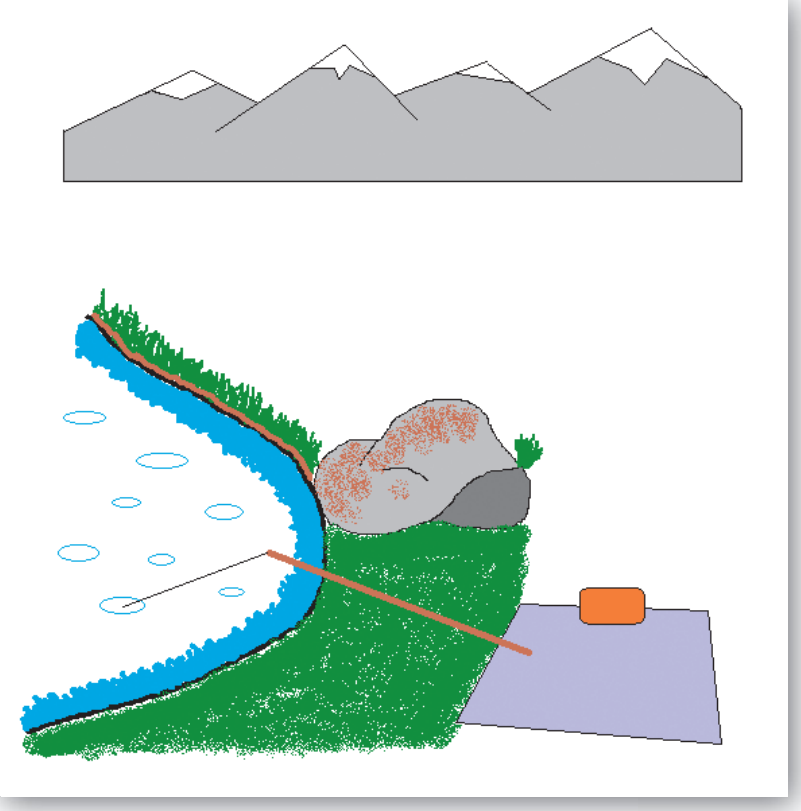
These are commonly called drawing (or computer-aided design) programs and are used when accurate measurements or files of smaller size are required. The drawing is created by drawing a series of straight lines between given points (vectors).

Drawing programs are commonly used for architectural drawing. Some common vector-based programs are Adobe Illustrator, the drawing section of Adobe Fireworks and Google Drawings. Vector-based programs usually require less file space to store their files than pixel-based programs.

In this module you will be using a pixel-based program to create and modify freehand drawings. Module 4 involved the use of the Microsoft Office Drawing Tools and Google Drawings, which used vector methods to create screen objects.

7.2 Creating a painting

In the next exercise, you will be following a set of steps to create the sketch of a fishing rod in a stream next to a rock shown below.



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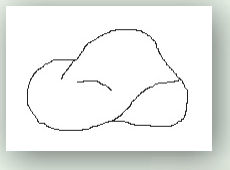
Computer graphics exercise 1

Creating a painting

Skills practised
- Drawing tools
- Filling shapes
- Spray painting

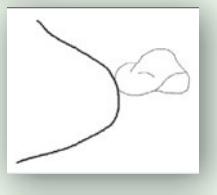
These instructions use Microsoft Paint, although other paint programs could be used. There are instructions for this exercise using Adobe Photoshop on *Cambridge GO* or via the Interactive Textbook.

1 Open your painting program and use the **PENCIL** tool to draw a rock shape near the bottom centre of the screen.

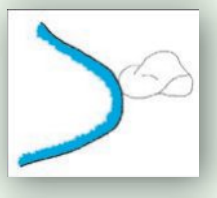


2 Increase the size of the **PENCIL** (Size icon in the ribbon) or select a **BRUSH** tool and draw a thicker line to the left of the rock to create the edge of the stream.

Note: If you make a mistake or you are unhappy with what you have drawn, press `<Ctrl + Z>` or `<Command + Z>` to undo the line and try again.



3 Change the colour to blue and add blue shading next to the stream edge.



4 Add some green shading along the top edge of the stream, and behind the rock.

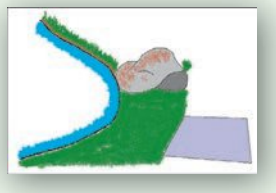
5 Select the **AIRBRUSH** from the **BRUSHES** icon in the ribbon or select a **BRUSH** tool and paint below the rock and next to the stream.

6 Use the **FILL WITH COLOUR** or **PAINT BUCKET** tool to fill the rock with a light and dark shade of grey.

Note: If the fill leaks out over the whole screen, there is a gap in the rock. Undo the fill, use the **PENCIL** tool to fill the gap and try the fill again.

7 Use the **PENCIL** or **BRUSH** tool to add a brown line along the top edge of the stream and use the **AIRBRUSH** to spray over the rock.

8 Use the **POLYGON** tool (from the Shapes icon) to drag a line next to the grass below the rock then click points to create a blanket shape.



9 Use the **FILL WITH COLOUR** or **PAINT BUCKET** tool to fill the shape with a light colour.

10 Use the **ROUNDED RECTANGLE** tool to draw a basket at the top of the blanket and fill it with a colour.

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11 Use the **OVAL** tool to draw some blue ovals in the stream then use the **Line** tool to draw the rod and line from the blanket to the stream.

12 Use the **LINE** tool to draw some mountains above the rock and check that the lines are enclosed.

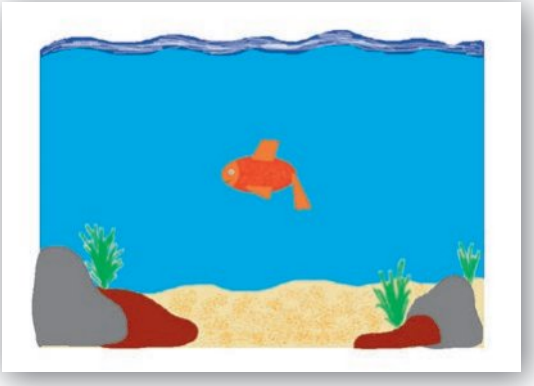
Note: When you draw a line in Microsoft Paint you need to click on the canvas to set the line before drawing the next line.

13 Fill the mountains with a shade of grey or brown.

14 Save your sketch and print a copy or share your work electronically.

7.3 Creating a more detailed sketch

Use the steps in the next exercise to create a sketch of a fish swimming next to a rock as shown on the right.



These instructions use Microsoft Paint although other paint programs could be used. There are instructions for this exercise using Adobe Photoshop on the PIT1 Support Files on *Cambridge GO*.

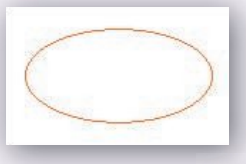
Computer graphics exercise 2

Creating a more detailed sketch

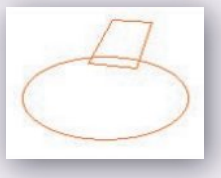
Skills practised
- Drawing tools
- Filling shapes
- Spray painting

Creating the fish

1 Use the **OVAL** tool to draw an orange oval shape near the centre of the screen. This is the fish's body.



2 Use the **POLYGON** tool to create a fin at the top of the fish's body.



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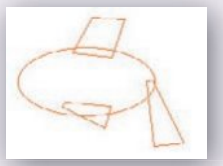
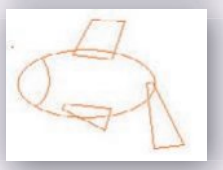
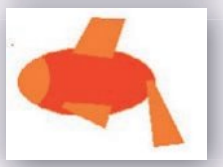
3 Add two more fins (polygons) at the lower side of the body and at the end.



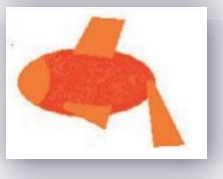
4 Use the **CURVE** tool to create the head of the fish or you can draw an oval over the left side of the current oval then use the **RUBBER** or **ERASER** tool to erase the left part of the second oval.



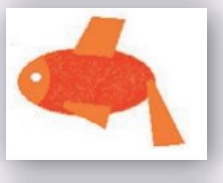
5 Fill the body with a red colour then fill the head and fins with orange.



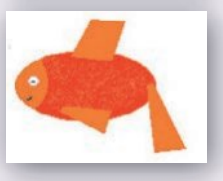
6 You can add a light spray to the body using the **AIRBRUSH** from the **BRUSHES** icon if you wish.



7 Set the colour to white and add a small circle in the head to represent the eye then fill it with white.

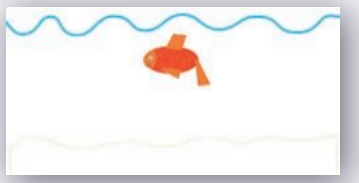


8 Use the **PENCIL** tool to add a small black circle in the white circle to represent the eyeball and to draw a small arc underneath the eye to represent the mouth.

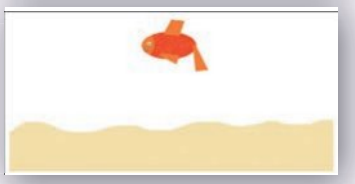


Adding the background

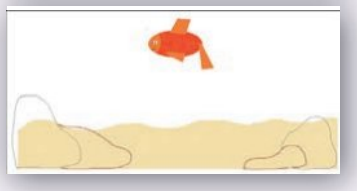
1 Use the **LINE** and **PENCIL** tools to draw an ocean bed in a light yellow sand colour below the fish.



2 Fill the ocean bed with a sand colour.



3 Use the **PENCIL** or **BRUSH** tool to add some grey and brown rocks on the ocean bed.



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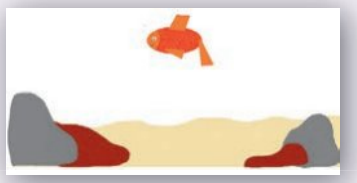
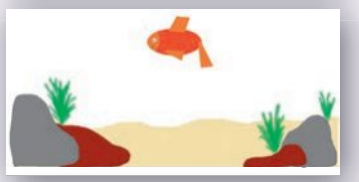
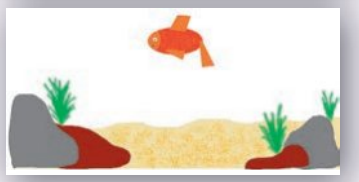
4 Fill the rocks with grey and brown.



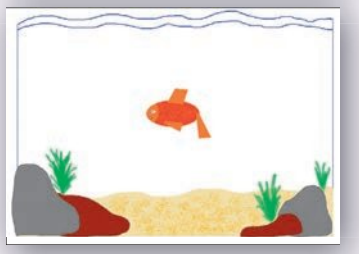
5 Use the **PENCIL** or **BRUSH** tool or one of the **BRUSHES** to add some green plants near the rocks.



6 Use the **AIRBRUSH** or **SPRAY CAN** tool to spray some orange over the ocean bed.



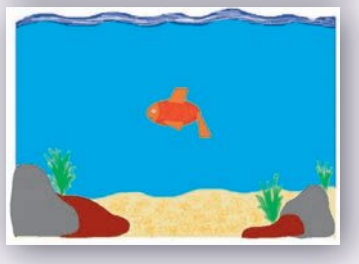
7 Use the **PENCIL** or **BRUSH** tool to add some blue wavy lines at the top of the screen then use the **LINE** tool to enclose the screen at both sides.



8 Fill the wavy lines with a dark blue then fill the rest of the enclosed shape with a lighter blue to represent the ocean.

9 Use one of the **BRUSHES** or **BRUSH** tool to add some white spray to the dark blue section at the top of the ocean.

10 Save your sketch and print a copy or share your work electronically.



7.4 Copying graphics

Shapes drawn in painting programs can be copied and pasted as often as required. The graphic must be selected either by using the Edit Marquee or Rectangle Selection tool, or the Lasso or Free-form Selection tool. The difference between the two is that the Edit Marquee places a rectangular frame around the shape, whereas the Lasso tool selects the shape itself.

The Edit Marquee or Rectangle Selection tool places a rectangular frame with white space around the shape.

The Lasso or Free-form Selection tool just selects the shape of the object.

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Computer graphics exercise 3

Copying graphics

Skills practised
- Selecting graphics
- Copying graphics
- Moving graphics

1 Display the **FILE** tab or **FILE** menu and select **OPEN**.

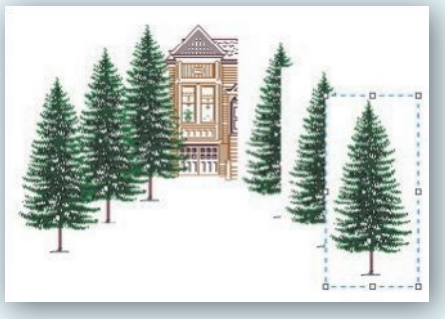
2 Access the PIT1 Support Files and open the House&Tree file.

3 Select the **LASSO** or **FREE-FORM SELECTION** tool (from the **SELECT** icon) and, in Microsoft Paint, turn on **TRANSPARENT SELECTION** from the **SELECT** icon. Drag around the tree to enclose the tree and **COPY** it by typing `<Ctrl + C>` or `<Command + C>`.

4 Paste the tree and move the copies next to the left of the house so that they overlap one another.

5 Some paint programs allow you to hold down the `<Alt + Option>` or `<Ctrl>` key and drag a selected object to make a copy of it. Try it, or use copy and paste to add trees to the right side of the house.

6 Try inserting some trees using the **EDIT MARQUEE** or **RECTANGLE SELECTION** tool (from the **SELECT** icon) to select the tree. (In Microsoft Paint turn off **TRANSPARENT SELECTION** in the **SELECT** icon.) The white space around the tree will mean that the effect is not what is desired.



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7.5 Editing graphics

Most painting programs provide you with a range of tools to alter the appearance of graphics. Some of these include flipping, rotating, scaling (resizing), slanting, distorting, etc.

Computer graphics exercise 4

Editing graphics

Skills practised
- Selecting images
- Rotating images
- Flip vertically
- Flip horizontally
- Distorting images
- Using perspective
- Resizing images

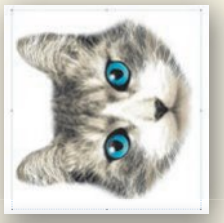
1 **INSERT** a picture from your school's Clip Art library into the painting program.

2 Drag the **EDIT MARQUEE** or **RECTANGLE SELECTION** tool around the picture.

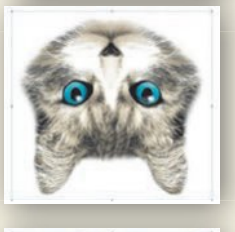
3 Try carrying out each of the following transformations:

a Rotate. The shape should rotate 90° anticlockwise if you select **ROTATE LEFT** 90°. If you select **ROTATE RIGHT** 90° the shape is rotated clockwise.

b Flip Horizontal (which might be within the Rotate or Transform sections of the program). The shape is flipped to face the opposite horizontal position.



c Undo the last steps and try **FLIP VERTICAL** (which might be within the Rotate or Transform sections of the program). The shape is turned upside down.

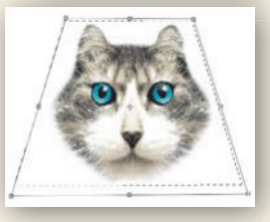


d Stretch. One side of the shape is altered. In Microsoft Paint select the **RESIZE** icon and adjust the **HORIZONTAL SKEW** value. For other programs it is in the **TRANSFORM** section.

e Perspective. If your program allows it, two sides of the shape are altered to give the effect of the shape going into the screen.

f Resize can be used to make a shape smaller; for example, scale to 50%. Try it.

g Try making the shape larger; for example, resize to 200%. Sometimes increasing the size of a shape can cause its definition (accuracy) to be decreased.



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7.6 Introduction to photo editing

When you work with photographs, a more professional graphics program is required. Adobe Photoshop and Adobe Fireworks are some examples of suitable programs.

The following exercises use Adobe Photoshop. You will need access to the PIT1 Support Files on *Cambridge GO* to download some of the images that will be used.

Computer graphics exercise 5

Opening a sample photograph

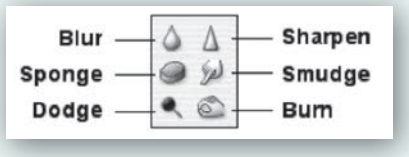
Skills practised
- Blur tool
- Sharpen tool
- Smudge tool
- Sponge tool
- Burn tool
- Dodge tool
- Gradient fill

1 Start Adobe Photoshop and select **OPEN** from the **FILE** menu.

2 Access the PIT1 Support Files and open the Cambridge file. This is a photograph of a college at Cambridge University that needs some improvements made to it.

Photo-editing tools

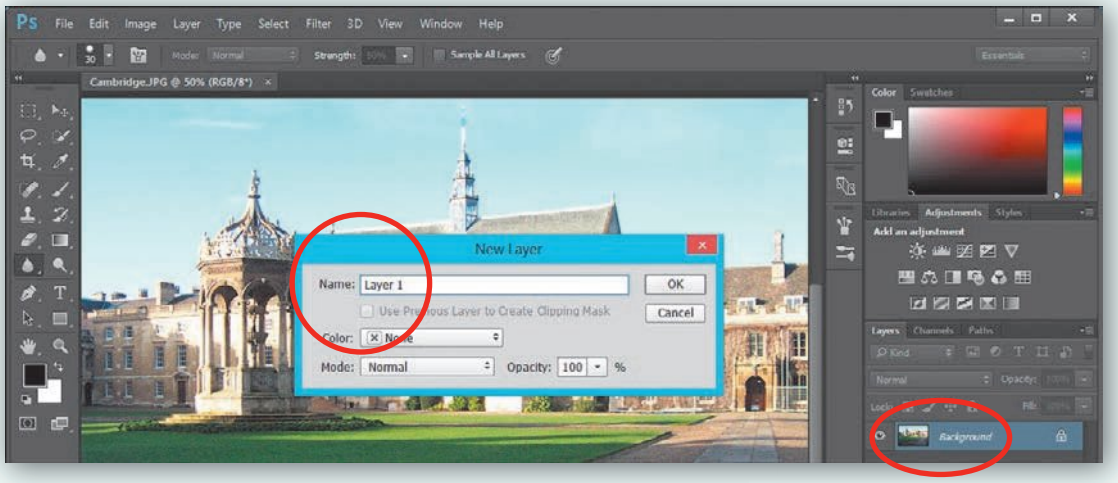
Numerous photo-editing tools are provided in Photoshop. The most frequently used are displayed in the **TOOLS** panel at the left of the screen. The tools that will be used in this exercise are labelled in the diagram on the right.



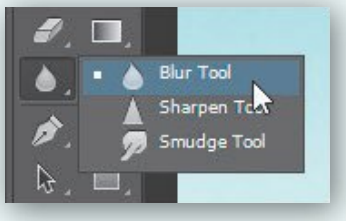
The Blur Tool

The Blur Tool softens hard edges or areas in an image to reduce detail.

1 When you open a photo in Photoshop, the layer that contains it is locked. To unlock the layer, double click on the **BACKGROUND** layer in the Layers panel, call it **LAYER 1** and select **OK**.



2 Select the **BLUR TOOL** in the Tools panel along the left of the screen. The Blur tool options are displayed in a toolbar along the top of the screen.



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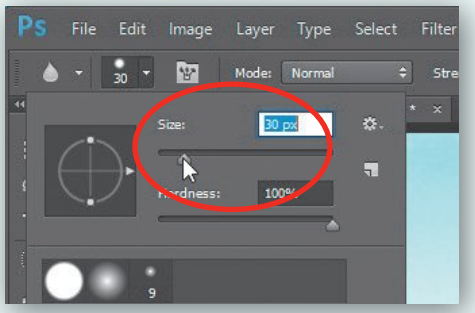
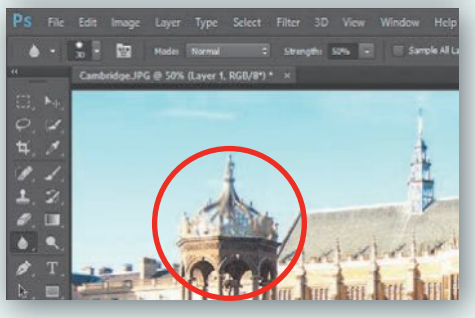
3 Click on the arrow next to the left box in the toolbar (the Brush Presets). Set the **SIZE** to about 30 pt. There are also hundreds of preset brushes and sizes that can be selected.



4 Try painting over the roof of the monument at the left centre of the photograph. This blurs the colours together.

5 Select **UNDO BLUR TOOL** from the **EDIT** menu (or press <Ctrl + Z> or <Command + Z>) to undo the blur effect. Note: If you click more than one time when blurring, you can remove the steps by selecting **STEP BACKWARDS** from the **EDIT** menu as many times as needed.



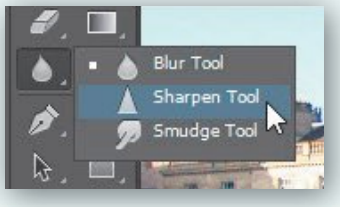
6 Try selecting different **MODES** from the toolbar at the top of the screen and paint over the roof to observe the different blur effects.

7 Undo the effects (or step backwards) to return the image to its original state.

The Sharpen Tool

The Sharpen Tool enhances soft edges to increase clarity.

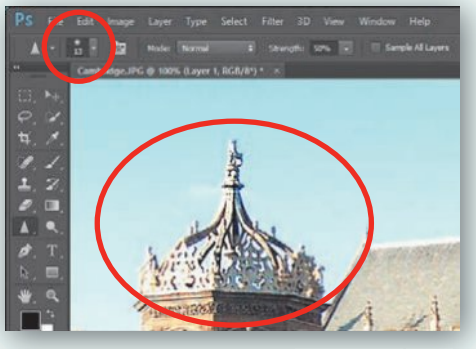
1 Select the **SHARPEN TOOL** from the Tools panel.



2 In the toolbar, set the **BRUSH SIZE** to 13 pt and zoom in on the photo by pressing the <Ctrl+> or <Command+>.

3 Paint lightly over the roof of the monument. The more you paint, the sharper the image becomes. Remember, you can always press <Ctrl + Z> or <Command + Z> to undo any steps.

4 Experiment with other Sharpen modes and adjusting the Strength.



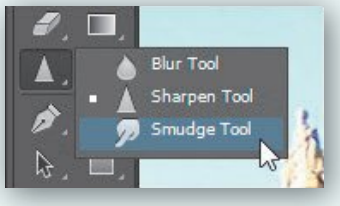
Note: You can zoom the screen out by pressing <Ctrl-> or <Command-> at any time.

5 Undo the effects (or step backwards) to return the image to its original state.

The Smudge Tool

The Smudge Tool merges existing colours or smears new colours into an image.

1 Select the **SMUDGE TOOL** from the Tools panel.



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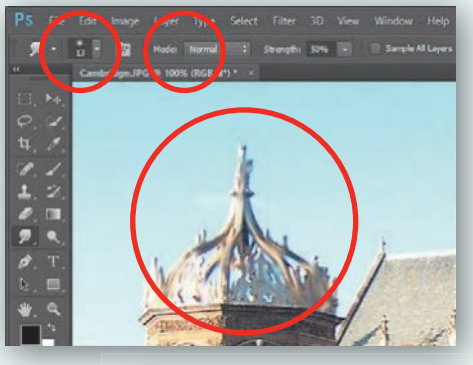
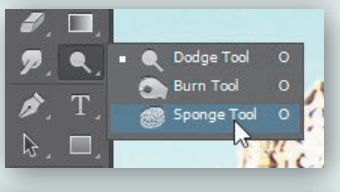
2 Set the **BRUSH SIZE** to 13 pt and set the **MODE** to **NORMAL**.
3 Paint over the roof of the monument to merge the colours.
4 Experiment with the other modes for the Smudge tool.
5 Undo the effects (or step backwards) to return the image to its original state.



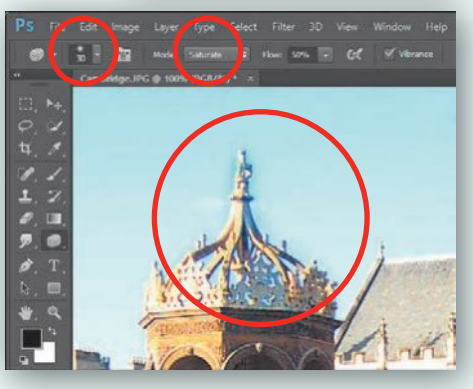
The Sponge Tool

The Sponge Tool subtly changes the colour saturation or vividness of an area.

1 Select the **SPONGE TOOL** from the **TOOLS** panel.



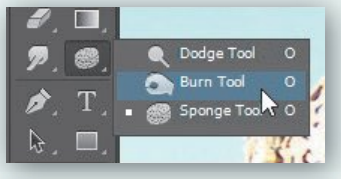
2 In the toolbar set the **BRUSH SIZE** to 30 pt and the **MODE** box to **SATURATE** (this intensifies the colour).
3 Try painting over the roof of the monument to increase its colour intensity.
4 Set the **MODE** to **DESATURATE** and try painting over areas. The colour intensity is reduced.
5 Undo the effects (or step backwards) to return the image to its original state.



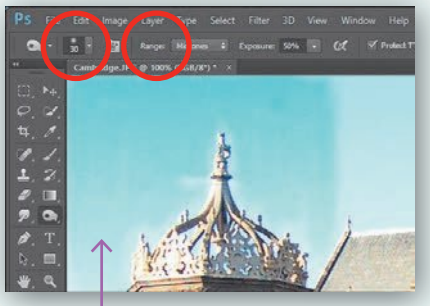
The Burn and Dodge Tools

The Burn Tool darkens areas of an image and the Dodge Tool lightens areas. There are three Ranges (or settings) for these tools: Midtones to change the middle range colours, Shadows to change the dark areas and Highlights to change the light areas.

1 Select the **BURN TOOL** from the **TOOLS** panel.



2 Set the **BRUSH SIZE** to about 30 pt and paint over the sky around the monument to darken its midtones.
3 Release the mouse button and paint over the sky again to further darken it.
4 Set the **RANGE** to **SHADOWS** and try painting over areas of the photo that are already quite dark.
5 Set the **RANGE** to **HIGHLIGHTS** and try painting over some of the light areas of the photo.
6 Undo the effects (or step backwards) to return the image to its original state.



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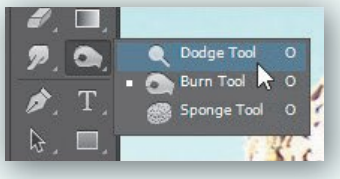
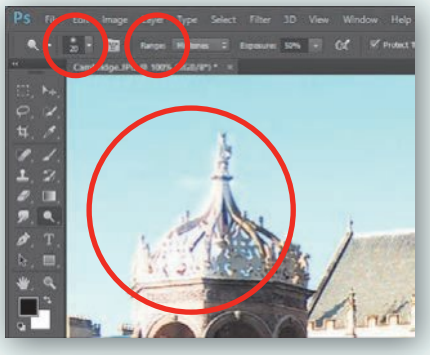
7 Select the **DODGE TOOL** from the Tools panel.



8 Set the **BRUSH SIZE** to about 20 pt and the **RANGE** box to **MIDTONES** and paint over the left side of the monument and to lighten its midtones.

9 Try using the other two ranges.

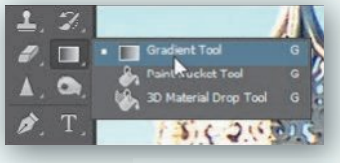
10 Undo the effects (or step backwards) to return the image to its original state.



Gradient Fill

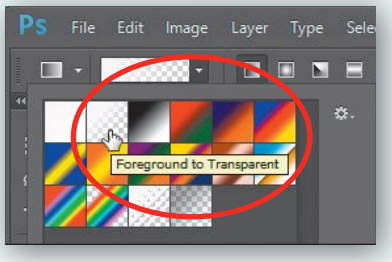
Another way to fade a photograph is to apply a Gradient Fill.

1 Select the **GRADIENT FILL TOOL** from the Tools panel.



2 At the bottom of the Tools panel set the **FOREGROUND COLOUR** to **WHITE**.

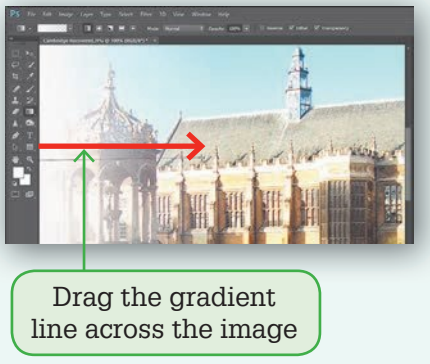
3 In the toolbar, click on the **EDIT GRADIENT** box and select **FOREGROUND TO TRANSPARENT**.



4 Using the pointer, drag a straight line from the centre left of the image to close to its centre.

5 Release the mouse button and the image fades to clear.

6 Experiment with other gradient fills such as dragging diagonal lines.



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7.7 Special effects

Computer graphics exercise 6

Special effects

Photo-editing programs provide numerous special effects. In this exercise you will apply some of those effects to create a designer pet.

Skills practised
- Distorting images
- Liquify effect
- Forward warp tool
- Bloat tool
- Pucker tool
- Push left tool

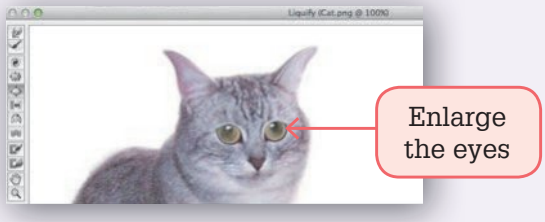
1 In Photoshop, display the **FILE** menu and select **OPEN**. Access the PIT1 Support Files and open the Cat file.

2 Display the **FILTER** menu, highlight **DISTORT** and click on **LIQUIFY**. The image opens in a separate window.

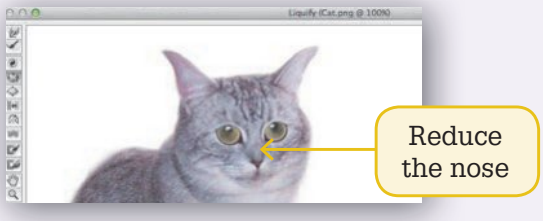
3 In the tools at the left side of the window, select the first tool, the **FORWARD WARP** tool and drag the cat's ears to increase their size.

Note: The **RESTORE ALL** button at the right of the window can be used to return the image to its original state.

4 Select the **BLOAT TOOL** then click and hold on each eye to enlarge them. The **BRUSH SIZE** option at the right of the window can be used to increase the size of the cursor circle.



5 Select the **PUCKER TOOL** then click and hold on the nose to reduce it. Again, the **BRUSH SIZE** option at the right of the window can be used to adjust the size of the cursor circle.

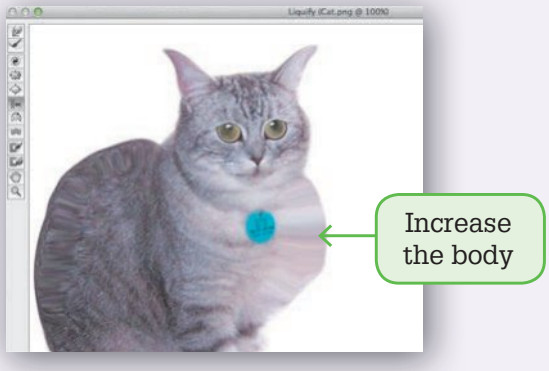


6 Select the **PUSH LEFT TOOL** then drag up the left side of the cat's body and down the right side to make the cat fatter.

7 Experiment with the other tools and try changing the Brush Size, Brush Density and Brush Pressure.

8 Click on **OK** when you are happy with the effects.

9 You might like to try some of the other Filter effects (use the Filter menu – Filter Gallery).



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Computer graphics exercise 7

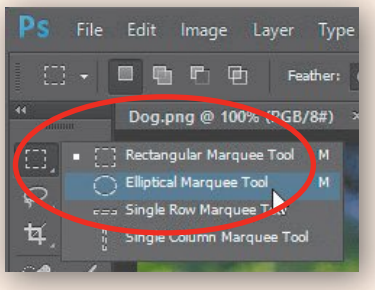
Using masks

You can create masks over photos that just display part of the photo. This can sometimes be easier than trying to repair or erase part of a photo.

Skills practised
- Elliptical marquee
- Layer mask
- Layer effects
- Blur effects

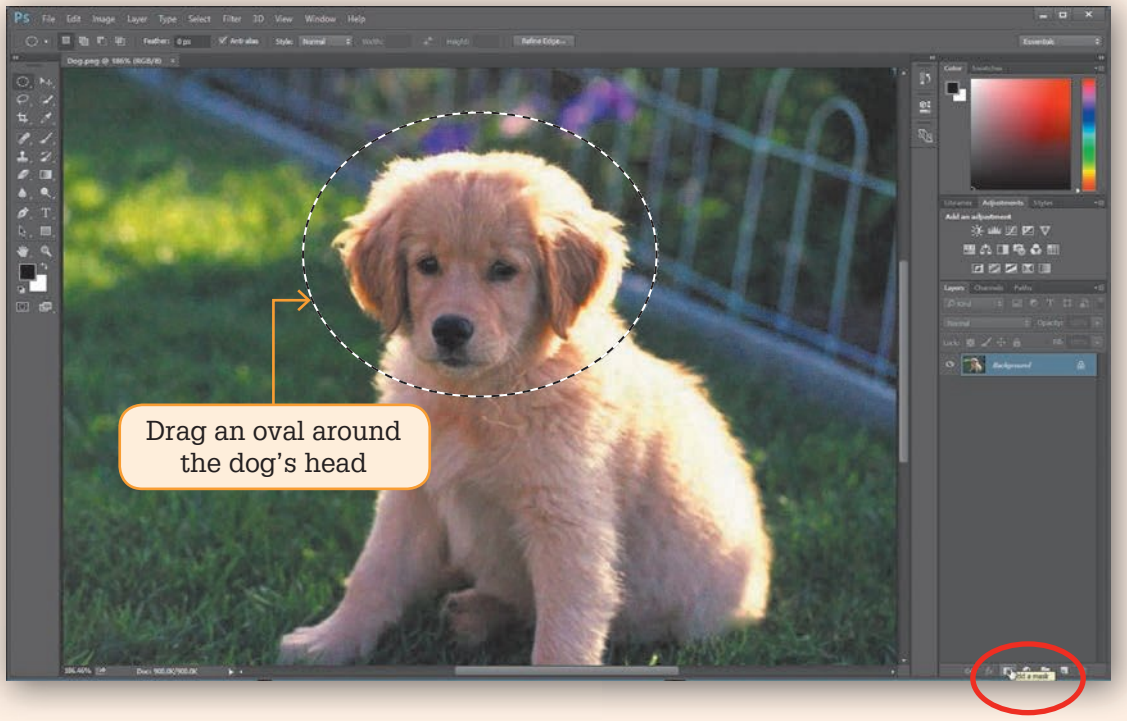
1 In Photoshop, display the **FILE** menu and click on **OPEN**.

2 Access the PIT1 Support Files and open the Dog file.



3 Select the **ELLIPTICAL MARQUEE TOOL** from the Tools panel. It is within the first tool.

4 Drag a selection around the dog's head then click on the **ADD A MASK** icon at the base of the **LAYERS** panel to create the mask.



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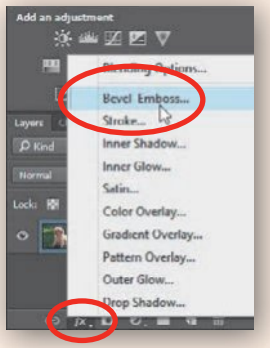
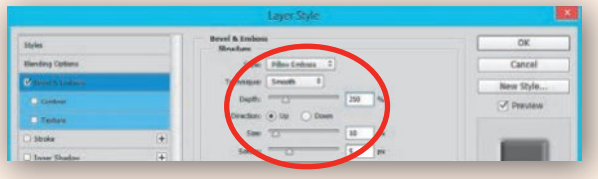
5 You can add styles to the mask. Click on the **ADD A LAYER STYLE** icon at the base of the **LAYERS** panel and select **BEVEL EMBOSS**.



6 Set the **STYLE** to **PILLOW EMBOSS**, the **DEPTH** to 250, the **SIZE** to 10, the **SMOOTH** to 5 and select **OK**.

7 You might like to experiment with other styles such as Drop Shadow using the **ADD A LAYER STYLE** icon.

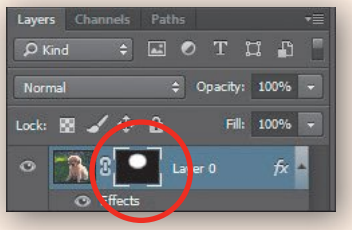


Blurring the Mask

The Mask can also be blurred to enhance the effect.

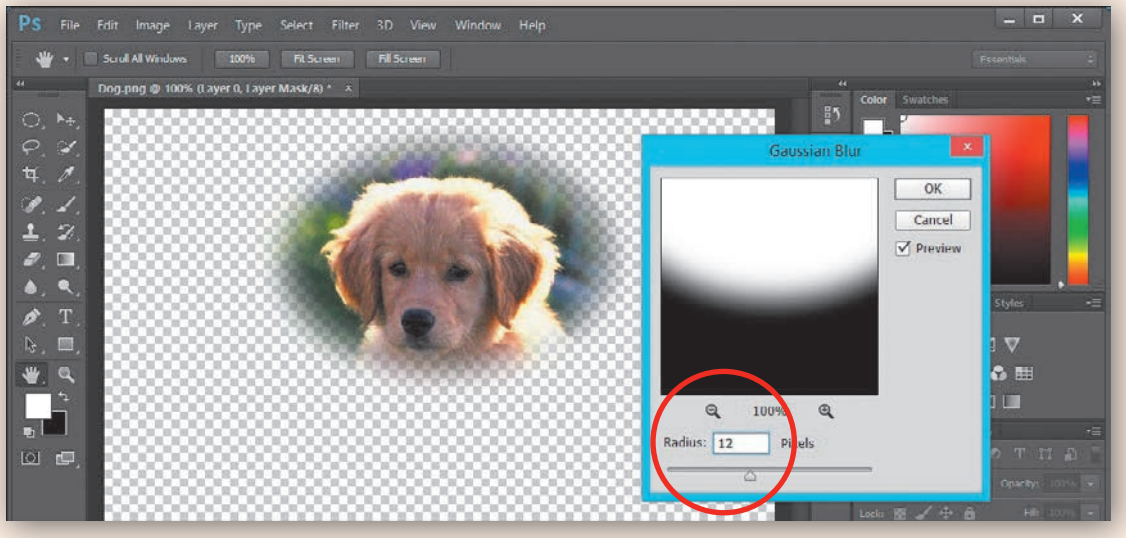
1 In the **LAYERS** panel check that the mask frame is selected next to the dog. It should have a white border around. If it doesn't, click on it to select it.

Note: If the dog frame is selected, the dog itself will be blurred, not the mask.



2 Display the **FILTER** menu, highlight **BLUR** and select **GAUSSIAN BLUR**.

3 Set the **RADIUS** in the **GAUSSIAN BLUR** dialogue box to about 12 pixels and select **OK** to blur the mask.



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7.8 Adding text to images

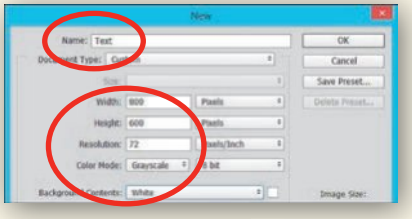
You can also add text to an image.

Computer graphics exercise 8

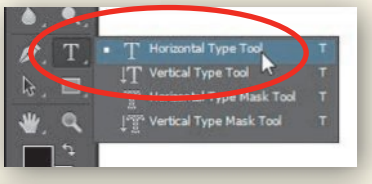
Adding text to an image

Skills practised
- Text tool
- Text formats
- Text warp
- Text effects

1 Start a **NEW** Photoshop file and name it: Text. Set the Width to 800 pixels, the Height to 600 pixels, the Resolution to 72 pixels per inch, Contents to White and select **OK**.

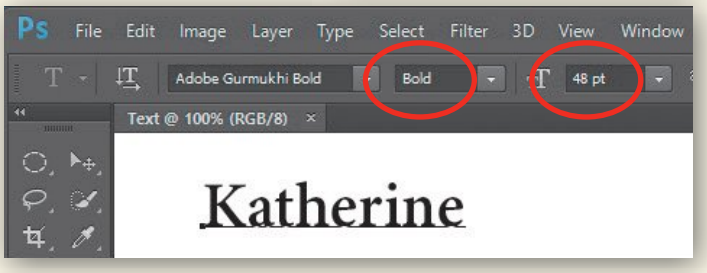


2 Click and hold down the mouse button on the **TYPE TOOL** (T) in the Tools panel and click on the **HORIZONTAL TYPE TOOL**.

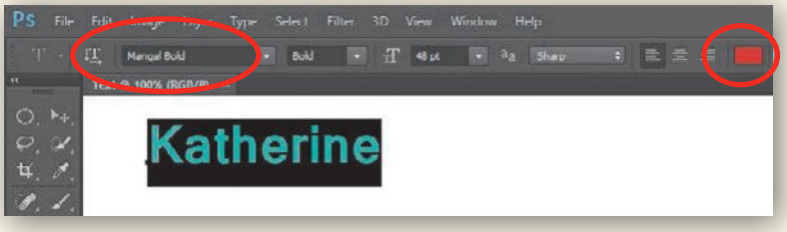


3 In the toolbar at the top of the screen, go to **Font** to select a font and font style, and set the font size to 48 pt.

4 Click near the top left of the screen and enter your first name.

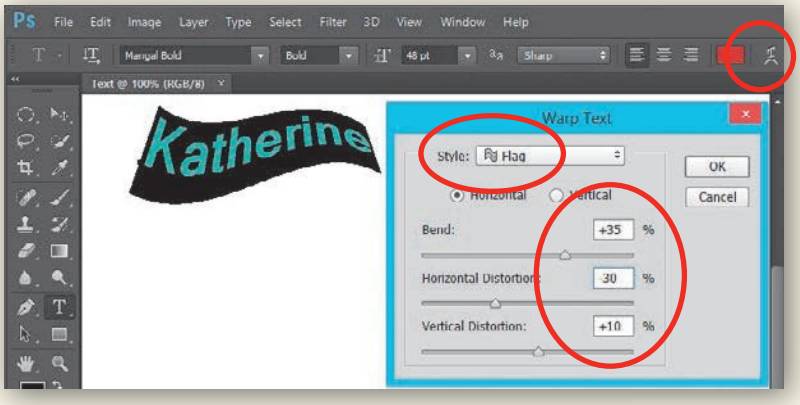


5 Use the mouse to highlight your name and in the toolbar use the **COLOUR** box to set a colour of your choice.



6 Click on the **CREATE WARP TEXT TOOL** in the toolbar and select the different styles, in turn, from the Style box to see their effect on your name.

7 Try changing the **HORIZONTAL** and **VERTICAL DISTORTION** in the **WARP TEXT** dialog box and select **OK** to set the text.



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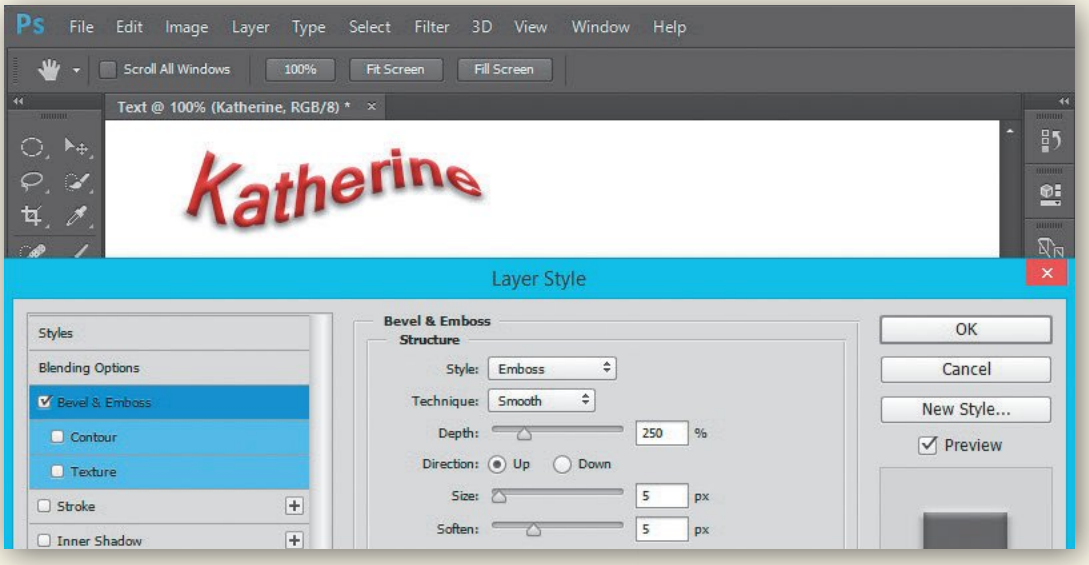
8 You can apply styles to text. Select the **LAYER** menu, highlight **LAYER STYLE** and select **BEVEL EMBOSS**.

9 Adjust the settings and once you are happy with the effect select **OK**.



Note: The **MOVE TOOL** from the Tools panel can be used to move the text to different parts of the canvas. If you need to edit the text, select the text layer then select the **TYPE TOOL** from the Tools panel and highlight the text.

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COMPUTER GRAPHICS PROJECT

Murrayville Council wishes to advertise a new nature sanctuary that they have just created and you have been employed to produce the page for them. This page could be added to a website, included in a newspaper or simply printed and displayed around the district. Use the following diagram as an example.

Collecting the data

The Sanctuary image from the PIT1 Support Files can be used for your page or you can find an appropriate image of your own.

Defining the solution

Draw a mock-up sketch on paper of the page that you will be creating. Indicate what heading you are going to use, the fonts and font sizes, where the text will be placed on the page, any effects that will be applied to the image, etc. There is an example of a mock-up sketch in the Word processing project on page 78.

Implementing

> Use the photo-editing tools that you have learned to fade parts of the photograph and enhance other sections. You will need to unlock the image's layer before doing this.

> Add the text shown in the diagram above or create some similar text.

> Format the text appropriately. Note: You need to select the layer from the LAYERS panel when you need to edit an object and the MOVE TOOL from the Tools panel when you need to move objects.

> If you wish to, you can add a mask around the image and apply effects to the mask.

Evaluating, collaborating and managing

1 Ask other people to look at your publication and to give you feedback on the quality and accuracy of your poster. Describe what was said and what changes you made to your poster because of it.

2 What are the advantages of having posters produced on a computer as opposed to doing them manually? Are there any disadvantages?

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Module 8

SPREADSHEETS

Programs featured for exercises:

Microsoft Excel
Google Sheets

ISBN 978-1-316-62393-0

Teacher information

IT knowledge and skills covered in this module

- Creating spreadsheets
- Spreadsheet structure: columns and rows
- Using formulas
- Performing calculations
- Using different chart types: column, line, pie, area
- Collecting and sorting data

Suggested further uses across the curriculum

- Science (for presenting information). Communicate ideas, findings and evidence-based solutions to problems using scientific language; and representations, using digital technologies as appropriate (ACSIS133, ACSIS148).
- Geography (for presenting information). Represent data in a range of appropriate forms – for example, climate graphs, compound column graphs, population pyramids, tables, field sketches and annotated diagrams – with and without the use of digital and spatial technologies (ACHGS049, ACHGS057).
- Civics and citizenship (organising information). Identify, gather and sort information and ideas from a range of sources (ACHCS055, ACHCS069).

Alignment with the Australian Curriculum

ICT Capability elements covered

- Investigating with ICT
  - > define and plan information searches
- Creating with ICT
- Communicating with ICT
  - > collaborate, share and exchange
  - > understand computer mediated communications
- Managing and operating ICT

Other general capabilities covered

- Literacy
- Numeracy
- Critical and creative thinking
- Personal and social capability

Digital Technologies curriculum content in this module

Processes and production skills

- Acquire data from a range of sources and evaluate authenticity, accuracy and timeliness (ACTDIP025)
- Define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints (ACTDIP027)
- Design the user experience of a digital system, generating, evaluating and communicating alternative designs (ACTDIP028)
- Evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability (ACTDIP031)

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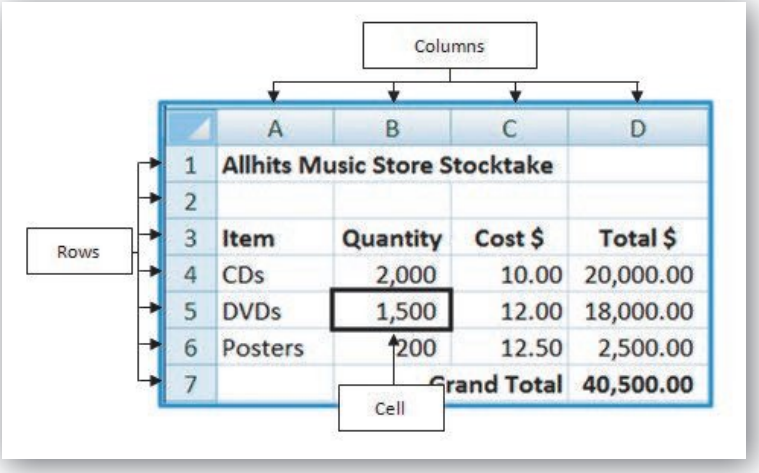
8.1 What is a spreadsheet?

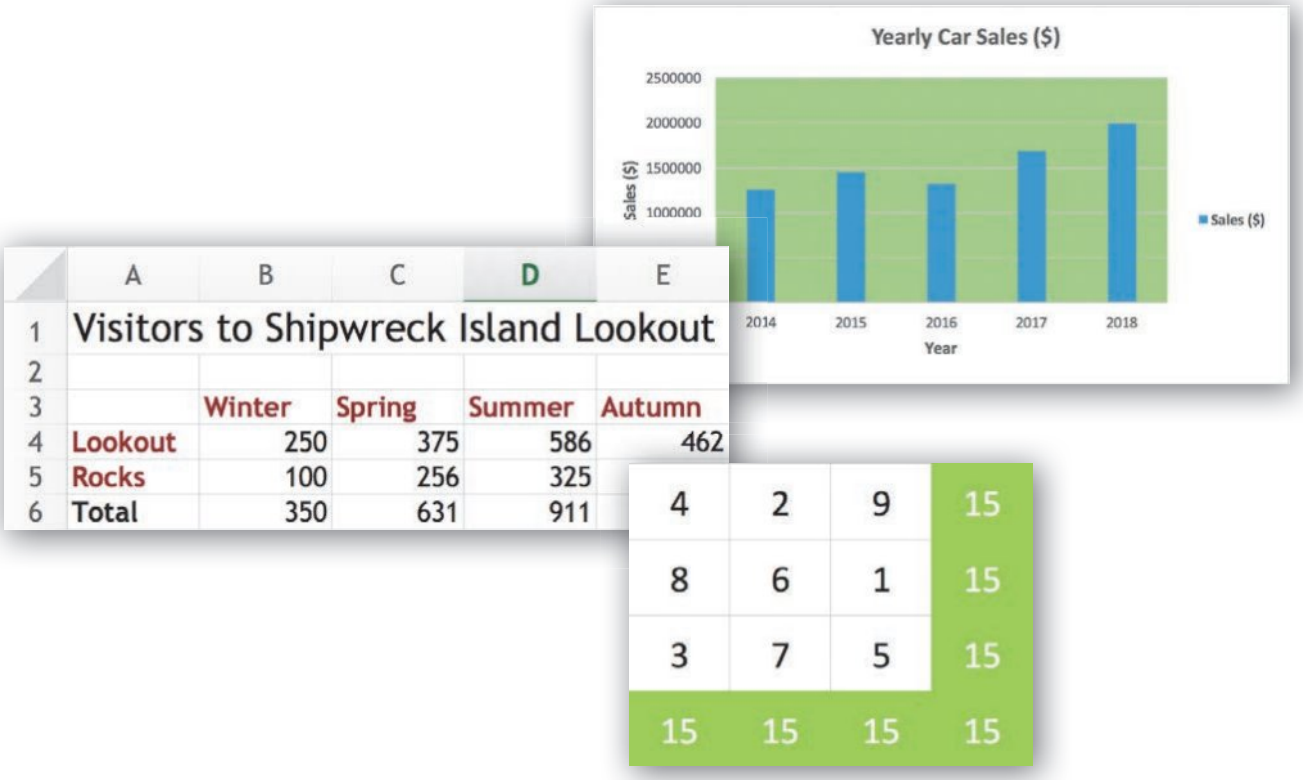
A spreadsheet is an application that is used to organise and manipulate data. A spreadsheet is divided into columns and rows, allowing data to be organised in a systematic manner. The columns and rows create cells that are used to store data and formulas.



A spreadsheet can be used to:

- list results
- do calculations
- create graphs
- sort information.

While all of these tasks can be performed by hand on paper, it is much quicker to use a computerised spreadsheet because it automatically recalculates each time new data is entered or changed.



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8.2 Spreadsheet structure

The intersection of columns and rows in a spreadsheet creates cells. Each cell on a spreadsheet has a name or address. It is named according to its location: the name of the column first, followed by the name of the row.

	A	B	C	D
1	Allhits Music Store Stocktake			
2				
3	**Item**	**Quantity**	**Cost $**	**Total $**
4	CDs	2,000	10.00	20,000.00
5	DVDs	1,500	12.00	18,000.00
6	Games	3,000	12.50	37,500.00
7			Grand Total	**75,500.00**

- The columns in this spreadsheet are named alphabetically with letters.
- The rows are named with numbers.
- So the first cell in the top left-hand corner is called A1.
- The cell that has the word CDs in it is A4.
- The grand total value or 75,500 is in cell D7.

Spreadsheets exercise 1

Spreadsheet structure

Skills practised
- Recognise cell references

Look at the spreadsheet above.

1 What is the text in cell A6?

2 What is the name of the cell in which the text Cost appears?

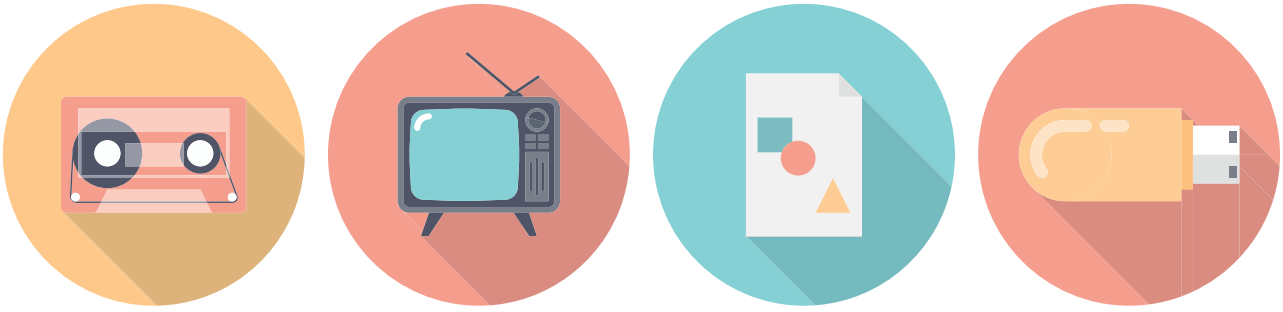
3 Which cell does the number 12 appear in?

4 **a** What is the number in B5?

b What is the number in C5?

c What is the result of multiplying these two numbers?

d What is the name of the cell in which this number appears?



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8.3 Data entry

Spreadsheets can be used simply for entering and organising data.

Spreadsheets exercise 2

Data entry

Skills practised
- Create a spreadsheet
- Enter text and data
- Save and close file

1 Start a new blank spreadsheet and enter text and numbers into each cell.

	A	B	C	D	E
1	All Time Top 10 Hits				
2					
3		Title		Artist	
4	1	Imagine		John Lennon	
5	2	Hey Jude		Beatles	
6	3	Hotel California		Eagles	
7	4	American Pie		Don McLean	
8	5	Unchained Melody		Righteous Brothers	
9	6	Bohemian Rhapsody		Queen	
10	7	In the Air Tonight		Phil Collins	
11	8	Down Under		Men at Work	
12	9	Stayin' Alive		Bee Gees	
13	10	You're the Voice		John Farnham	

2 Proofread the text and data to check you have entered it correctly.

3 Select **SAVE**, access your storage disk or folder, enter the name: Hit list, click on **SAVE** or **OK**. For Google Sheets, just type: Hit list in the **SPREADSHEET NAME** box.

4 Click on the **FILE** and **CLOSE** to close the file. For Google Sheets, just click on the **HOME** button to close the file and return to the **HOME** page.

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8.4 Formulas and calculations

A spreadsheet is often used to perform calculations. A spreadsheet can have formulas entered to calculate information for us.

A formula is an equation that calculates a new value from existing values.

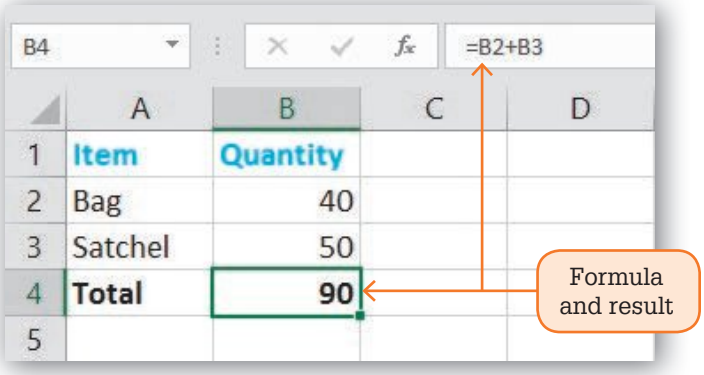
For example: 40 + 50 = 90

The formula is: Add the first number to the second number and display the result. In a spreadsheet it would look like this:

The formula in cell B4 is the result of adding:

B2 + B3 = B4

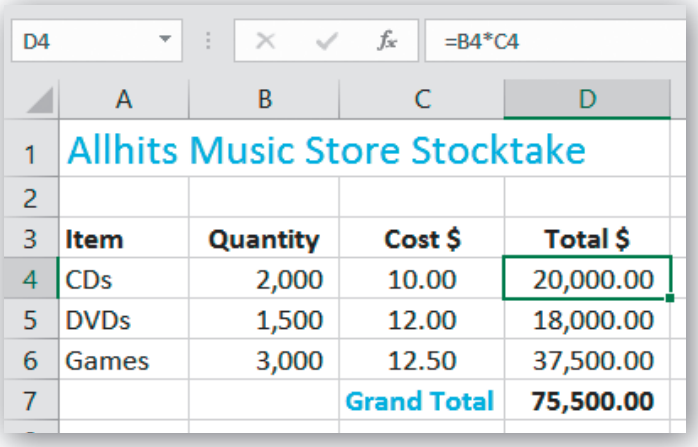
Or 40 + 50 = 90



Here are some examples of what spreadsheet formulas can look like:

Subtract	Multiply	Divide
=G6 – G7	=A1*B4	=D5/E5

For example, formulas can be used to calculate the total value of stock in the music store. The number of CDs by the cost of the CDs results in the total value of CDs.



Each formula is entered into the cell that is to display the result. So in the example above, D4 holds the formula =B4*C4. This will look up the values in cells B4 and C4 and multiply them to give a result, which is then displayed in D4. Microsoft Excel and Google Sheets always have an = sign at the start of each formula.

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Spreadsheets exercise 3

Simple calculations – multiplication and addition

Skills practised
- Creating a spreadsheet
- Entering data
- Entering formulas
- Saving and closing

1 In Google Sheets, create the following spreadsheet, entering the text and numbers as shown. (Format tip: To make the heading text bold, click on the cell and click on the **BOLD** button on the **HOME** tab. To make the **COST** values, have two decimal places, highlight the cells and click on the **INCREASE DECIMAL** button until two decimal places are displayed.)

	A	B	C	D
1	Allhits Music Store Stocktake			
2				
3	**Item**	**Quantity**	**Cost $**	**Total $**
4	CDs	2,000	10.00	
5	DVDs	1,500	12.00	
6	Games	3,000	12.50	
7			Grand Total	

2 Proofread the text and data to check you have entered it correctly.

3 Use a formula in cell D4 that multiplies B4 by C4 to give the value of CDs.

4 Repeat to calculate the **TOTAL** for DVDs and another for **GAMES**. So you should have a formula in D4, another in D5 and another in D6.

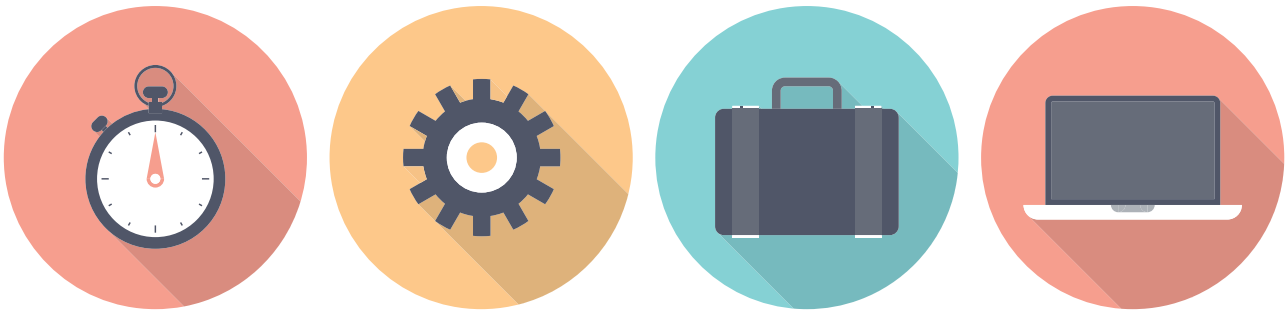
5 Put a formula in the cell next to **GRAND TOTAL** (D7) that will add up the total of each item – that is, add the values in D4, D5 and D6.

6 In Microsoft Excel click on the **SAVE** button, access your storage disk or folder, enter the name **STOCKTAKE**, click on **SAVE** or **OK**. In Google Sheets, click into the name box and type **STOCKTAKE** to rename the file, then press **ENTER**.

7 Change the cost of CDs to 12.50. What is the new total for CDs?

8 Change the **QUANTITY** value of **GAMES** in B6 to 2500. What is the new total for **GAMES**?

9 In Microsoft Excel, click on the tab **FILE** and **CLOSE** to close the file. For Google Sheets, just click on the **HOME** button to close the file and return to the **HOME** page.



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Spreadsheets exercise 4

Simple calculations – addition

Skills practised
- Creating a spreadsheet
- Entering data
- Entering formulas
- Saving and closing

1 Create the following spreadsheet.

H18

	A	B	C	D	E	F	G
1	Allmine Gold Mines Incorporated						
2	Daily Nugget Production kgs						
3							
4	MINE	Mon	Tue	Wed	Thu	Fri	Total
5	Yellow	1235	120	1256	1220	1200	
6	White	162	178	180	179	170	
7	Rose	152	160	162	161	1623	
8	Old	1052	1010	990	999	1022	
9	Total						

2 Use addition to add the total for each day (i.e. each column).

3 Use addition to add the total for each mine (i.e. each row).

4 Select **SAVE** and name it: Production.

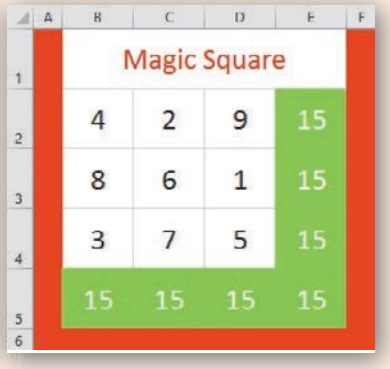
Challenge – magic square

A 3 x 3 magic square works by entering numbers so all rows, all columns and the diagonal add to the same number.

1 Create a new spreadsheet. (You will learn how to format it to look like the picture later in the module.) Use addition to create a check for the totals on each row, column and diagonal on a magic square. It should work no matter which number it is to add to. Start by entering a solution for 15.

E5 =B2+C3+D4

	A	B	C	D	E
1		Magic Square			
2		4	2	9	15
3		8	6	1	15
4		3	7	5	15
5		15	15	15	15
6					



2 Test it to add to 21, try it again to add to 20.

3 Save the file as: Magic, then close.

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Spreadsheets exercise 5

Simple calculations – division and subtraction

Skills practised
- Creating a spreadsheet
- Entering data
- Entering formulas
- Saving and closing

1 Create the following spreadsheet. (Format tip: Highlight the cells and click on the **CENTRE** button on the **HOME** tab to centre text and data in a cell.)

	A	B	C	D	E	F	G
1	Slice of Heaven Cake Shop						
2					Per Slice:		
3	Item		Cake Cost	Slices	Cost	Price	Profit
4			$		$	$	$
5	Chocolate Mud		40.00	10		6.50	
6	Carrot		24.00	8		4.50	
7	Banana		28.00	8		4.50	
8	Ginger Delight		25.00	10		5.00	
9	Strawberry Cream		33.00	10		6.00	

2 The per slice cost for each cake is the cake cost divided by the number of slices into which it is cut. Enter a formula in the cells in **COLUMN E** to calculate the cost per slice for each cake.

3 The profit per slice is the price per slice minus the cost per slice. Enter a formula to calculate the profit per slice for each cake.

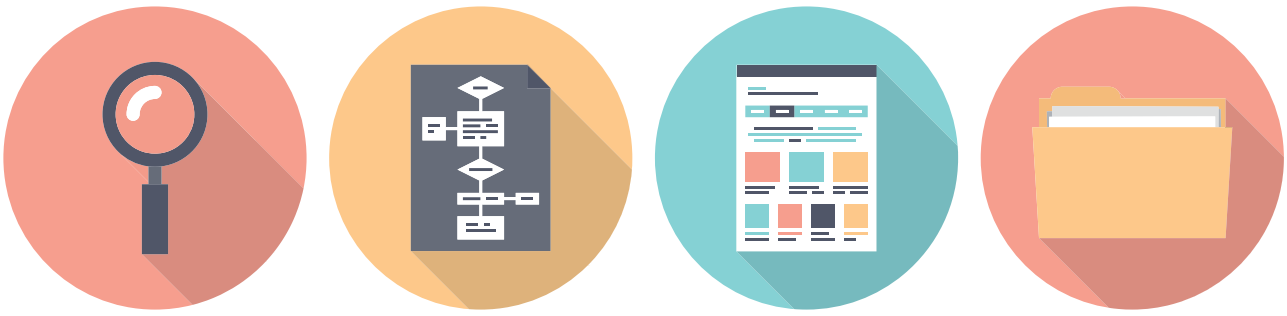
4 Which cake makes the most money per slice?

5 Which cake makes the least amount per slice?

Challenge: How do we work out the profit per cake?

1 Enter a formula in **COLUMN H** cells to calculate the profit for each cake if every piece of each cake was sold.

2 Save the file with the name: Cake price details.



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Spreadsheets exercise 6

Simple calculations – multiplication, addition and subtraction

Skills practised
- Creating a spreadsheet
- Entering data
- Entering formulas
- Simple formatting
- Saving and closing

1 Create the following spreadsheet.

	A	B	C	D	E	F	G
1	Canteen Order Form						
2							
3	**Name**	Jimmy Jamms					
4	**Year**	9 Red					
5							
6	**Item**			**Qty**	**Price**	**Total**	
7					$	$	
8	Cheese sandwiches			2	2.50		
9	Strawberry milk			1	3.00		
10	Red frogs			3	0.10		
11	Apple			1	0.50		
12							
13				**Total**			
14				Money enclosed		10.00	
15				**Change**			
16							

2 Enter a formula into F8 that will calculate the charge for two rounds of cheese sandwiches.

3 Enter formulas into the cells F9, F10 and F11 to calculate the charges for these items.

4 Enter a formula into F13 that calculates a **TOTAL** charge for all items ordered.

5 Enter a formula in F15 that calculates the **CHANGE** depending on what is entered in F14.

Test your spreadsheet

1 What happens if Jimmy encloses $20 instead of $10? What happens if he orders three rounds of sandwiches?

2 Save the file with the name: Order form.

3 Close the file.

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Spreadsheets exercise 7

The SUM function

Skills practised
- Creating a spreadsheet
- Entering data
- Using functions
- Saving and closing

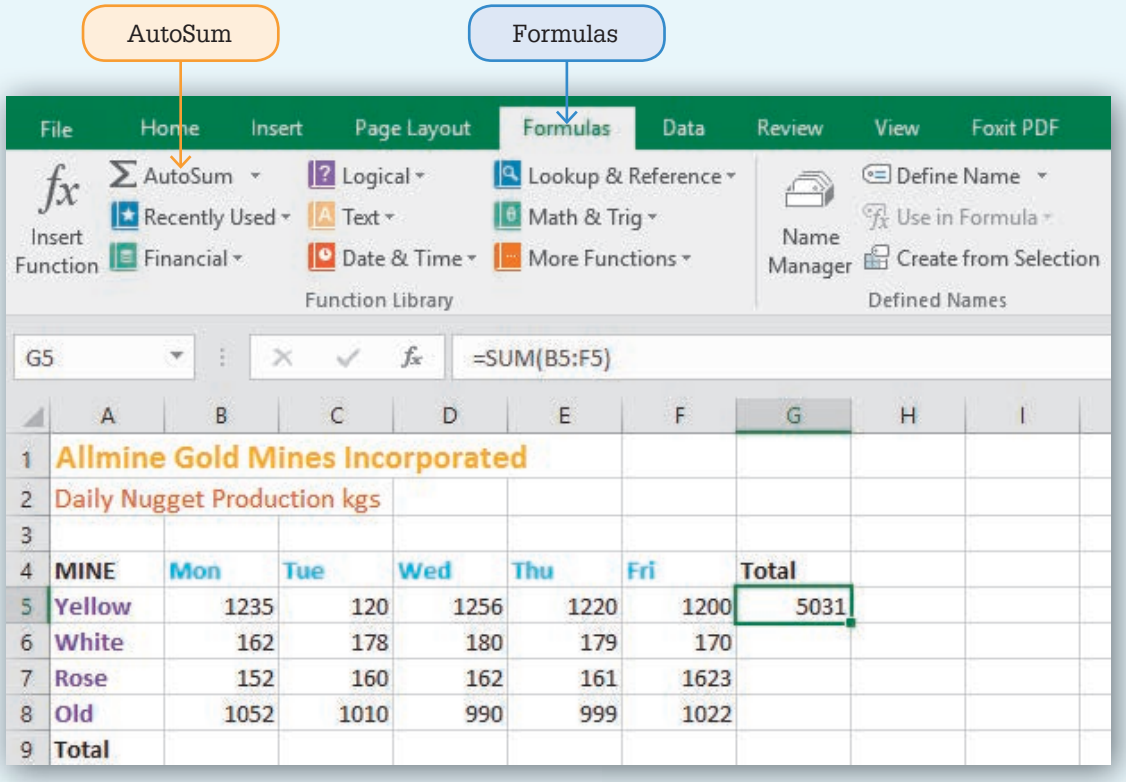
Special calculations can be made in Excel using functions. There are many functions available to use in Excel. A very simple but useful function is the SUM function. You can use it instead of entering a long addition equation. Excel even has a special button you can use to enter it quickly. For example, in the calculation below in G5 where previously:

G5=B5+C5+D5+E5+F5 is the same as G5=SUM(B5:F5)

1 Open the file Production, which you created in Exercise 4, or start a new spreadsheet and enter the text and data shown below. For Google Sheets, you can type `=SUM` then select the cells to be summed, then type `)` and press `<Enter>` to set the formula.

2 Click on cell G5 and click on the **FORMULAS** tab then the **AUTOSUM** button. Excel scans above and then to the left for values to add. Excel assumes you want to add from B5 to F5, which is correct. Press `<Enter>` to set the formula.

3 Check you are in cell G6 and click on the **AUTOSUM** button again to add the next row of values. Check the correct cells are being added together then press `<Enter>`.



	A	B	C	D	E	F	G	H	I
1	Allmine Gold Mines Incorporated								
2	Daily Nugget Production kgs								
3									
4	MINE	Mon	Tue	Wed	Thu	Fri	Total		
5	Yellow	1235	120	1256	1220	1200	5031		
6	White	162	178	180	179	170			
7	Rose	152	160	162	161	1623			
8	Old	1052	1010	990	999	1022			
9	Total								

4 So far so good; however, sometimes the cells you want to add together are not automatically selected. Click into cell G7 and click on the **AUTOSUM** button. This time it wants to add the two cells above, which is not what you want. You have to select the correct cells.

5 Highlight the range of cells from B7 to F7 as shown on the next page then press `<Enter>` to set it.

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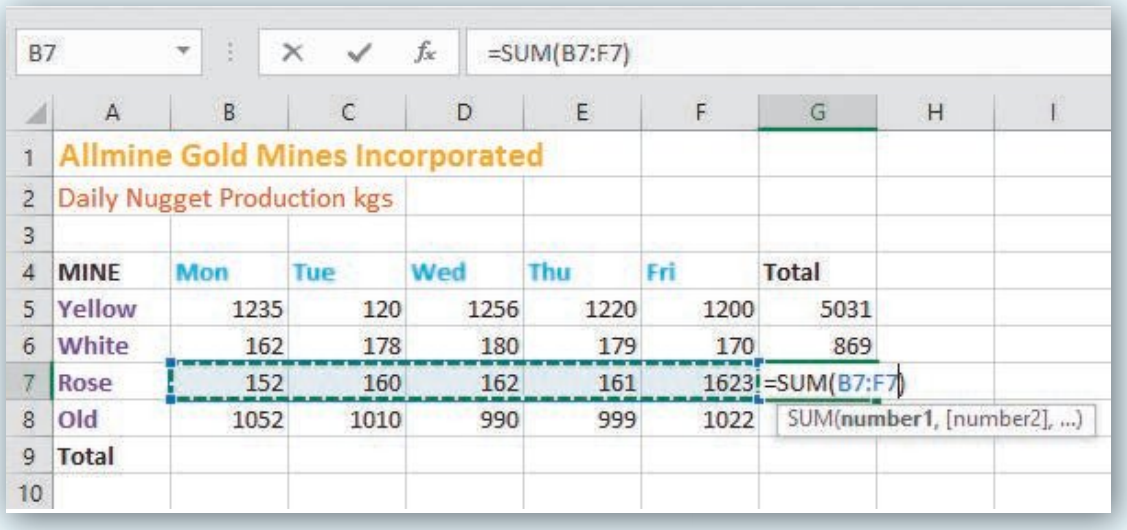
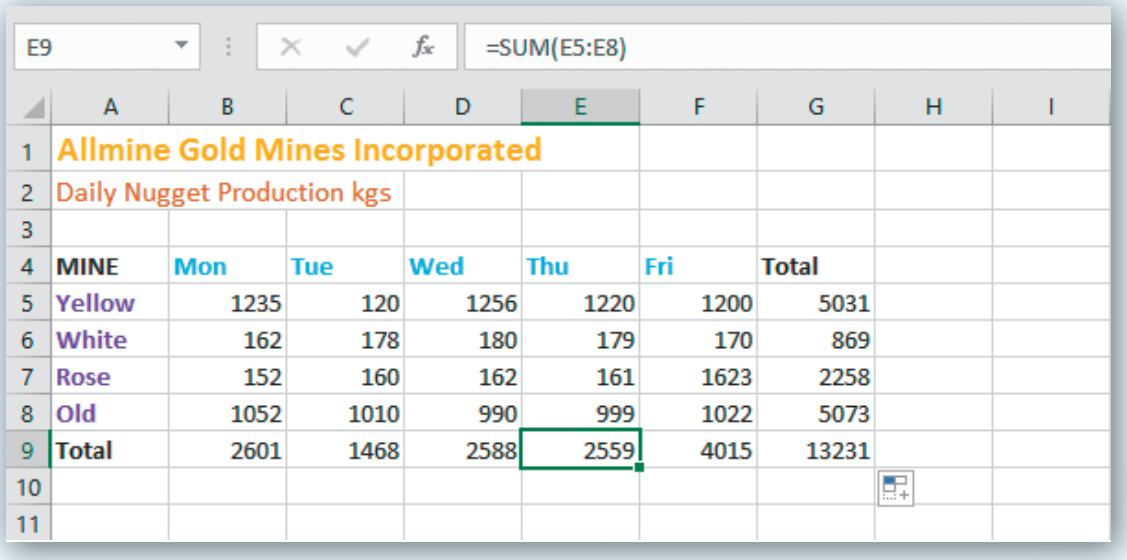
6 Repeat these actions for cell G8. For Google Sheets, you can type `=SUM` (then select the cells to be summed, then type) and press `<Enter>` to set the formula.



	A	B	C	D	E	F	G	H	I
1	Allmine Gold Mines Incorporated								
2	Daily Nugget Production kgs								
3									
4	MINE	Mon	Tue	Wed	Thu	Fri	Total		
5	Yellow	1235	120	1256	1220	1200	5031		
6	White	162	178	180	179	170	869		
7	Rose	152	160	162	161	1623	=SUM(B7:F7)		
8	Old	1052	1010	990	999	1022	SUM(number1, [number2], ...)		
9	Total								
10									

7 Use the **AUTOSUM** function to calculate the total for each day.



	A	B	C	D	E	F	G	H	I
1	Allmine Gold Mines Incorporated								
2	Daily Nugget Production kgs								
3									
4	MINE	Mon	Tue	Wed	Thu	Fri	Total		
5	Yellow	1235	120	1256	1220	1200	5031		
6	White	162	178	180	179	170	869		
7	Rose	152	160	162	161	1623	2258		
8	Old	1052	1010	990	999	1022	5073		
9	Total	2601	1468	2588	2559	4015	13231		
10									
11									

8 Save and close the file.

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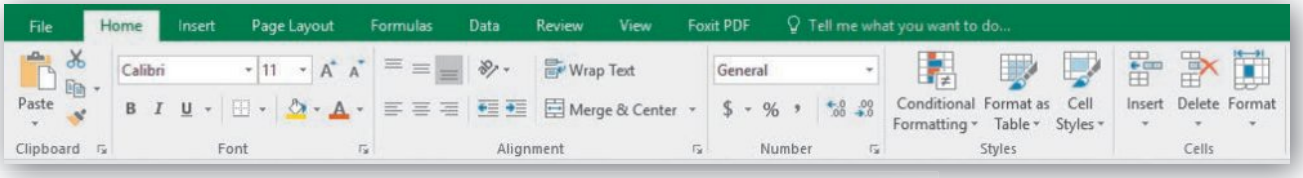
8.5 Formatting

There are lots of ways that the appearance of a spreadsheet can be improved. This is called formatting. The data and text are not actually changed, just the way they appear on the sheet changes. Formatting should make the data in a spreadsheet easier to read. Inserting rows and columns, changing font size and colour, shading cells, formatting numbers and centring text are just some of the formatting features.

Most of the formatting options are available on the **HOME** tab. If you have used Microsoft Word or PowerPoint or Google Docs and Slides you will probably be familiar with the buttons that format text size, style and colour.



	A	B	C	D	E	F
1		Magic Square				
2		4	2	9	15	
3		8	6	1	15	
4		3	7	5	15	
5		15	15	15	15	
6						

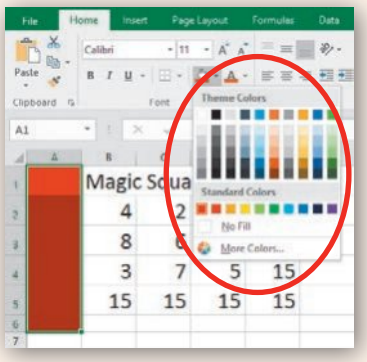
Spreadsheets exercise 8

Formatting 1

You are going to format the spreadsheet above to look like that to the right.

Skills practised
- Changing font
- Changing text size
- Changing text colour
- Alignment
- Cell shades

1. Open the file Magic created in the challenge for Exercise 4 or create it now.
2. Highlight all the cells and click the **FONT SIZE** button and click 20.
3. Highlight the cells to be filled with colour and click on the **FILL COLOUR** button, select a colour. (You can use the **THEME** colours or click on **MORE COLOURS** for more choice.)
4. Highlight the cells to have their font colour changed and click on the **FONT COLOUR** button and select a colour. Remember, it should be easy to read.
5. Column width and row height can be modified just by dragging their border.
6. Move the mouse over the lower border of a row to change until the pointer changes to a double-headed arrow. Click, hold and drag down to the required height.
7. Move the mouse over the right-hand border of a column to be changed in width until the pointer becomes a double-headed arrow. Click, hold and drag.



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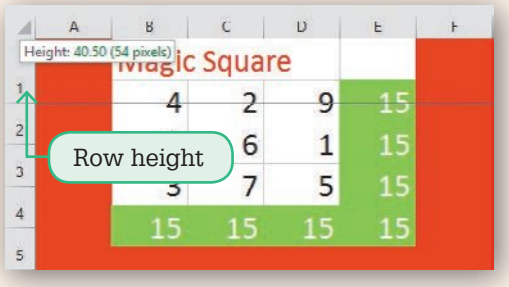
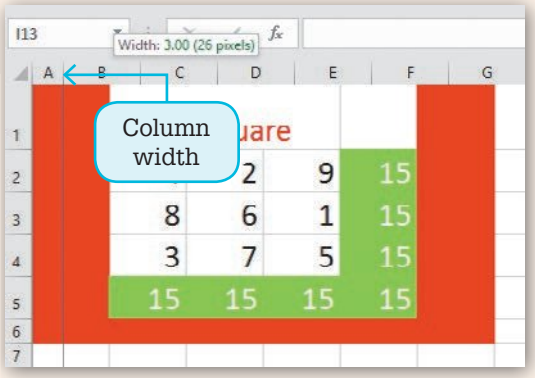
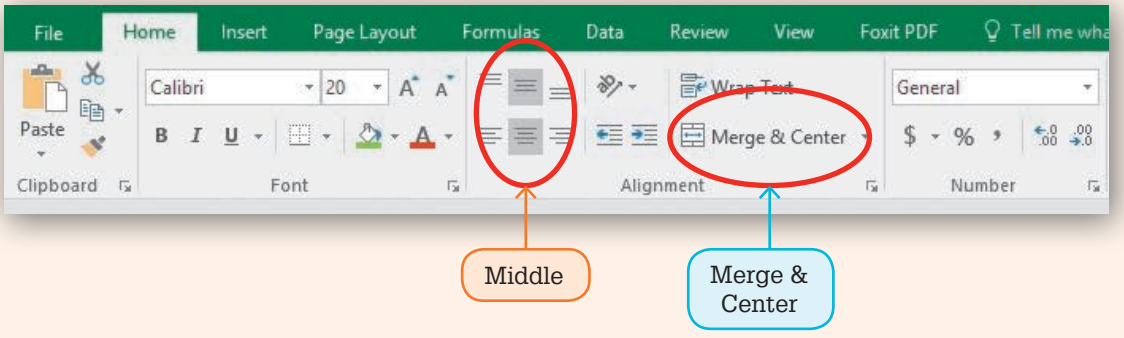


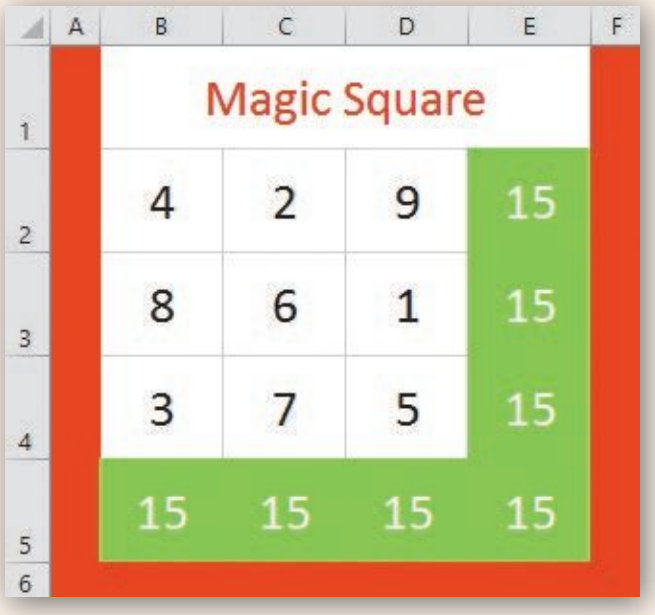


8 A heading can be merged and centred across a range of cells. Select cells B1 to E1 then click on the **MERGE & CENTER** button on the **HOME** tab.

9 Aligning cell contents can be done both vertically and horizontally. Select all the cells then click on the **MIDDLE ALIGN** and **CENTER** buttons to put all text and data in the centre of each cell.

For Google Sheets, use the **MERGE CELLS**, **HORIZONTAL ALIGN** and **VERTICAL ALIGN** buttons to achieve the same effect.





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Spreadsheets exercise 9

Formatting 2

Skills practised
- Changing font style, size and colour
- Aligning cell contents
- Cell shading

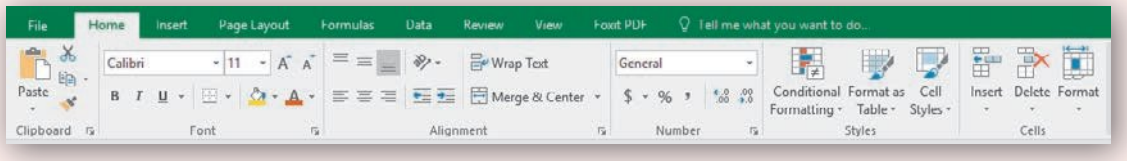
1 Open the file Order form, which you created in Exercise 6 or create the spreadsheet shown below on the left.

2 Delete the text in rows 3 and 4, and re-enter it in rows 1 and 2, as shown below on the right.

3 Highlight the two rows and click on the **DELETE** rows button.

4 Highlight the columns B and C and click on the **DELETE** columns button (the same button – just depends on what you have selected).

5 The font size and type can be changed to highlight different areas of the spreadsheet. Headings usually have a larger font and can be bold. The colour of data can also be changed.



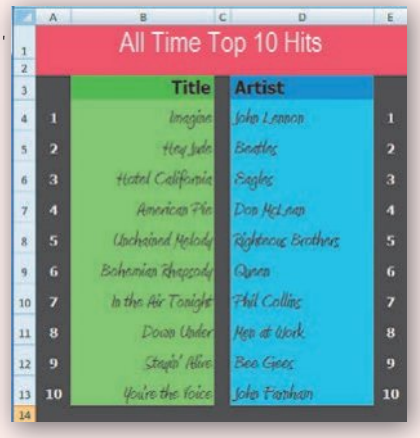
	A	B	C	D	E	F
1	Canteen Order Form					
2						
3	Name	Jimmy Jamms				
4	Year	9 Red				
5						
6	Item			Qty	Price	Total
7					$	$
8	Cheese sandwiches			3	2.50	7.50
9	Stawberry milk			1	3.00	3.00
10	Red frogs			3	0.10	0.30
11	Apple			1	0.50	0.50
12						
13				Total		11.30
14				Money enclosed		20.00
15				Change		8.70
16						

	A	B	C	D	E	F
1	Canteen Order Form			Name	Jimmy Jamms	
2				Year	9 Red	
3						
4						
5						
6	Item			Qty	Price	Total
7					$	$
8	Cheese sandwiches			3	2.50	7.50
9	Stawberry milk			1	3.00	3.00
10	Red frogs			3	0.10	0.30
11	Apple			1	0.50	0.50
12						
13				Total		11.30
14				Money enclosed		20.00
15				Change		8.70
16						

6 Use Font Size, Type, Colour and Alignment to modify the way the list appears. Shading cells can distinguish headings and different areas of the spreadsheet.

7 Shade the headings and columns various colours to distinguish each area. (Extras: Open the file Hit List and format similar to that shown below. Open your other spreadsheet files and format them to look more interesting.)

	A	B	C	D
1	Canteen Order Form	Name	Jimmy Jamms	
2		Year	9 Red	
3				
4	Item	Qty	Price	Total
5			$	$
6	Cheese sandwiches	2	2.50	5.00
7	Stawberry milk	1	3.00	3.00
8	Red frogs	3	0.10	0.30
9	Apple	1	0.50	0.50
10				
11		Total		8.80
12		Money enclosed		10.00
13		Change		1.20



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8.6 Charts

A chart is a picture of data. An appropriate style of chart can improve the value of data by indicating trends and comparisons. Charting data can make the data more useful. If the right type of chart is chosen, clear trends can be displayed.

The simplest chart is a simple bar chart. The chart must begin with data. For example, a table showing the total sales for the past five years.

Year	2014	2015	2016	2017	2018
Sales ($)	1256895	1452687	1324568	1687594	1987542

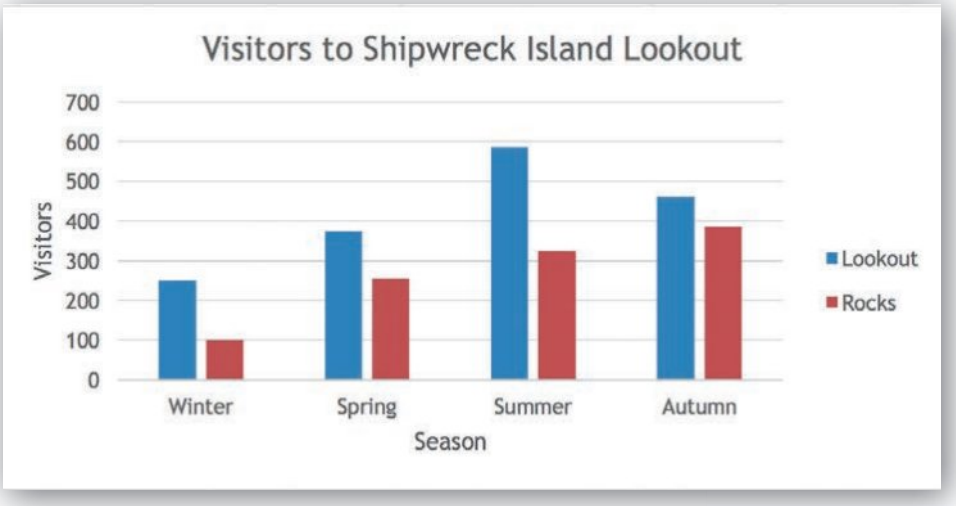
The values in this table can be plotted so that the sales for each year are clearly displayed. The upward trend in revenue is much clearer in a chart.

A chart is created using an X-AXIS and a Y-AXIS. The X-AXIS is the horizontal axis. In this chart the years are the categories on the X-AXIS. The Y-AXIS is used for the measurement of sales.

Chart types

There are various chart types that can be used to create charts. The various types give a different view of the data:

- Column: The column chart is useful for displaying the value of an item or items in a category.



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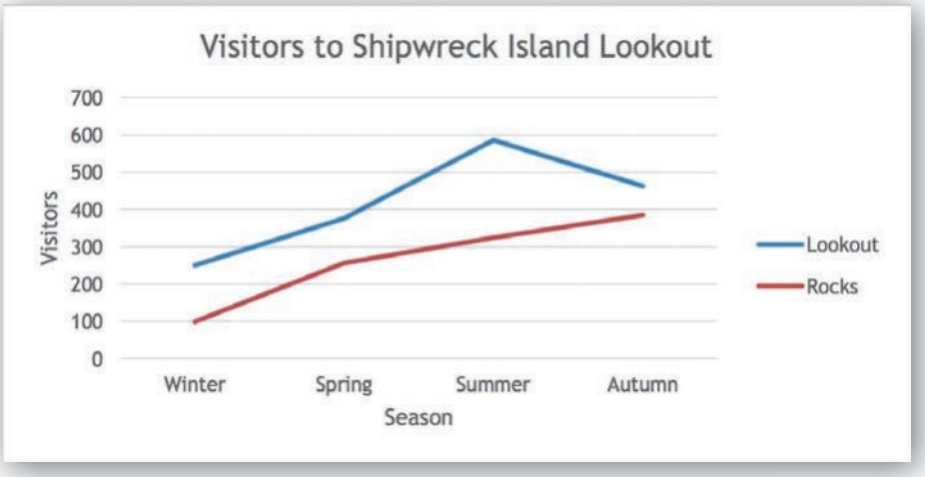
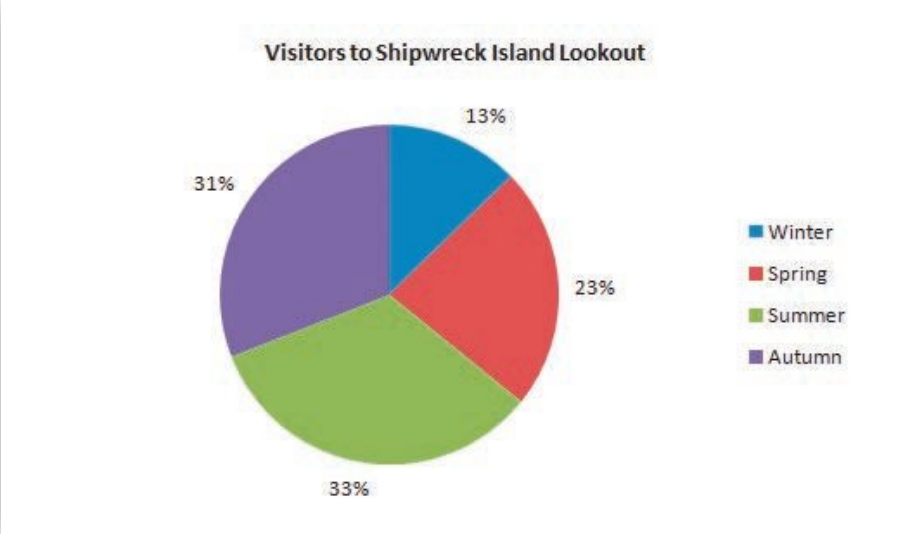
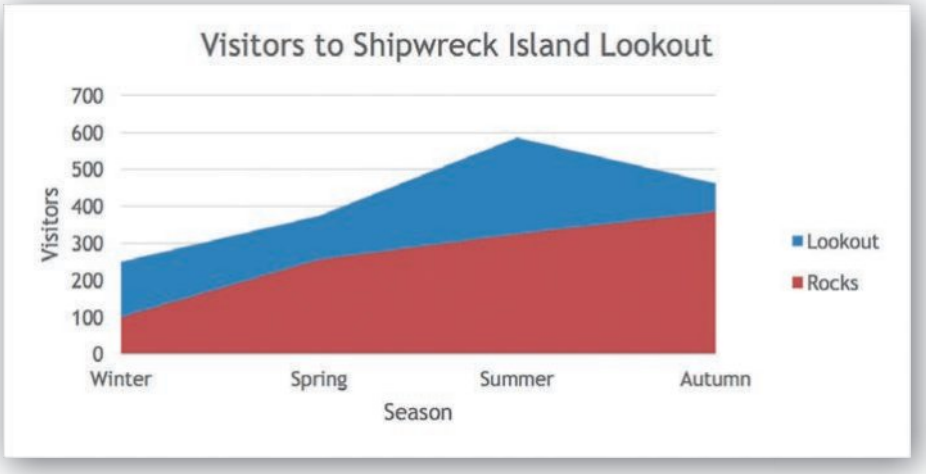
> Line: The line chart is useful for displaying the relationship between two values. It is used to indicate trends in values.



> Pie: The pie chart is useful to compare a small number of values relative to the whole.



> Area: The area chart is similar to a line chart with the area below the line filled in.



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Spreadsheets exercise 10

Creating a column chart

Skills practised
- Creating a spreadsheet
- Entering data
- Creating a chart
- Saving and closing

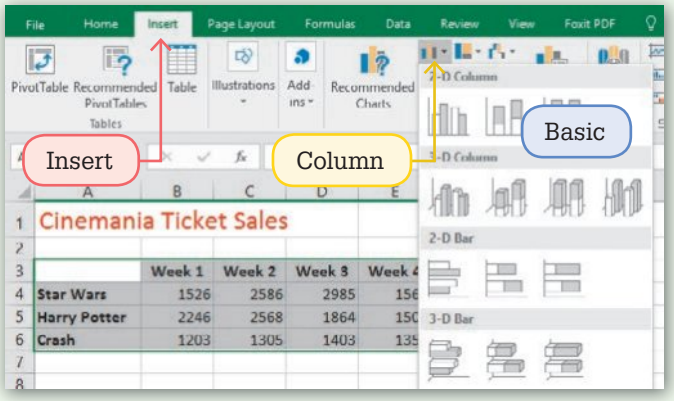
The local cinema keeps a tally of ticket sales to each film.

1 Create a spreadsheet and enter the data below.

	A	B	C	D	E
1	Cinemania Ticket Sales				
2					
3		Week 1	Week 2	Week 3	Week 4
4	Star Wars	1526	2586	2985	1562
5	Harry Potter	2246	2568	1864	1502
6	Crash	1203	1305	1403	1356

2 Select the table of text and data, cell range A3:E6, and click on the **INSERT** tab then the **COLUMN** button. For Google Sheets, use the **CHART** button then select a chart type and **INSERT**.

3 Select the basic 2-D column to create a bar chart that displays the number of ticket sales for each film each week.



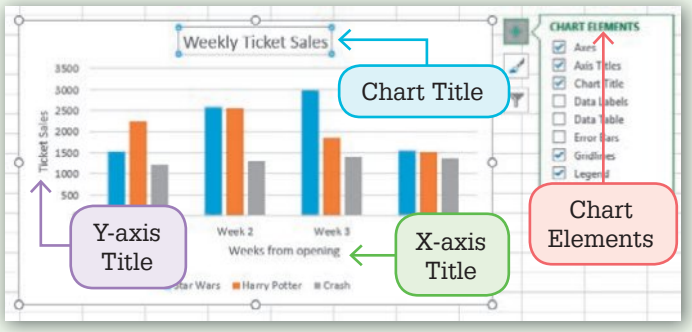
4 With the chart still selected, click on the **CHART ELEMENTS** button and **AXIS TITLES** so a tick appears.

5 On the chart, click on the **CHART TITLE** box and type `Weekly ticket sales` then press `<Enter>` to enter a title for the chart.

6 Click on the box for the X-AXIS title and type `Weeks from opening` then press `<Enter>`.

7 Click on the box for the Y-AXIS title and type `Ticket sales` then press `<Enter>`.

8 Save the file as Films.



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Spreadsheets exercise 11

Creating a pie chart

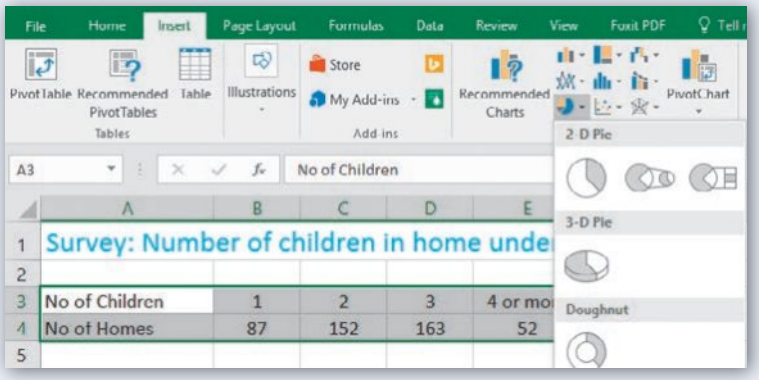
Skills practised
- Creating a spreadsheet
- Entering data
- Creating a chart
- Saving and closing

A survey of students revealed the following data about the number of children under 17 living at home.

1 Create a spreadsheet with this data.

	A	B	C	D	E	F
1	Survey: Number of children in home under age of 17					
2						
3	No of Children	1	2	3	4 or more	
4	No of Homes	87	152	163	52	
5						

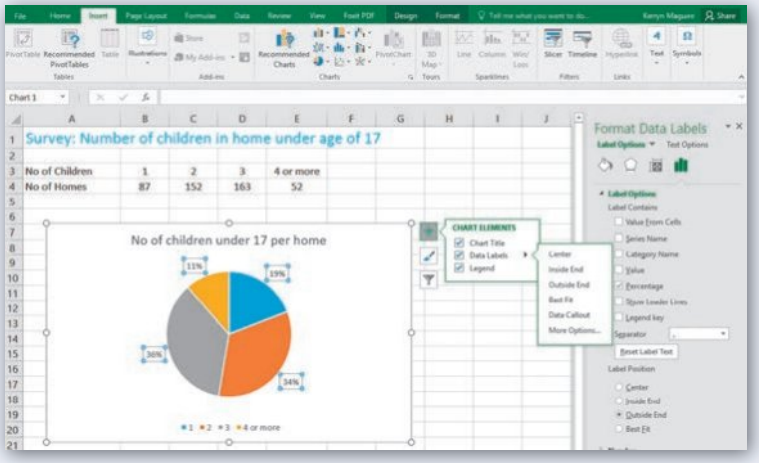
2 Create a pie chart that displays the percentage of homes with each category of number of children. Highlight the table of cells, then click on the **INSERT** tab. In Excel, click on the **PIE** button and choose the first **2-D PIE** option. For Google Sheets, click on the **CHART** button then choose the **PIE** chart option and **INSERT**.



3 The chart will be created with a title. Click into the **CHART TITLE** and edit the text to read as shown below.

4 With the chart still selected, click on the **CHART ELEMENTS** button. Click on the **DATA LABELS** button and the **MORE OPTIONS** at the end of the list, click on **PERCENTAGE** and **OUTSIDE END** or another of your choice, then click **CLOSE**.

5 Save the file with the name: Survey.



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Spreadsheets exercise 12

Creating a bar chart using only part of the data

Skills practised
- Creating a spreadsheet
- Entering data
- Creating a chart
- Saving and closing

So far you have used all the data available to create the chart. Sometimes the chart only requires part of the data. In this case you should only select the data you require for the chart. The spreadsheet below was a result of recording the number of visitors to two locations at a local coastal region.

1 Create this spreadsheet and save it with your student files under the name: Shipwreck.

	A	B	C	D	E
1	Vistors to Shipwreck Island Lookout				
2					
3		Winter	Spring	Summer	Autumn
4	Lookout	250	375	586	462
5	Rocks	100	256	325	385
6	Total	350	631	911	847

2 Create a chart to show the number of visitors to the Lookout each season. (Hint: Only select rows 3 and 4 for the data.)

3 Create a chart to show the number of visitors to the Rocks each season. (Hint: Only select rows 3 and 5 for the data. Select A3 to E3, hold down the <Ctrl> key and select A5 to E5.)

4 Create a chart that includes the number of visitors to each location for each season.

5 Create a pie chart that displays the percentage of total visitors each season.

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8.7 Using Goal Seek

The Goal Seek command is a very useful timesaving measure. For example, Goal Seek can help you calculate the percentage of your pay that you should save each week to reach a savings goal.

Spreadsheets exercise 13

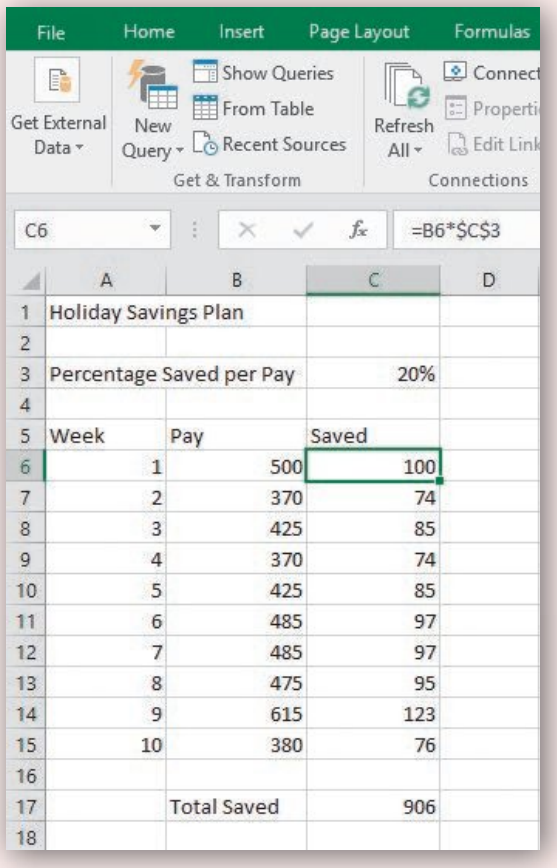
Using Goal Seek

In this exercise you will calculate the total savings, given a percentage saved each week. This is suitable for the **GOAL SEEK** function as the result (**TOTAL SAVED**) is directly dependent on the variable (**PERCENTAGE SAVED WEEKLY**).

Skills practised
- Creating a spreadsheet
- Entering formulas
- Using Goal Seek function

1 Start a **NEW** file and **SAVE** it as: Goal Seek. Enter the data and text as shown.

2 Use a formula to calculate the amount saved each week and the total saved. The formula in cell C6 should be =B6*C3. Suppose you want to save the specific amount of $2000 over 10 weeks. The amount to be earned each week has been estimated and entered. You could experiment with the percentage value to find the level of savings required, which would be a long and tedious process, or you could use Goal Seek to find the answer in seconds.



	A	B	C	D
1	Holiday Savings Plan			
2				
3	Percentage Saved per Pay		20%	
4				
5	Week	Pay	Saved	
6	1	500	100	
7	2	370	74	
8	3	425	85	
9	4	370	74	
10	5	425	85	
11	6	485	97	
12	7	485	97	
13	8	475	95	
14	9	615	123	
15	10	380	76	
16				
17		Total Saved	906	
18				

3 Click on C17, the cell that displays the **TOTAL SAVED**. Start here because we know the result we want for this cell: $2000.

4 Click on the **DATA** tab on the ribbon then click on the **WHAT IF ANALYSIS** button.

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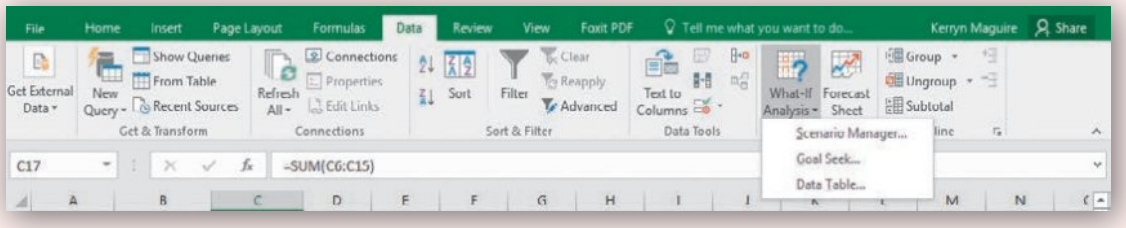
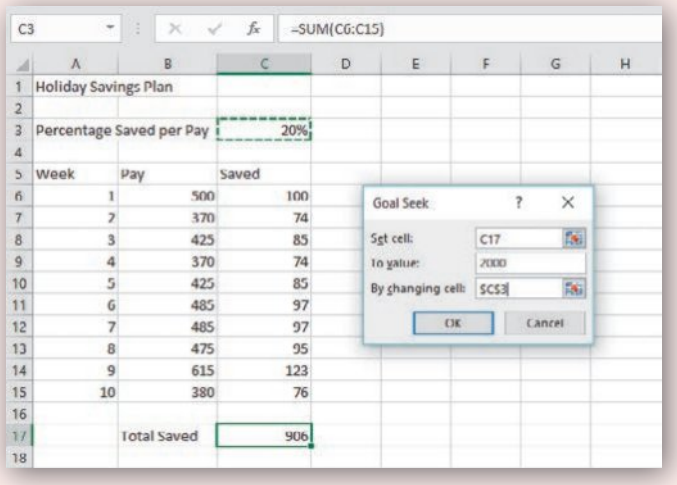
5 Click on the **GOAL SEEK** option that appears.



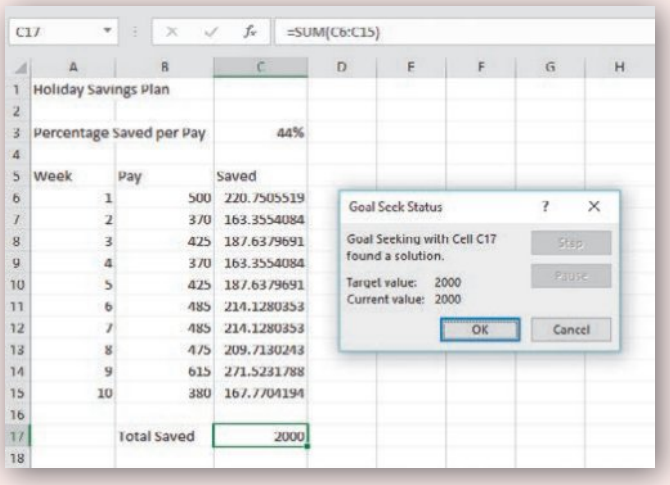
6 The **GOAL SEEK** dialog box appears as shown below. Click in the **TO VALUE** box and type 2000 as the amount to be saved.

7 Click in the **BY CHANGING CELL** box then click on the percentage cell, **C3**, as this is what will need to change to alter the amount saved each week.



8 Click on **OK**. Goal Seek tries different percentage levels until Total Saved of $2000 would be saved. A status message appears when a solution is found. To save $2000 you would need to save 44% of your wages each week.

9 Click on **OK** to accept the search results that are shown below.



10 Repeat steps 3 to 8 but using $1000 in the **TO VALUE** cell instead of $2000. What is the percentage required now?

11 Repeat the process with other savings goals of $5000, $10,000, $100 and $0, etc.

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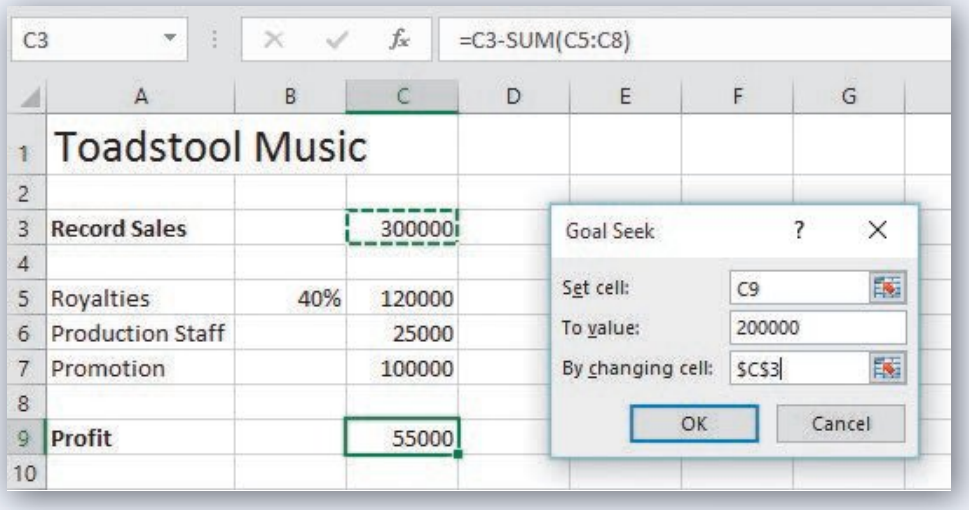
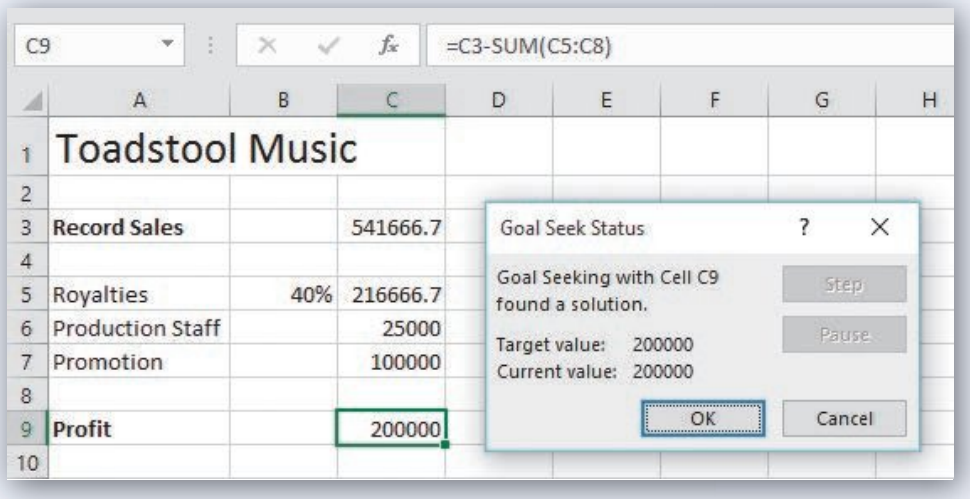
Spreadsheets exercise 14

Using Goal Seek to calculate sales and profit

Skills practised
- Using multiple worksheets
- Entering formulas
- Using Goal Seek function

1 Click on the next blank worksheet tab (e.g. Sheet2) at the bottom of the window.
2 Create the spreadsheet shown below.
3 Click on cell C5 and enter the formula to calculate **ROYALTIES =40%** (B5) multiplied by the **RECORD SALES** (C3).
4 Click on cell C9 and enter the formula for **PROFIT = RECORD SALES** (C3) minus the sum of **ROYALTIES**, **PRODUCTION** and **PROMOTION** Sum (C5:C7).
5 Click on cell C9, click on the **DATA** tab then the **WHAT IF ANALYSIS** button and click on the **GOAL SEEK** option.
6 Use Goal Seek to determine the amount of record sales to achieve a profit of $200,000. The Goal Seek function searches until it finds a sales amount so that when 40% is paid in royalties and the other fixed expenses are taken into account, the profit will be $200,000.





7 Repeat to find the sales required for a profit of: $100,000, $300,000, $500,000, or $0 (break even).

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Spreadsheets exercise 15

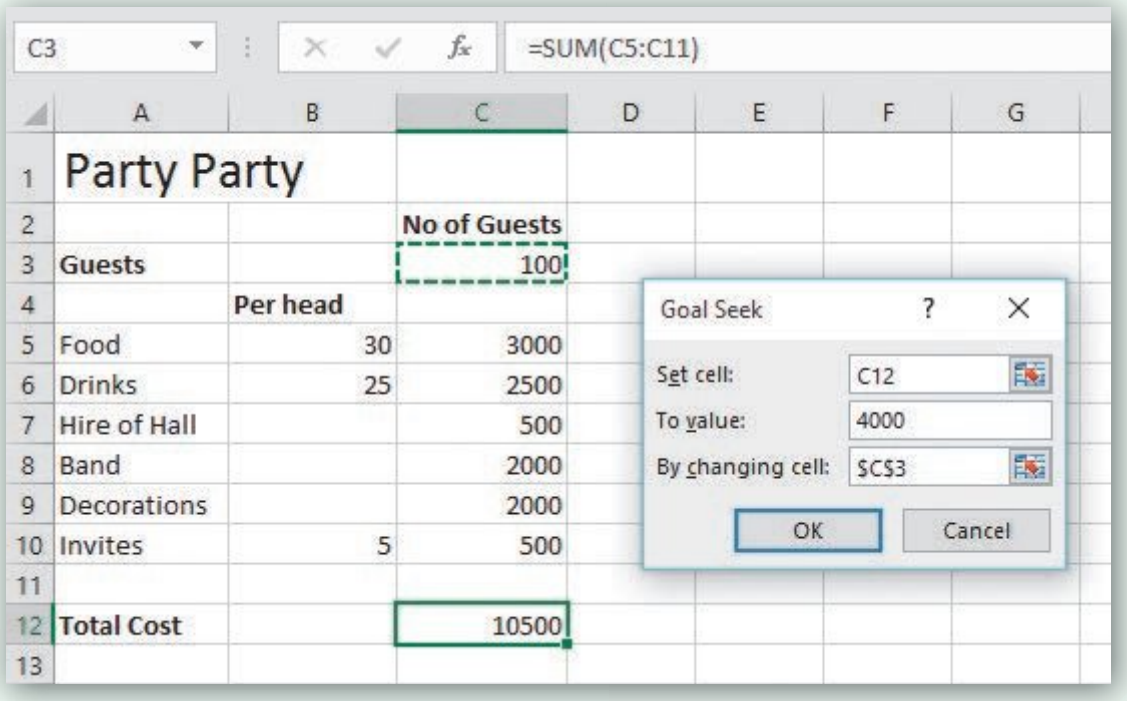
Using Goal Seek to find cost per head

Skills practised
- Entering formulas
- Using Goal Seek

1 Add a new blank worksheet and complete the spreadsheet below.

2 The total cost of the party is dependent on the number of guests. The costs of food, drink and invites are calculated by multiplying the number of guests by the cost per head of each item. The costs of the hall, band and decorations are fixed.

3 Use Goal Seek to find the number of guests that can be invited if the total cost is to be kept to $4000.



4 Try again for a total cost of $6000, then again for $10,000 and $20,000.

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SPREADSHEETS PROJECT 1

Lawnmower extraordinaire

You are starting a lawnmowing round to earn some extra money. You need to work out how much you will charge each customer for mowing their lawn. To work out a fee you have to determine the area of the customer's lawn. You charge 50 cents per square metre. You need a spreadsheet that will enable you to put in data for any customer and you will be able to calculate the charge.

Collect data

Use Mr Green's lawn and the other examples below to help you work out what is required:

> Mr Green's lawn is divided into the front lawn and back lawn. The front lawn measures 6 metres × 20 metres. The back lawn measures 15 metres × 23 metres.

> Mr Black's lawn is divided into the front lawn and back lawn. The front lawn measures 4 metres × 12 metres. The back lawn measures 20 metres × 32 metres.

> Mrs Plum's lawn is divided into the front lawn, side lawn and back lawn. The front lawn measures 8 metres × 24 metres. The side lawn is 4 metres × 15 metres. The back lawn measures 10 metres × 30 metres.

Define the solution

The spreadsheet also needs to include:

> the customer's name

> the length and width measurements for each section of lawn

> the calculated area in square metres of each section

> the charge for each section

> a total charge to the customer.

Implement the solution

Create the spreadsheet:

> Enter the data for Mr Green and save the file as Green.

> Open the file and enter details for Mr Black, saving the file with a new name Black.

> Open the Green file and enter details for Mrs Plum, saving the file with a new name Plum.

Evaluate, collaborate and manage

1. What problems did you have with working out the charge? Can you improve on your design?
2. How would you deal with lawns that had areas within them such as swimming pools and vegetable patches that you could not mow?
3. How could you set up the spreadsheet so you could easily change your charge per square metre of lawn?
4. Make adjustments if necessary to your spreadsheet.

A Spreadsheets Project 2 is available in the Interactive Textbook.

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Module 9

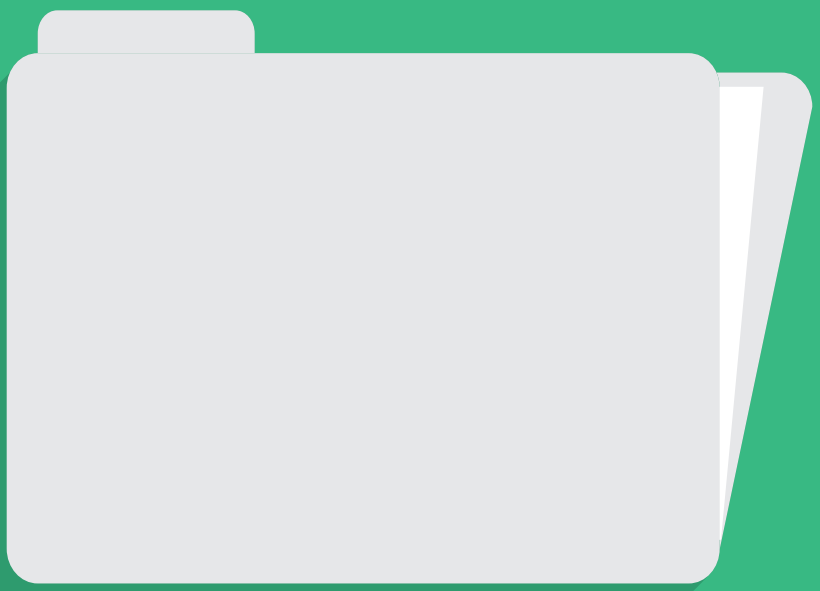
DATABASES

Programs featured for exercises:

Microsoft Access
FileMaker Pro

Additional instructions for Exercise 5 online using:

FileMaker Pro



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Teacher information

IT knowledge and skills covered in this module

- Introducing databases
- Database terms
- Creating a database
- Editing a database
- Sorting data
- Finding data
- Creating reports

Suggested further uses across the curriculum

- History (for organising research). Identify and locate relevant sources, using ICT and other methods (ACHHS208).
- Science (for organising research). Communicate ideas, findings and evidence-based solutions to problems using scientific language; and representations, using digital technologies as appropriate (ACSIS148).
- Economics and business (for saving and presenting information). Gather relevant data and information from a range of digital, online and print sources (ACHES022, ACHES033).

Alignment with the Australian Curriculum

ICT Capability elements covered

- Investigating with ICT
  - > define and plan information searches
- Creating with ICT
- Communicating with ICT
  - > collaborate, share and exchange
  - > understand computer mediated communications
- Managing and operating ICT

Other general capabilities covered

- Literacy
- Numeracy
- Critical and creative thinking
- Personal and social capability

Digital Technologies curriculum content in this module

Processes and production skills

- Acquire data from a range of sources and evaluate authenticity, accuracy and timeliness (ACTDIP025)
- Define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints (ACTDIP027)
- Design the user experience of a digital system, generating, evaluating and communicating alternative designs (ACTDIP028)
- Evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability (ACTDIP031)

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9.1 Data and information

What is data?

Data is simply a collection of characters (that is, letters, numbers and symbols) that, on their own, have no particular meaning. For example, the letters:

```
Thissentencemakesnosense
```

don't make much sense. They are just a series of letters. The numbers:

```
10052003
```

are just a series of numbers.

What is information?

When you do something to data – that is, process it – you convert it into information. Information is something that can be communicated and understood. For example, if we add spaces to the text above:

```
This sentence makes no sense.
```

we can understand what it means. If we add slashes to the numbers:

```
10/05/2003
```

we can recognise this as a date, possibly a birth date.

9.2 What is a database?

When data about a particular topic is stored it is said to be a database. A database program allows the data to be processed into information, something that can be communicated and understood.

Some databases that we use in everyday life are telephone books, dictionaries, atlases, bus timetables and so on. These can be online or in printed form.

Database terms

There are some important database terms that you will learn as you work through this topic.

Fields

Data within a database is usually divided into categories or sections called fields. The fields that the telephone book is divided into are:

```
Surname, Initials, Street Number, Street Name, Suburb, Telephone Number
```

These fields can vary in length, depending on how much data (characters) needs to be placed into them. For example, an Initials field does not need as much space as a Surname field. Fields can be set to different types depending on the data they need to contain. For example, fields that will contain names are set to text fields. Fields that will contain numbers are set to number fields.

Records

One complete set of fields is termed a record. For example, each subscriber's details in the phone book are a record. There are over 1,000,000 records in the Melbourne telephone book.

Files

A complete set of records is called a file. The phone book is divided into two files, white pages and yellow pages. The following diagram shows the different sections of an address file.

First name	Surname	Address	Phone number
John	Smith	25 Main Street, Belmont	52434866
Jill	Jones	101 High Street, Highton	52439022

Field names

Records

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9.3 Creating a database

Two of the common database programs are Microsoft Access and FileMaker Pro. When you create a database, the field names are entered followed by the field type that each field will contain; for some databases, the field width needs to be set.

The field type indicates the type of data that will be entered into the field. Examples of field types include: text, number, date and calculation. The field width sets how many letters or numbers will be allowed in that field.

Databases exercise 1

Creating a database

Skills practised
- Database files
- Adding fields
- Field types
- Field widths
- Entering records

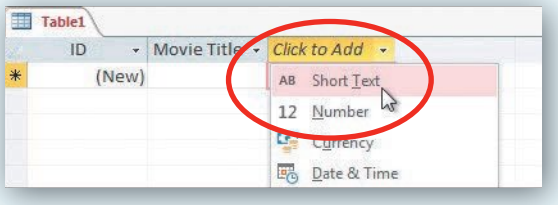
A database that allows an online video store to maintain a list of its available movies for watching directly or for downloading will be created.

1 Start your database program and select a **NEW (DESKTOP) DATABASE**.

2 Call the file: Movie Magic, set the location to your storage folder and select **CREATE** or **SAVE**.

Note: Database programs usually save the data automatically as you enter it, so you need to save the file first before entering the data.)

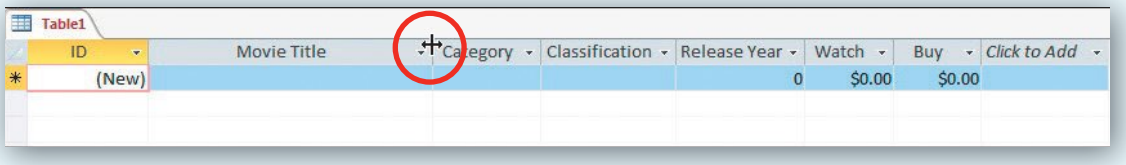
3 The following fields and field types need to be entered into the table. You can click on the <↓> or <+> icon next to the field label (click to add) and select the field type then enter the field name:



Field Name	Field Type
Movie Title	Short Text or Text
Category	Short Text or Text
Classification	Short Text or Text
Release Year	Number
Watch	Currency or Number
Buy	Currency or Number

Note: In FileMaker Pro, once the fields have been set, you can click on the arrow next to the field name and use **FIELD TYPE** to change the Release Year, Watch and Buy to **NUMBER**.

4 Adjust the field widths by dragging the right border of a field. Movie Title will need to be wider to account for long movie titles.



Note: The Field Widths can be changed when entering the data if you find that a field is not wide enough. Also, if you are using Microsoft Access, an ID field is automatically created to number the records.

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5 Click in the box under Movie Title and enter the following records. The **TAB** key can be pressed to move to the next field each time:

Mission: Impossible – Rogue Nation	Action	PG	2015	$2.50	$9.95
Shaun the Sheep Movie	Animation	G	2015	$2.50	$9.95
Midnight Special	Drama	M	2016	$4.00	$14.95
Trainwreck	Comedy	MA	2015	$3.00	$12.95
Hotel Transylvania 2	Comedy	PG	2016	$4.00	$14.95
Bridge of Spies	Drama	PG	2016	$4.00	$14.95
Avengers: Age of Ultron	Action	PG	2015	$3.00	$12.95

6 Check over the data.

9.4 Editing a database

One of the many advantages of using a database is that changes can be made to the data at any time. New records can be added, records can be deleted, or the data can be updated in some way.

Databases exercise 2

Editing a database

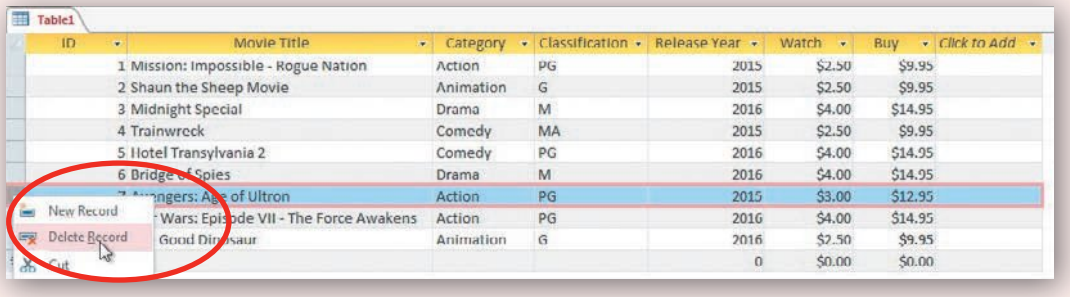
Skills practised
- New records
- Deleting records
- Editing records

1 Add the following records to your database from Exercise 1. You can do this by clicking in the blank box under the last Movie Title entry.

Star Wars: Episode VII – The Force Awakens	Action	PG	2016	$4.00	$14.95
The Good Dinosaur	Animation	G	2016	$2.50	$9.95

2 Add some of your favourite movies to the database if you wish to (no more than three).

3 The *Avengers: Age of Ultron* is no longer available. Delete this record from the database by clicking in the box to the left of it, then right click, select **DELETE RECORD** and select **YES** or **DELETE** in the warning box.



4 The following changes need to be made:
- **a** The classification of *Bridge of Spies* to M.
- **b** The prices of *Trainwreck* to $2.50 and $9.95.
- **c** The release year of *The Good Dinosaur* to 2015.

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9.5 Sorting data

Sorting is the process of arranging records into a particular order. You can arrange records into alphabetical, numerical or chronological (date) orders. The diagram to the right displays book records that have been sorted into subject area order.

This database is sorted into Subject Area order

Merryville High School

Book Acquisitions

March, 2017

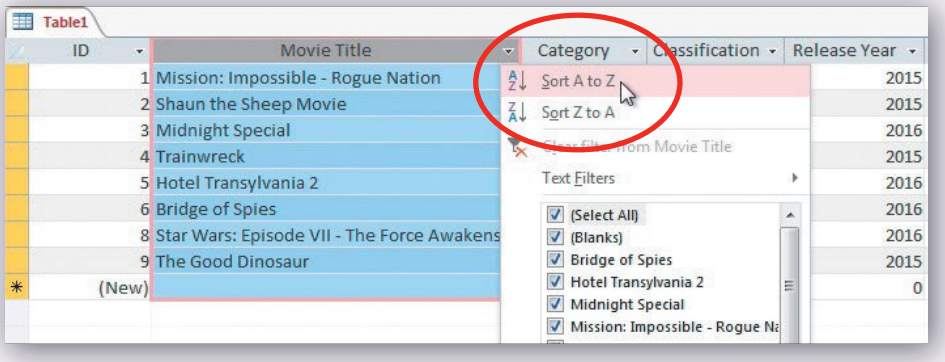
Title	Author	Subject Area	Received	Copies	Price	Amount
England My England	Daley	English	19 Feb, 2017	2	$25.00	$50.00
Stepping Out	O'Reilly	English	21 Feb, 2017	8	$15.55	$124.40
The French Revolution	Dujon	History	2 Mar, 2017	5	$28.50	$142.50
The Gold Rush	Harrison	History	18 Feb, 2017	12	$17.90	$214.80
Medieval Europe	Lawson	History	18 Feb, 2017	20	$18.50	$370.00
World War II	Stronsky	History	19 Feb, 2017	3	$23.50	$70.50
Maths in Action	Miller	Maths	27 Feb, 2017	25	$23.95	$598.75
Home Finance	Wilson	Maths	3 Mar, 2017	10	$19.95	$199.50

Databases exercise 3

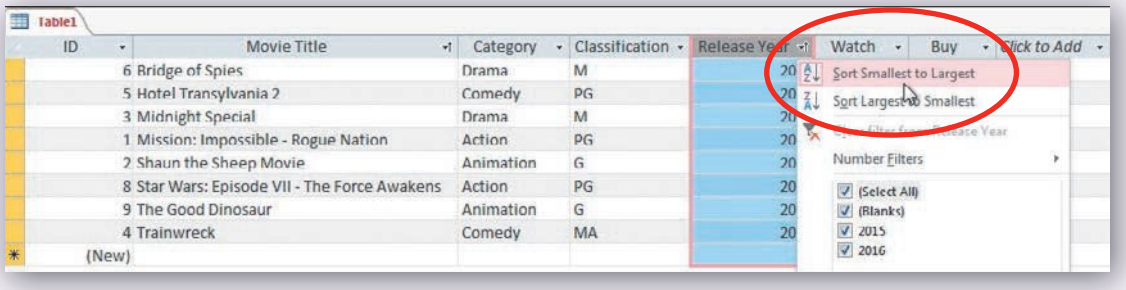
Sorting data

Skills practised
- Sorting alphabetically
- Sorting numerically
- Sorting chronologically
- Multiple field sorts

1 The Movie Magic database can be sorted into Movie Title order. Click on the arrow next to the Movie Title field and select **SORT A TO Z** or **SORT ASCENDING**. This should arrange the records so that the movie titles are in alphabetical order.



2 The database can be sorted into Release Year order. Click on the arrow next to the **RELEASE YEAR** field label and select **SORT SMALLEST TO LARGEST** or **SORT ASCENDING**. This should arrange the records so that the Release Dates are in order with the earliest releases listed first.



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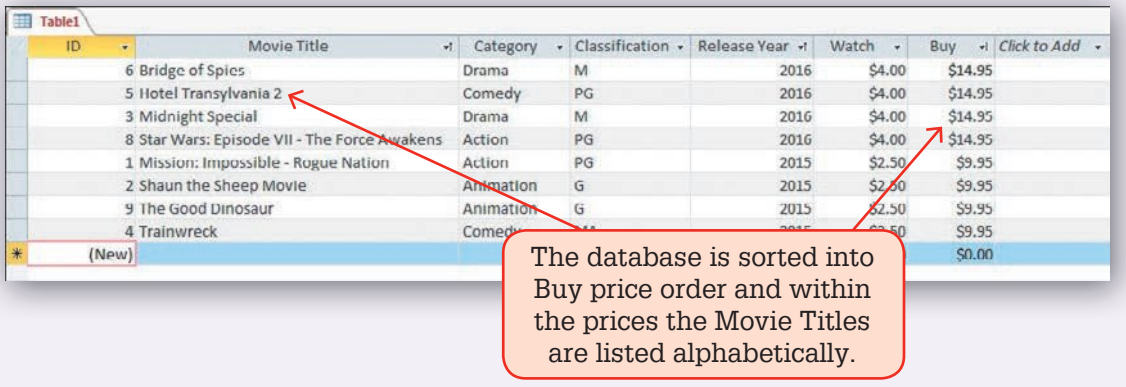
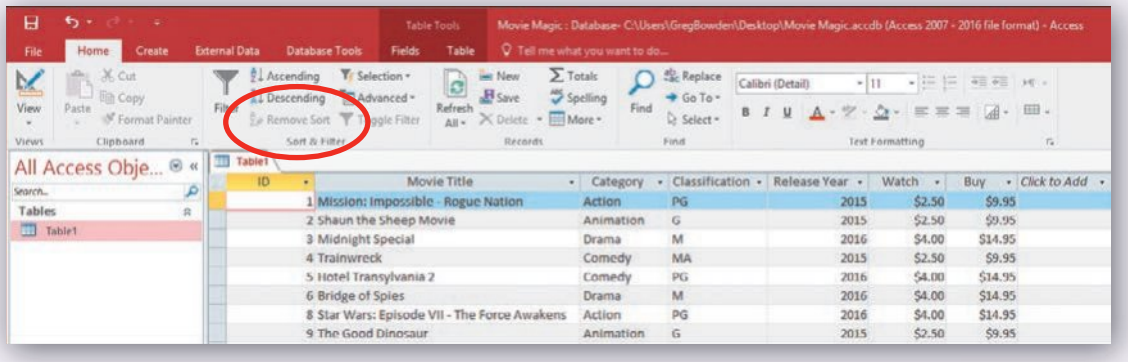
3 In Microsoft Access, try sorting the **MOVIE TITLE** into **A TO Z** or **SORT ASCENDING** order then the **BUY** prices into **LARGEST TO SMALLEST** or **SORT DESCENDING** order. This will place the $14.95 prices first with the Movie Titles in alphabetical order within them and the same for the $9.95 prices.



To create this sort in FileMaker Pro, click on the **SORT** icon in the toolbar, move **BUY** and **MOVIE TITLE** into the Sort Records box and select **SORT**.

4 The records can be returned to their original order. In Microsoft Access, click on the **REMOVE SORT** icon in the **HOME** tab of the ribbon. In FileMaker Pro, click on the **SORT** icon in the toolbar and select **UNSORT**.



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9.6 Finding data

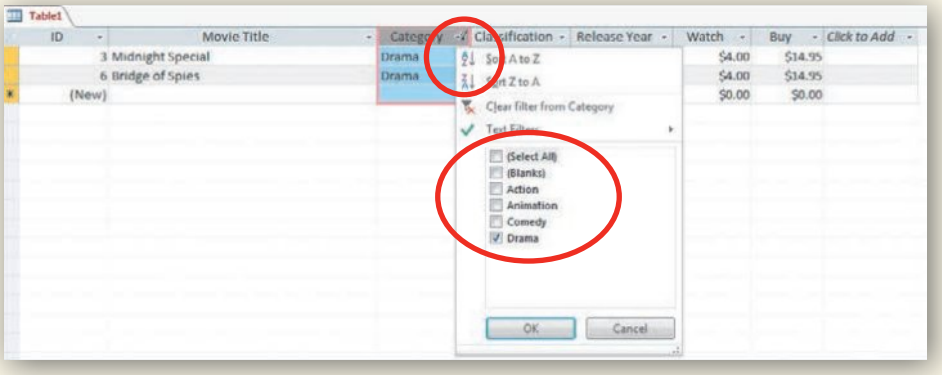
Databases allow you to display just part of the data. For example, a school might wish to just display details for the girls, or all the students who travel to school by bus, or those students who speak a language other than English.

Databases exercise 4

Finding data

Skills practised
- Finding data
- Showing all records
- Sorting records

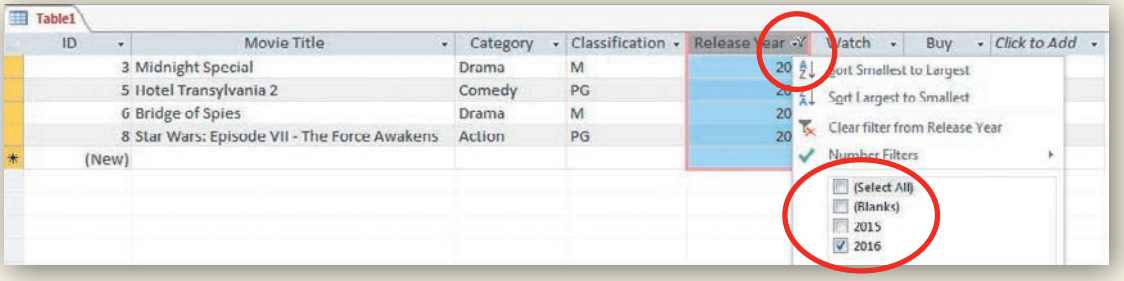
1 Let's say we wish to find all the drama movies. In Microsoft Access, click on the arrow next to the **CATEGORY** field label, turn off **SELECT ALL**, turn on **DRAMA** and select **OK**. In FileMaker Pro, right click on a **DRAMA** value and select **FIND MATCHING RECORDS**.



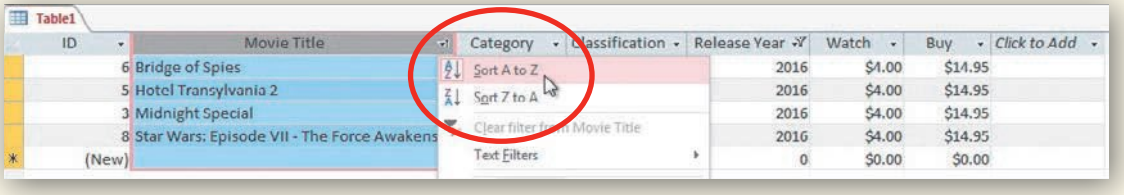
2 All the records are returned to the table by clicking on the **TOGGLE FILTER** icon in the **HOME** tab of the Microsoft Access ribbon or by selecting **SHOW ALL** in the FileMaker Pro toolbar.

Note: It is always best to return all the records to the screen after a search before carrying out a new search.

3 Try finding all the movies that were released in 2016.



4 Searched records can be sorted. Sort all the 2016 records into Movie Title order.



5 Return all the records to the screen and unsort them.

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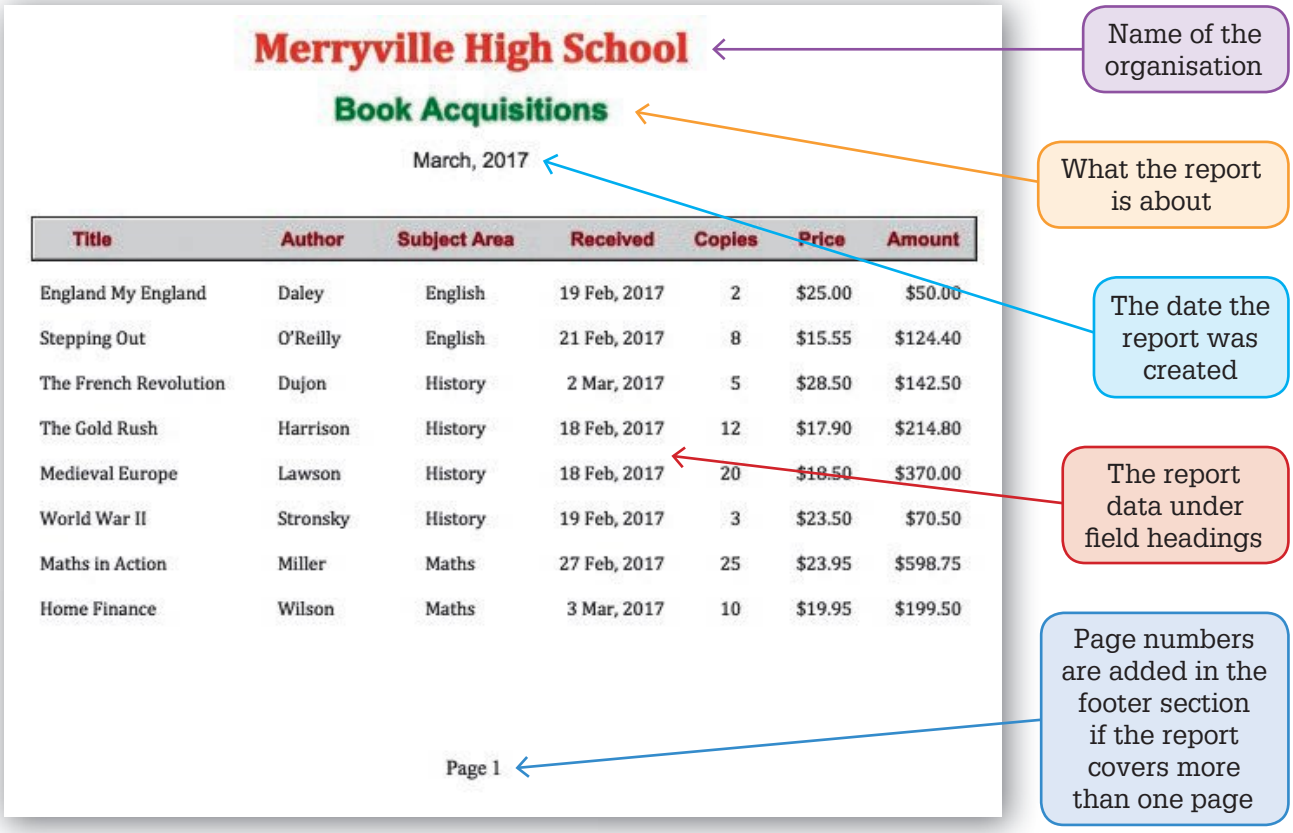
9.7 Creating reports

When information is printed from a database, it is usually in the form of a report. Reports display the information in a concise and clear way so that the data is easy to understand. Reports can display all the data, or just sections of the data, but each database program has its own way of creating reports.

In general, reports should have:

- Title (or main heading): This is usually the organisation's name.
- Subheading: This is usually what the report is about.
- Current date: This is so the reader of the report can clearly see how recent the database is. It would be of little use reading a report of prices that was done 10 years ago and, because no date was provided, thinking those prices referred to today's prices.
- Page numbers: These are required if the report covers more than one page. Page numbers should be included at either the top or the bottom of the report.

The following diagram provides an example of a database report.



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Databases exercise 5

Creating reports

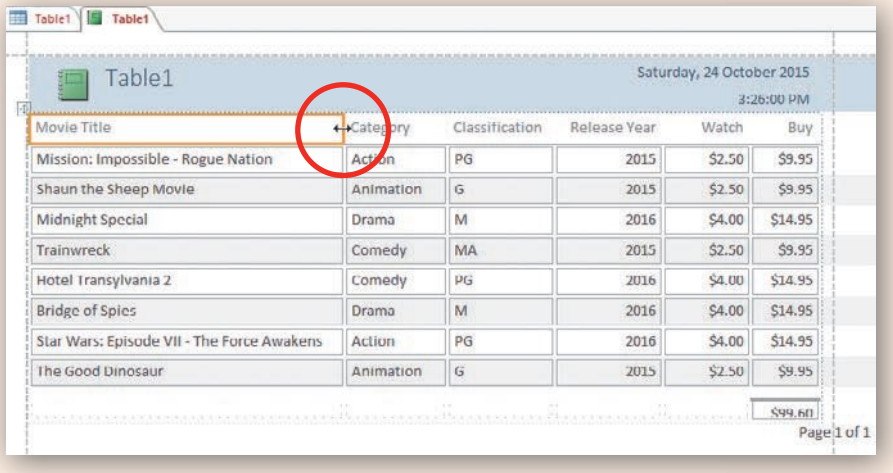
This exercise describes creating a report in Microsoft Access. (If you are using FileMaker Pro, there are instructions for creating the report that can be downloaded from *Cambridge GO* or the Interactive Textbook).

Skills practised
- Creating a report
- Deleting columns
- Column widths
- Formatting records
- Adjusting headers
- Previewing reports

1 In the **CREATE** tab of the ribbon, click on the **REPORT** icon, save the table as: Table1 if asked and the report is created.

2 The ID field can be removed. Right click on the ID field label and select **DELETE COLUMN**.

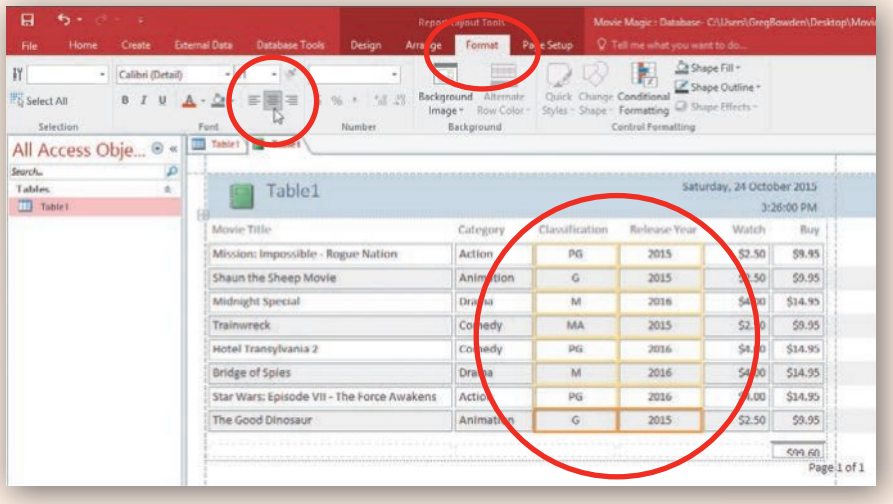
3 The column widths can be adjusted. Click on each field label in turn then move the pointer over its right border and drag the border to increase or decrease the width so that the data fits neatly in each column.



Movie Title	Category	Classification	Release Year	Watch	Buy
Mission: Impossible - Rogue Nation	Action	PG	2015	$2.50	$9.95
Shaun the Sheep Movie	Animation	G	2015	$2.50	$9.95
Midnight Special	Drama	M	2016	$4.00	$14.95
Trainwreck	Comedy	MA	2015	$2.50	$9.95
Hotel Transylvania 2	Comedy	PG	2016	$4.00	$14.95
Bridge of Spies	Drama	M	2016	$4.00	$14.95
Star Wars: Episode VII - The Force Awakens	Action	PG	2016	$4.00	$14.95
The Good Dinosaur	Animation	G	2015	$2.50	$9.95
					$99.60

4 Click on the first classification value then hold down the <Shift> key and click on the last Release Year value to highlight all the values.

5 In the **FORMAT** tab of the **REPORT LAYOUT TOOLS** in the ribbon, click on the centre icon to centre the values.



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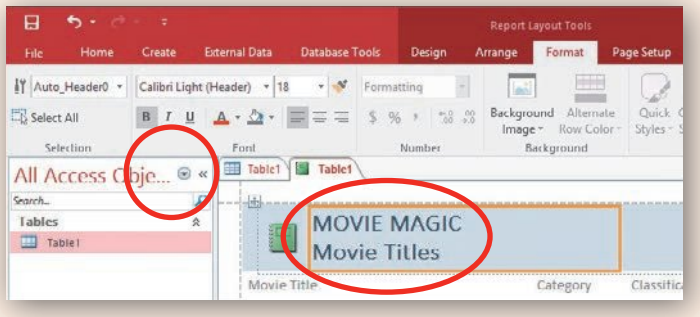
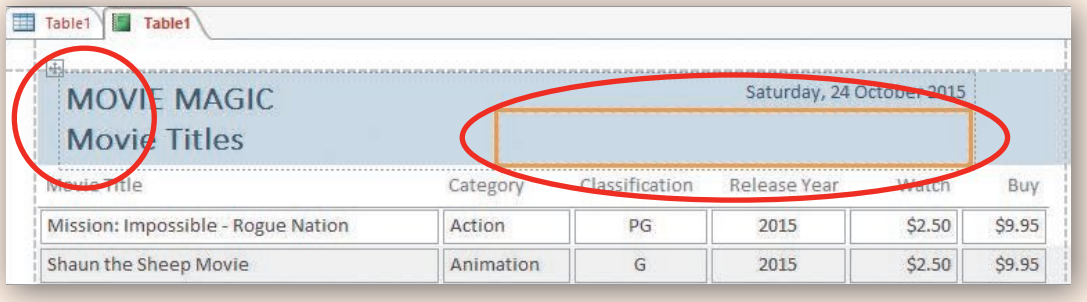
6 Highlight the report title and enter `Movie Magic` then hold down the `<Shift>` key, press `<Enter>` to move the cursor to a new line and enter `Movie Titles`.

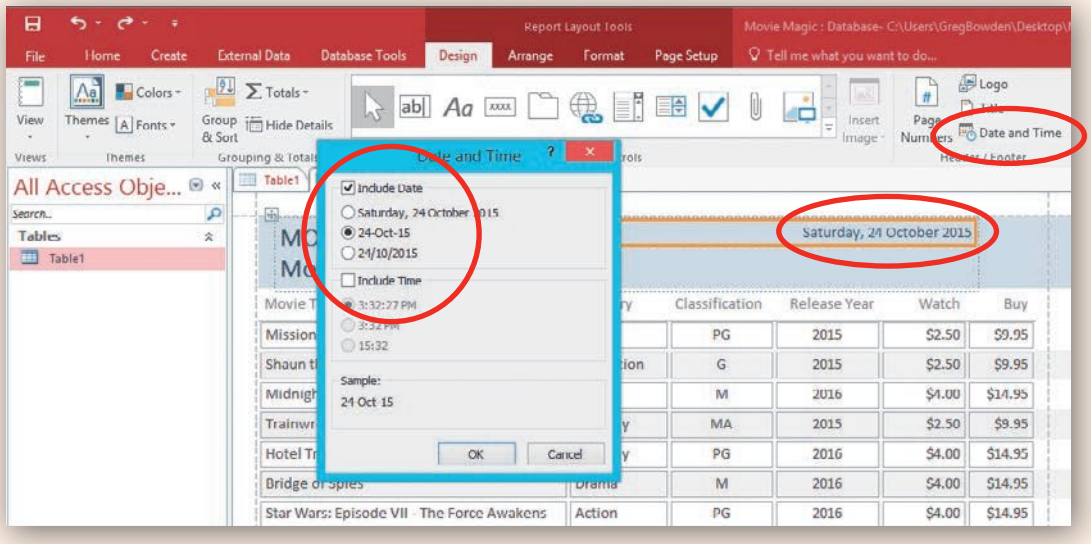


7 Click on the **BOLD** icon in the ribbon to set the text to bold.

8 Click on the icon next to the heading and delete it – it is a placeholder to insert a company logo – then click on the time box and delete it.



9 Select the Date box in the report, open the **DESIGN** tab of the **REPORT LAYOUT TOOLS** in the ribbon, select the **DATE AND TIME** option. Change the date format to the second option, turn off the **INCLUDE TIME** and select **OK**.



Note: The right border of the Date box can be dragged to the right to align it with the right edge of the table.

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10 This is a one-page report, so page numbers are not required. Click on the **PAGE NUMBER** box and delete it.

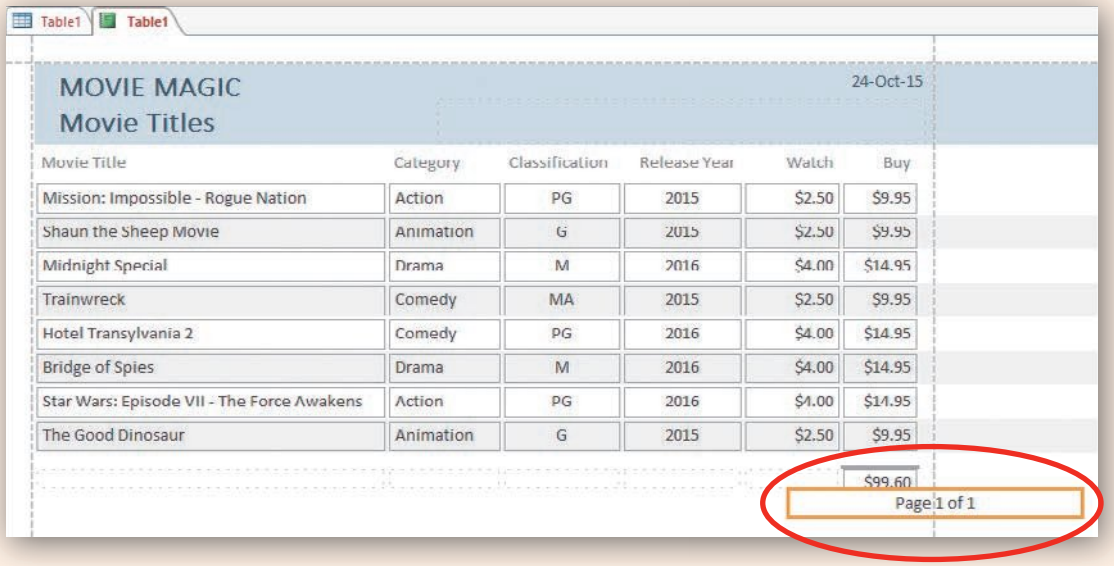


Table1 Table1

MOVIE MAGIC
Movie Titles

24-Oct-15

Movie Title	Category	Classification	Release Year	Watch	Buy
Mission: Impossible - Rogue Nation	Action	PG	2015	$2.50	$9.95
Shaun the Sheep Movie	Animation	G	2015	$2.50	$9.95
Midnight Special	Drama	M	2016	$4.00	$14.95
Trainwreck	Comedy	MA	2015	$2.50	$9.95
Hotel Transylvania 2	Comedy	PG	2016	$4.00	$14.95
Bridge of Spies	Drama	M	2016	$4.00	$14.95
Star Wars: Episode VII - The Force Awakens	Action	PG	2016	$4.00	$14.95
The Good Dinosaur	Animation	G	2015	$2.50	$9.95
					$99.60

Page 1 of 1

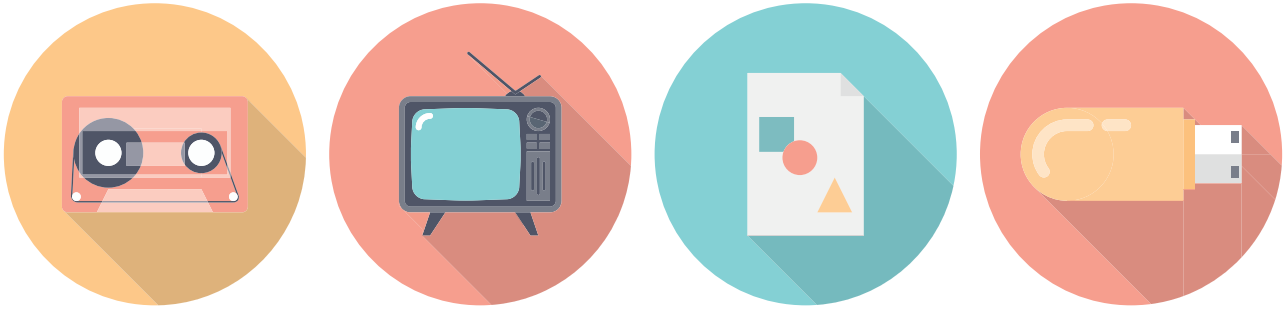
11 The report is set to display a total for the last number field. In this case it is not needed, so click on the total and delete it then delete the line that is above it.

12 Use the **FILE** tab in the ribbon to select **PRINT** then **PRINT PREVIEW** to view the report on screen and print a copy if your teacher wants you to or close the preview using the **CLOSE PRINT PREVIEW** icon in the ribbon.

13 Close the report by clicking on the **CLOSE BOX** (x) at the right of the tab bar and save it as: Movie List.

Note: The one database can have numerous different reports. You can copy a report file in the All Access Objects pane then delete some of the columns in the pasted report to create a different report, and you can sort or search for data within a report by right clicking on a column.

14 Print a copy of the report if your teacher requires you to.



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DATABASES PROJECT

Old actors database

Your grandfather is a lover of old movies. You can't see the attraction, but you have decided for his birthday to create a database of trivia about old actors for him. The database will require the following fields: First Name, Last Name, Real Name, Year Born, Country and Number of Academy Awards.

When the data has been entered, a report will need to be created to show:

> All the records sorted in alphabetical order by Last Name.
> Just the actors born in the USA.
> Just the actors born before 1920.

Collecting the data

Some data is displayed at the end of this project that you can use. You might like to research a few extra actors and share them with other students in the class.

Defining the solution

> Plan the field types that will be required and draw a field list table referring to the one in Exercise 1.
> Draw a thumbnail sketch of the report that you will create. Include the headings and subheadings that will be required, the fonts and sizes that you intend to use, the width of the columns or fields, how the report will be sorted and what searches will be required, etc.

Implementing

Create the new blank database, enter the fields and then enter the data shown below. Create the reports, sort them into the required order, carry out the required searches and print copies of the reports.

Evaluating, collaborating and managing

1 How many actors have won an Academy Award?
2 Which actor has won the most Academy Awards?
3 What extra fields do you think your grandfather might want to add to the database?
4 What will be the advantages to your grandfather of having this data in a database?

Old actors data

First Name	Last Name	Real Name	Year Born	Country	Number of Academy Awards
John	Wayne	Marion Morrison	1907	USA	1
Marilyn	Monroe	Norma Jeane Baker	1926	USA	–
Cary	Grant	Archibald Leach	1904	UK	–
Rock	Hudson	Roy Scherer	1925	USA	–
Judy	Garland	Frances Gumm	1922	USA	2
Boris	Karloff	William Pratt	1887	UK	–
Doris	Day	Doris Von Kappelhoff	1924	USA	–
Mickey	Rooney	Joe Yule Jr.	1920	USA	1
Charles	Bronson	Charles Buchinsky	1921	USA	–
Lauren	Bacall	Betty Perske	1924	USA	1
Kirk	Douglas	Issur Danielovitch	1916	USA	–

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Module 10

ALGORITHMS AND PROGRAMMING

Program featured for exercises:

Scratch

ISBN 978-1-316-62393-0

Teacher information

IT knowledge and skills covered in this module

- Algorithms
- Branching
- Computer programming
- Coding
- Animating in Scratch

Suggested further uses across the curriculum

- Mathematics (for a range of applications across the maths curriculum). Design and implement mathematical algorithms using a simple general purpose programming language (VCMNA254). Use algorithms and related testing procedures to identify and correct errors (VCMNA282).

Alignment with the Australian Curriculum

ICT Capability elements covered

- Creating with ICT
- Communicating with ICT
  - collaborate, share and exchange
  - understand computer mediated communications
- Managing and operating ICT

Other general capabilities covered

- Numeracy
- Critical and creative thinking

Digital Technologies curriculum content in this module

Processes and production skills

- Define and decompose real-world problems taking into account functional requirements and economic, environmental, social, technical and usability constraints (ACTDIP027)
- Design algorithms represented diagrammatically and in English and trace algorithms to predict output for a given input and to identify errors (ACTDIP029)
- Implement and modify programs with user interfaces involving branching, iteration and functions in a general-purpose programming language (ACTDIP030)

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10.1 What are algorithms?

An **algorithm** is a sequence of steps that, when followed, leads to the solution of a problem. It has a defined set of inputs and delivers an output. Each step in the algorithm leads to another step or completes the algorithm.

Through this module, you will explore the purposes of algorithms as well as think about the design, analysis and implementation of your own algorithms.

algorithm
Step-by-step procedures required to solve a problem. An algorithm may be described in many ways. Flowcharts are often useful in visualising an algorithm.

Finding solutions to problems

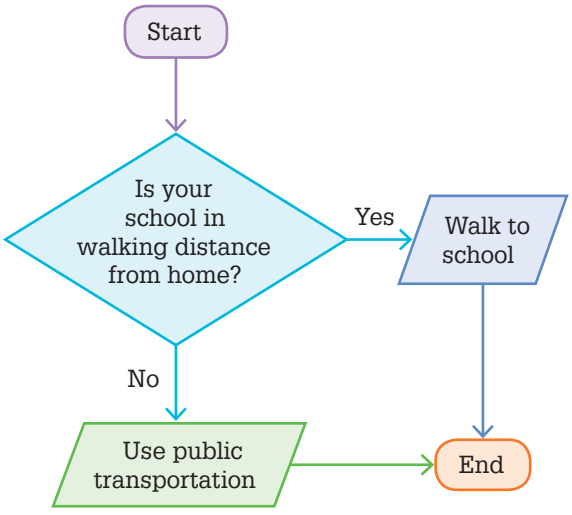
How do people work through real-world problems in a systematic and logical way? For starters, have you ever followed the steps in a recipe? Or, have you ever written or followed a shopping list? This is the recognition of a problem or requirement. The requirement – to purchase a range of food items from the shop. The solution – writing a shopping list, which operates like an algorithm that lists the steps required to get the desired result (purchasing all the items on the list).

For example, the following algorithm for working out how to get from home to school is written in point form:

1. Is your school in walking distance from your house?
2. If so, walk to school.
3. If not, use public transport.

This gives us a very simple algorithm.

Another way to make an algorithm very clear is to visualise the algorithm using a flowchart. In the flowchart on the right, the diamond shape is a DECISION that creates **branching**. Branching results when a choice is made between one or more actions depending on the data provided and other conditions.



From this diagram a **structured English** version can be written, using very clear and specific language known as conditional, or **IF statements**.

branching
Making a decision between one of two or more actions depending on sets of conditions and the data provided.

structured English
The use of the English language to describe the steps of an algorithm in clear, unambiguous statements that can be read from start to finish.

IF statement
A conditional decision statement used to control the flow of a program.

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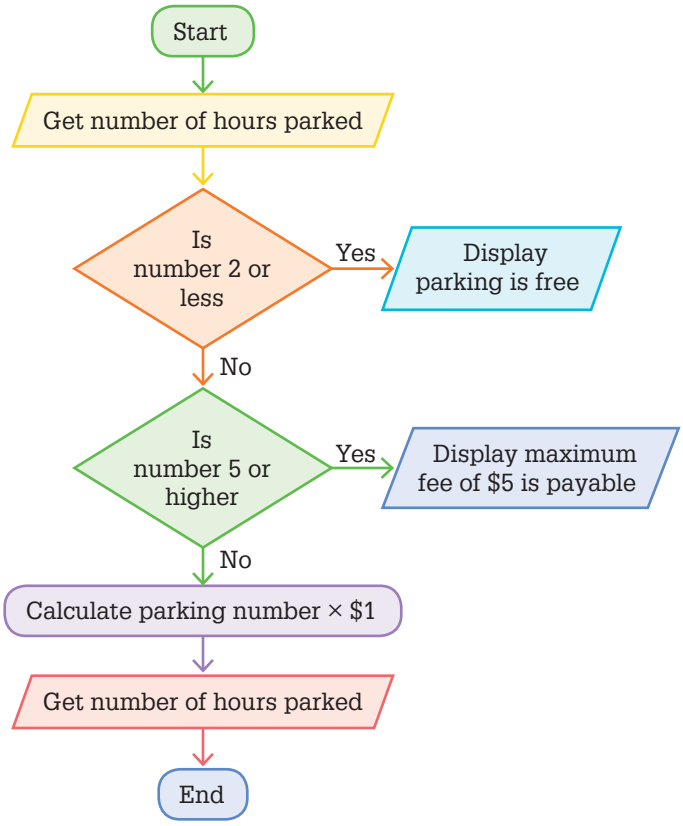
Using structured English, the flowchart on the previous page would look like this:

```
START
IF school is in walking distance from home
    THEN
    Walk to school
    ELSE
          Use public transportation
    ENDIF
END
```

Working out and displaying the charge for parking is another example of a simple algorithm. Like a mathematical equation, an algorithm precisely defines the steps a program takes to perform an operation.

1. What is the number of hours a customer has parked in the parking lot?
2. If the number is 2 or less, parking is free.
3. If the number is 5 or more, the maximum fee of $5 is to be charged.
4. If the number is more than 2 hours and less than 5, the fee is $1 times the number of hours.

The flowchart would look like this:



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The structured English would look like this:

```
START
Get number of hours parked
IF number 2 or less
    THEN
          Display "Parking charge is "Free""
    ELSE
          IF number 5 or higher
                THEN
                      Display "Maximum Parking fee of $5 is payable"
    ELSE
                Calculate parking fee result
                By multiplying number by $1
                Display the parking fee payable
          ENDIF
    ENDIF
END
```

Once an algorithm has been written in steps or drawn on a flowchart it must be tested to ensure it is working as expected. You should work through the algorithm with various input data to check this, and the data should include both expected and unexpected values. For example, work through the flowchart data where hours parked are the number 0, 1, 2, 3, 4, 6 or 10.

Algorithms outside the classroom

When you think about it, **algorithmic logic** surrounds us. For instance, anyone that has used navigation software has used an algorithm.

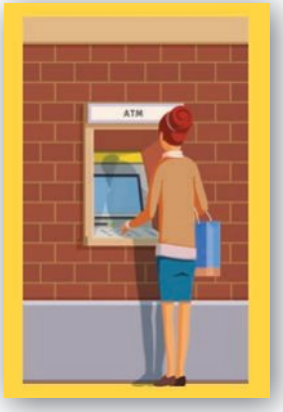
algorithmic logic
A logic behind breaking down computing problems and information systems into step-by-step processes in order to solve problems or achieve specified outcomes. It involves sequencing and abstraction and leads to algorithmic statements.

As we know, computers are a major part of our lives, and are used to run many different types of objects in the real world, which we really take for granted. Algorithms are the basic building blocks of the computer programs that run these machines and devices. Some real-world examples of algorithms at work include:

Example
ATMs and algorithms

Automated teller machines (ATMs) are computerised telecommunications devices that provide the clients of a bank with access to financial transactions in a public space without the need for a human bank teller. On most modern ATMs, the customer is identified by inserting a plastic ATM card with a magnetic strip or a plastic smart card with a chip that contains a unique card number and some security information such as an expiration date or Card Code Verification (CCV). Authentication is provided by the customer entering a personal identification number (PIN).

This information is the input for computer-based algorithms that process transactions at a rapid rate. The output is people's hard-earned savings – the correctness and efficiency of the computer code is therefore critical in the running of the ATM systems.



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Example
Algorithms and elevators

The electronic controller for a building lift runs an algorithm that delivers people to their destination based on which buttons are pressed both inside the lift car and in lift waiting areas. The algorithm must accept the requests (inputs: which buttons are pressed) and deliver a result (output: the action of the lift car) so that passengers travel to where they want to go in an efficient manner. A basic algorithm for a lift is as follows:

- Continue travelling in the same direction if at least one request exists in that direction.
- Remain stationary until new requests are made in either direction.

For multi-elevator systems, more complex algorithms are used. Requests are analysed and grouped so that requests for nearby building levels are serviced by one lift car, while other cars are left to service other levels. If lift waiting areas have two buttons (up or down) then this delivers more input to the algorithm. The algorithm can assess the direction of the request as well as the floor that the request was made. Further programming enhancements might cater for when a lift, stopping at multiple floors on one direction, is likely to be full. This may be the case early in the morning when many people head to work at a similar time.

An efficient lift algorithm will reduce waiting time for passengers and minimise wear and tear on the mechanics of the lift.

Algorithms and programming exercise 1

Class discussion

Discuss the two above algorithms used in important real-world applications. With so much at stake in both scenarios, can you predict the sorts of problems that would occur if the algorithms were not perfect?

Skills practised
- Understanding algorithms

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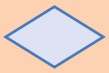
Flowchart symbols

Flowcharts for algorithms can get very complex. You may have already noticed the different shapes and when they are used.

Shape	Name	Description
	Terminal	Terminal: Can be a circle, oval or rounded rectangles. Start or End or similar phrase or a phrase that signals the start or end of a process.
	Flow line	An arrow coming from a symbol and ending at another symbol represents that control passes to the symbol the arrow points to.
	Input/Output	Represented as a parallelogram. Involves receiving data or displaying processed data.
	Decision	Usually a Yes/No or True/False test. Two arrows come out of this shape that should be labelled. One for Yes/True, the other for No/False. Usually down and to the right.
	Process	Represented as rectangles. This shape is used to show that something is performed, e.g. “Add 1 to X”, “Save changes”, “Replace identified part”.
	On-page connector	Generally represented with a circle to indicate where multiple control flows converge to a single exit flow. Mostly used to represent a loop, particularly after a decision. If two cross over but have no connection, a small semicircle is used to indicate that no connection is intended.

Tip: you can easily draw flowcharts using shape tools in Microsoft Word or Google Drawings. Refer back to Module 4: Drawing tools, Exercises 1–2 if you need a refresher.

Algorithms and programming exercise 2

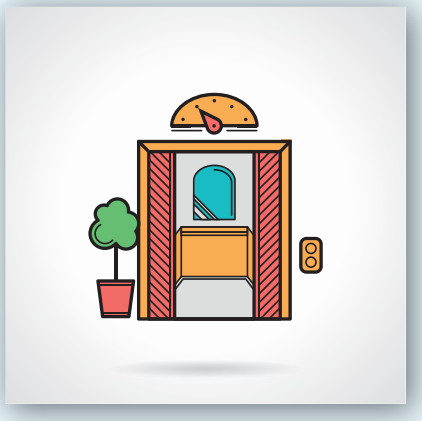
Algorithms, flowcharts and structured English

Skills practised

- Creating algorithms
- Drawing flowcharts
- Converting flowcharts into structured English
- Testing algorithms

Write an algorithm and draw a corresponding flowchart that works for each of the following procedures. Convert your flowcharts into structured English. Remember to test your results and work through them to make sure they work.

1. Make a toasted sandwich from scratch.
2. Buy new shoes from a shopping centre.
3. An elevator with one lift car.



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10.2 Computer programming and coding

In the world of IT, algorithms help people, such as app developers or computer programmers, **decompose** or break down a complex problem into smaller, more manageable tasks.

decompose
Separate a complex problem into parts to allow a problem to be more easily understood.

For software programmers, algorithmic thinking (working with algorithms and flowcharts) would be considered **design thinking** in the early stage of creating a program. For digital systems the creation of actual software requires **coding** in a programming language suitable for the system it is to be used on. One good thing is that algorithms can be written in what is known as 'pseudocode', which allows a programmer to easily transfer the algorithm into their preferred programming language.

As we know, computers run on binary code – written in 1s and 0s – which is very difficult for humans to work with. But just as people can understand different languages, computers can understand different languages (like Python, C#, C++, Perl, Visual Basic, Java, Javascript, Ruby and PHP, among others) which translate our instructions into binary.

Without coding, we wouldn't have websites to use, digital games to play, or special effects in the movies and shows that we watch. Although learning detailed coding is outside the scope of this book, through the use of algorithmic logic you can still create a digital solution to a problem.

design thinking
Use of strategies for understanding design problems and opportunities, visualising and generating creative and innovative ideas, and analysing and evaluating those ideas that best meet the criteria for success and planning.

coding
The process of writing computer software code.

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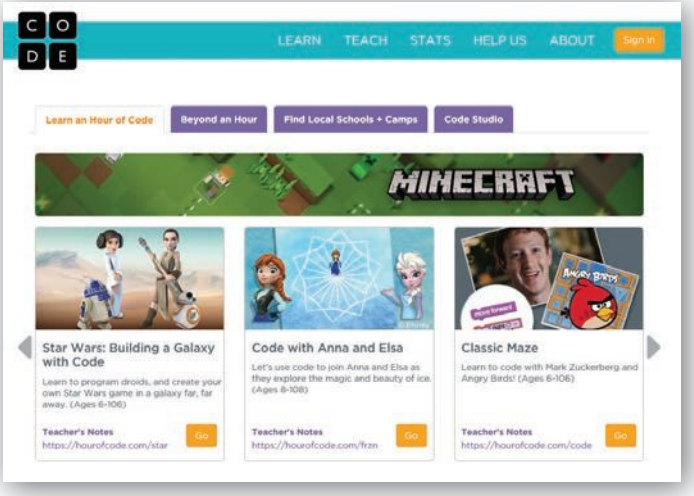
FACT BYTE

Mariner 1 was a NASA spacecraft with a mission to fly by the planet Venus in 1962. However, the craft exploded minutes after take-off. NASA's official excuse for the failure was 'the omission of a hyphen *in coded computer instructions* [which] transmitted incorrect guidance signals to Mariner spacecraft'. This cost the US government millions of dollars, and became known as the most expensive hyphen in history.

There are lots of areas on the internet where you can experience basic coding. Try the following websites:

- Code.org - has a combination of free and fee courses. Look up the Hour of Code for some fun with coding.
- Code Academy - has many lessons on how to code for free. You just have to sign up with an email and a password.
- Khan Academy - has some useful resources on coding in a range of programming languages.
- Gamemaker Studio - is a free program available for download where you can make your own games using an easy to use drag and drop interface!



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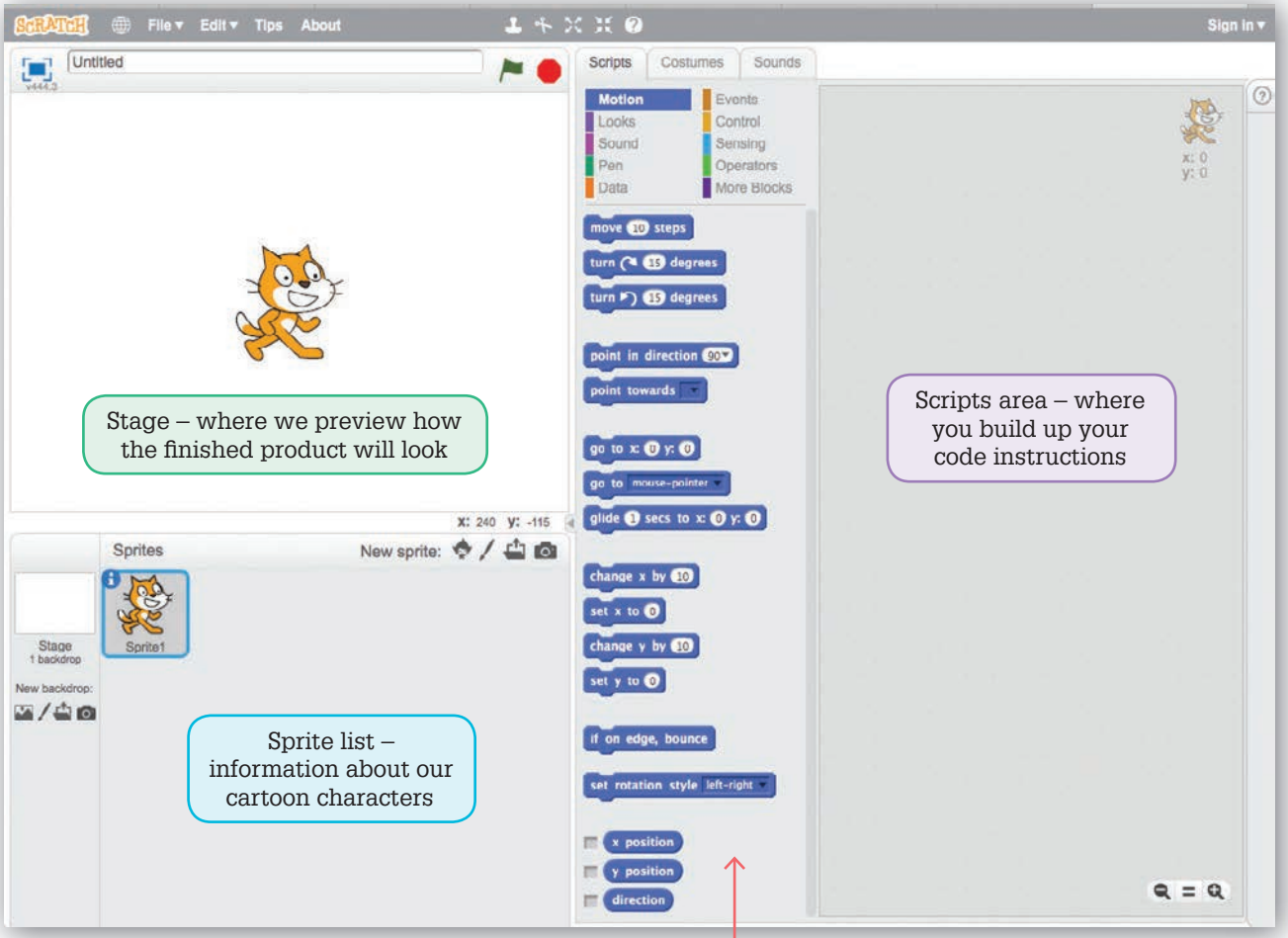
10.3 Introducing Scratch

Scratch is a popular program that enables you to program your own interactive stories, games and animations – and share your creations with others online. Scratch is designed especially for ages 8 to 16, but is used by people of all ages, in more than 150 different countries and available in more than 40 languages. Scratch is available for free online.

For our purposes, Scratch is a good introduction to programming, and shows us how we can use algorithmic thinking to create a digital solution. The program allows us to code different instructions, and test them on fun and friendly cartoon characters and environments. The Scratch workspace is explained below:



Scratch gives us an engaging introduction to how computer programs are coded.

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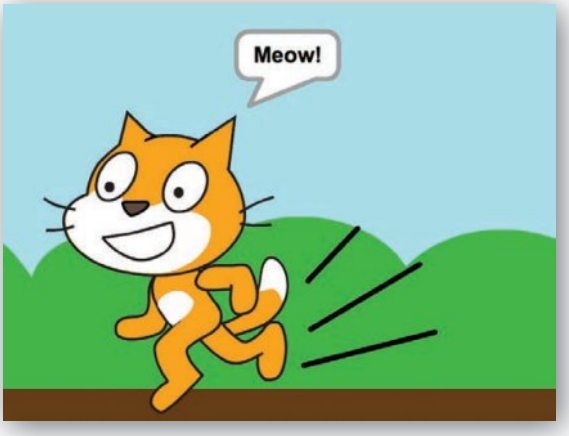
10.4 Simple coding in Scratch

In the following exercise, you will learn how to code a simple animated character in Scratch. The aim is to make a character walk, talk and play sounds.



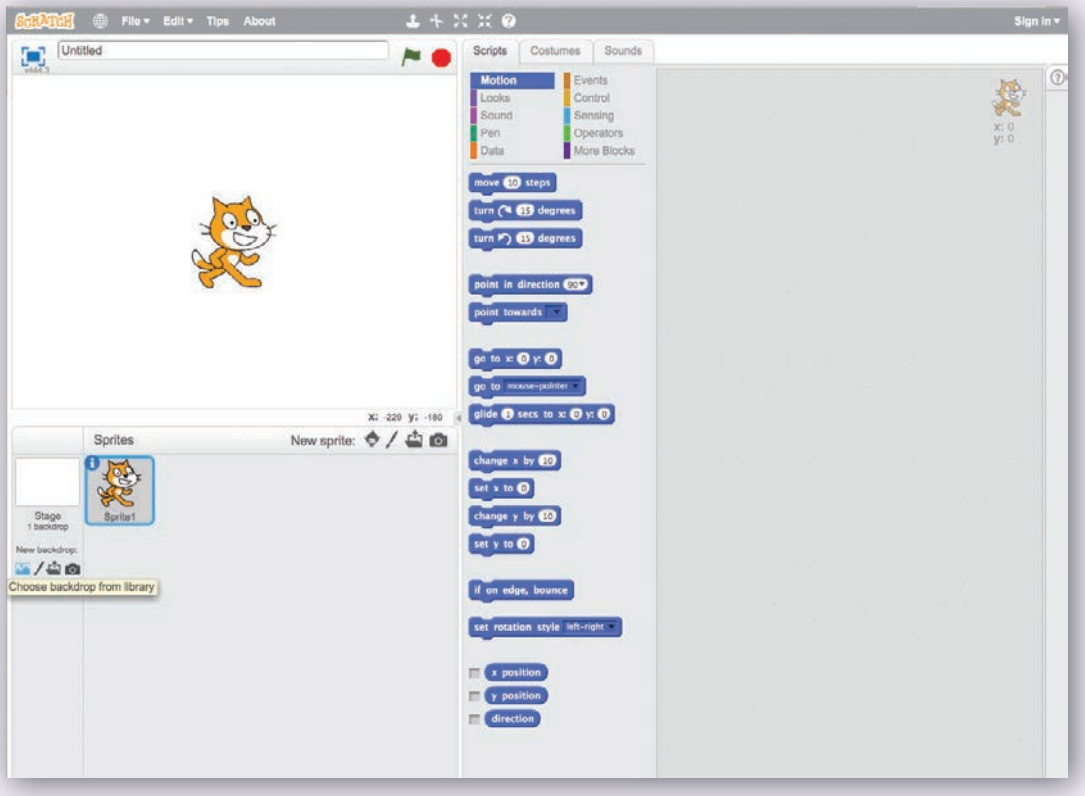
Algorithms and programming exercise 3

Using sprites in Scratch

Skills practised
- Creating a Scratch project
- Adding backdrops
- Modifying sprites
- Positioning sprites

1 Open up the Scratch Editor online. The smiling cat you can see is what is known as a sprite in Scratch. These are the 'characters' or 'things' that you can animate. The cat happens to also be the mascot for Scratch. We will come back to this sprite soon.

2 Let's next give our sprite a backdrop to roam around. Click on the **BACKDROP** button.



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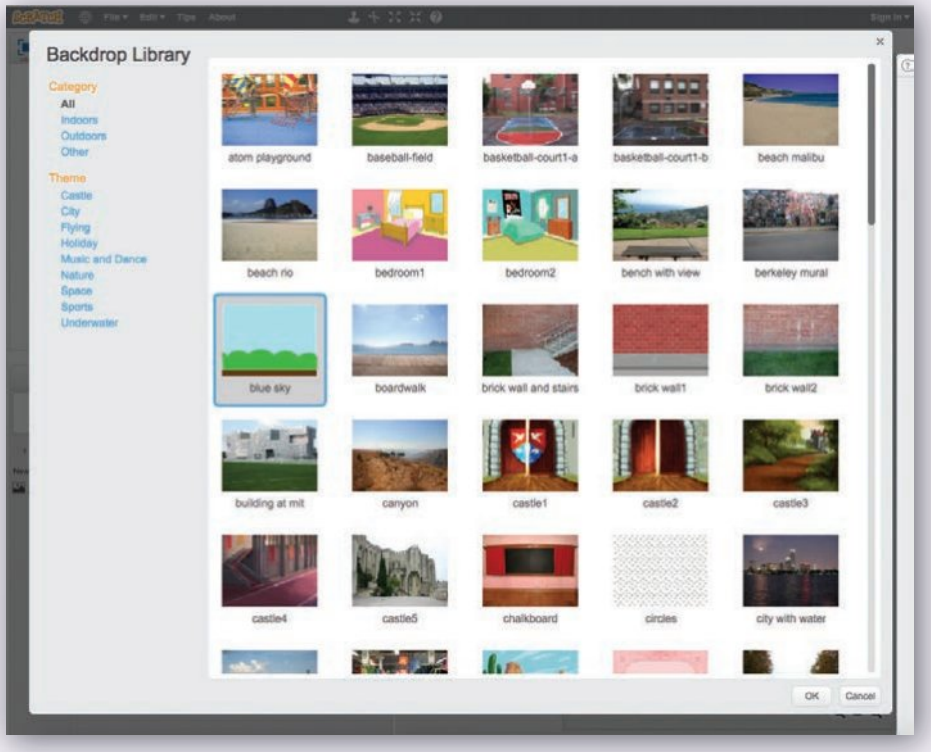
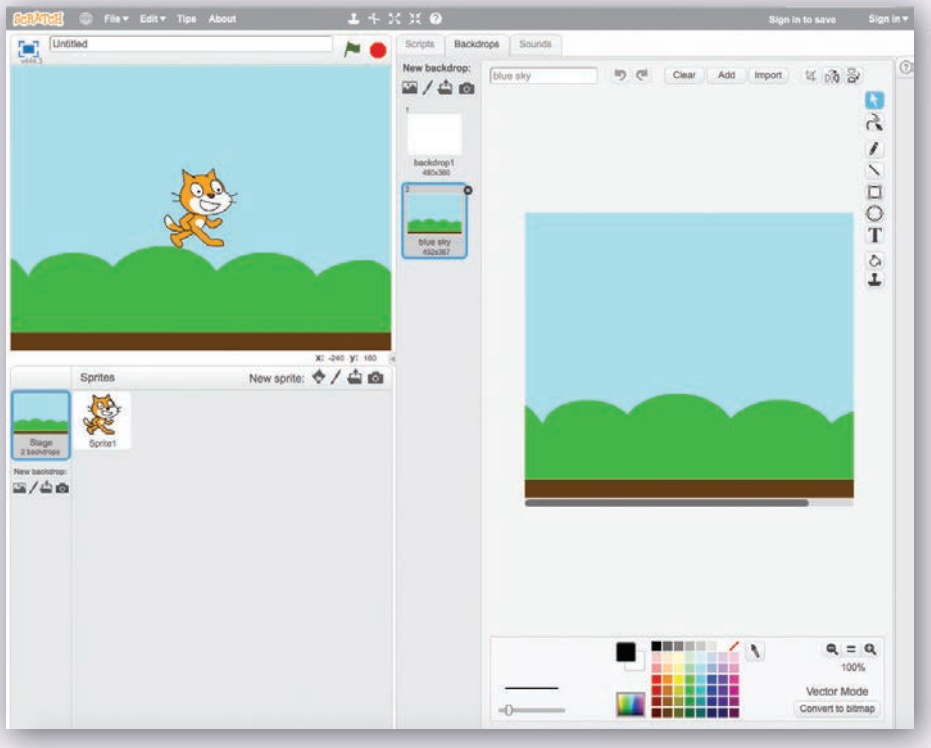
3 A range of options will appear. For this example, we have chosen the blue sky backdrop.



4 The Scratch Editor should now look like this. To zoom in on the STAGE, and check what the finished project will look like, click the view full screen button at any time.



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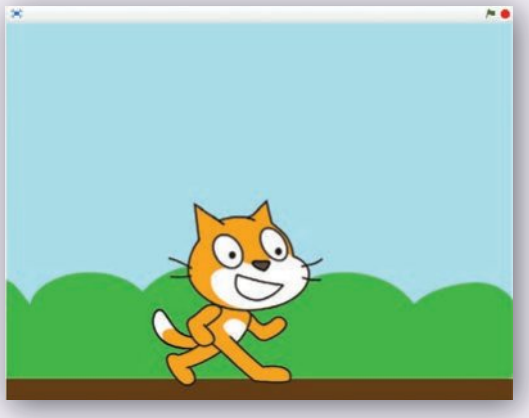
From here we can see our cat better.

5 Save your project.

6 Let's now try making our cat sprite larger. Hit the **GROW** button, then click on your cat as many times as you want until you are happy with the size of the cat. For this example we have clicked our sprite 15 times. If you click too many times, hit the **SHRINK** button.

7 Next, let's bring our cat back down to earth. In the Scratch Editor, click on your cat and drag it down to level with the ground.



Good job, you now have your sprite ready for action.

8 Save your project.

Next up, let's code our sprite to make the cat talk like a comic strip.

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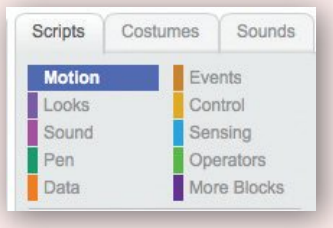
Algorithms and programming exercise 4

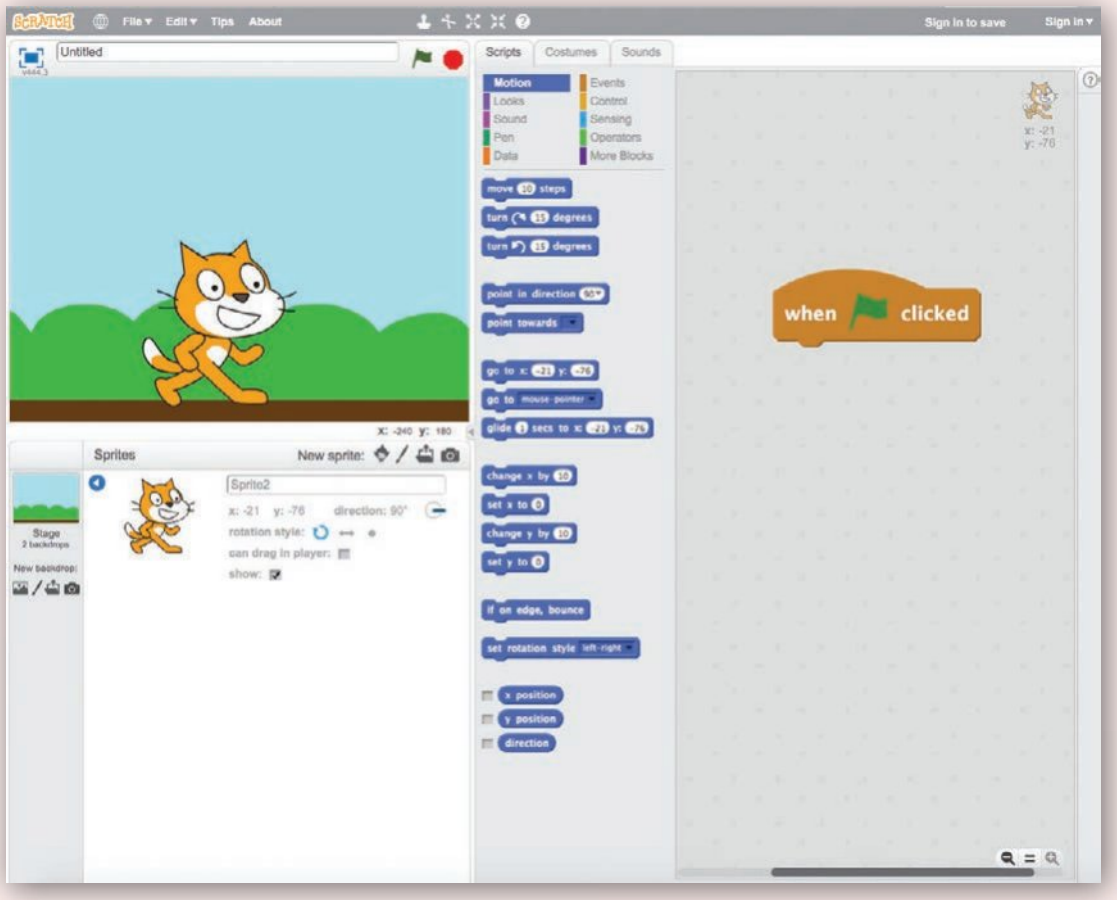
Using code blocks in Scratch

Skills practised
- Coding in Scratch using blocks
- Editing code blocks

1 Click the **SCRIPTS** tab. You will see a range of different options, which are colour coded. These are called blocks. Click the option on the left called **EVENTS**.



2 Click on your sprite, then drag the  code block over to the scripts area.



3 Next, because we want our animation to work in a continuous loop (in coding this is known as *iterative* – something that is recurring/repeating), from the **SCRIPTS** tab drag the code block called **FOREVER** over to the scripts area. Connect it to the bottom of the  block – you will see they connect like Lego bricks!

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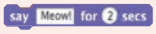
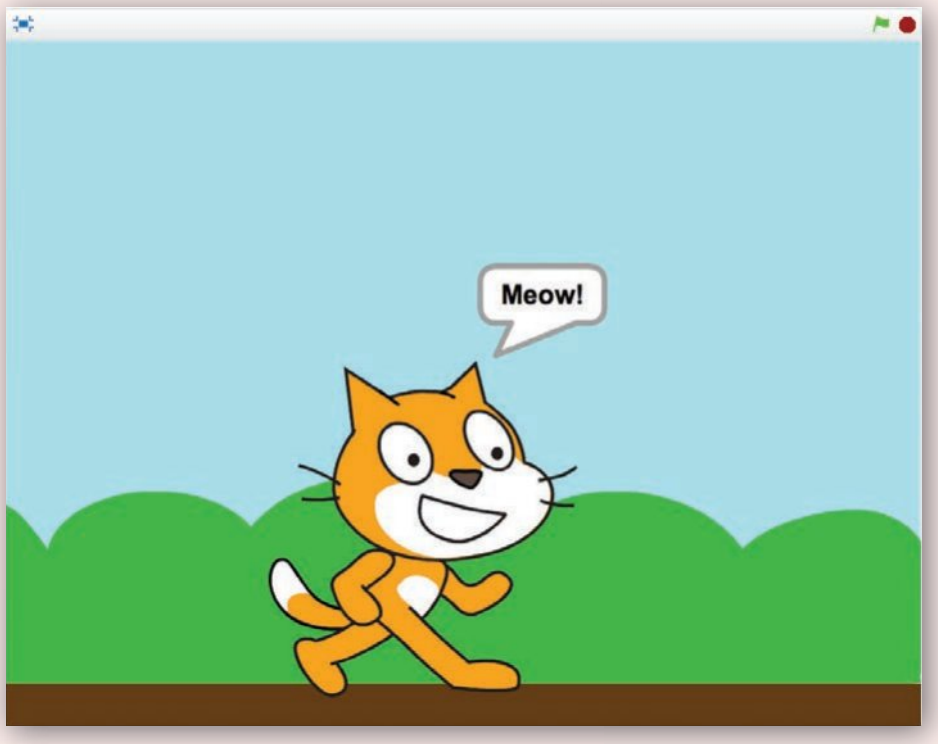
The scripts area should now look like this:

4 Next, drag across and join the following block to our code. 

5 Click on the textbox on the piece of code, and change the text to anything you like. For our cat, we are going to make him say Meow! 

6 Let's now check the progress of our animation. Click on the **GREEN FLAG TO START** button to see our sprite speak like a cartoon.



7 Save your project.

Next up, let's code our sprite to make the cat walk and make sounds!

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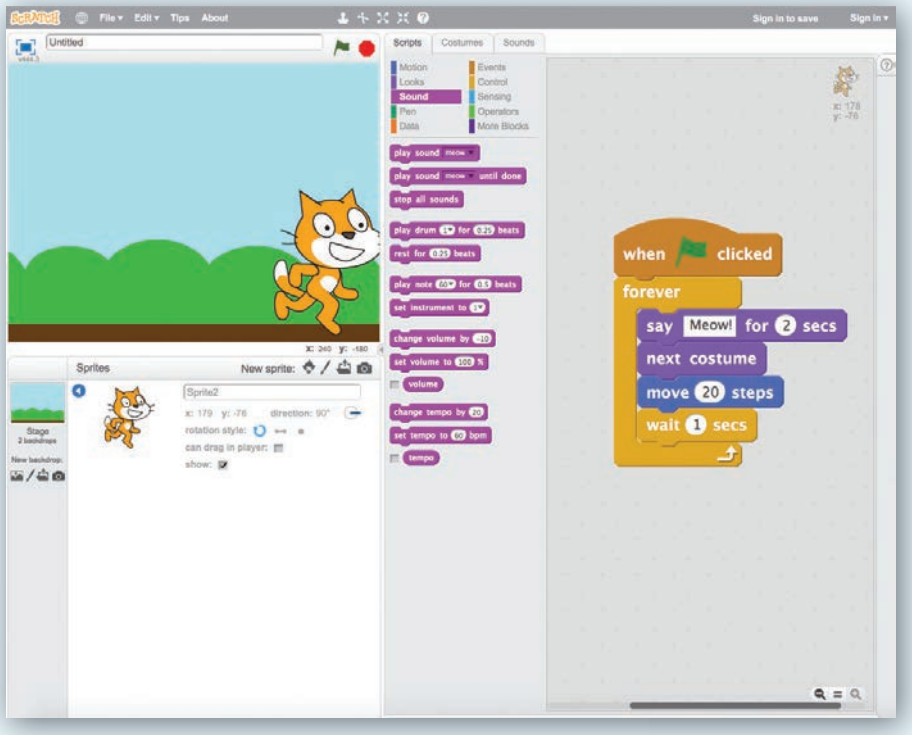
Algorithms and programming exercise 5

Animating in Scratch

Skills practised
- Adding movement
- Adding sound effects
- Adjusting sprite movement
- Editing sprite costumes

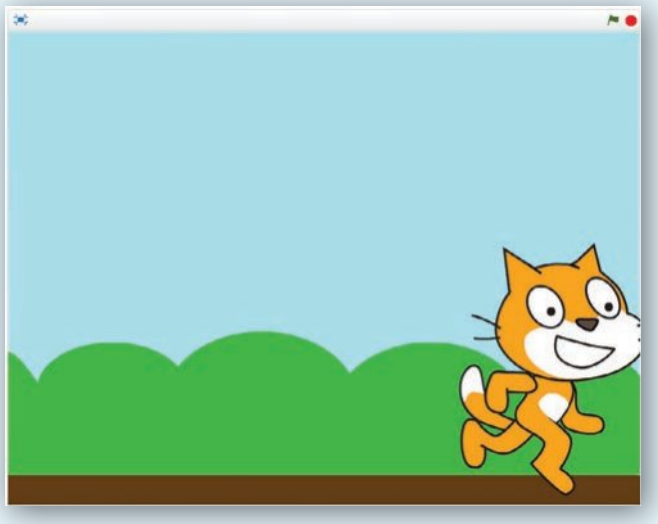
1 Next, add the following blocks of code to make the sprite walk. Then click on the **GREEN FLAG TO START** button.

Challenge question: Which block did we modify, and how?



Note: some sprites do not have moving legs, so won't 'walk' like this example. The moving leg effect comes from the different costumes available for the cat sprite.

2 One thing you may notice is that the sprite walks off the stage, like below.



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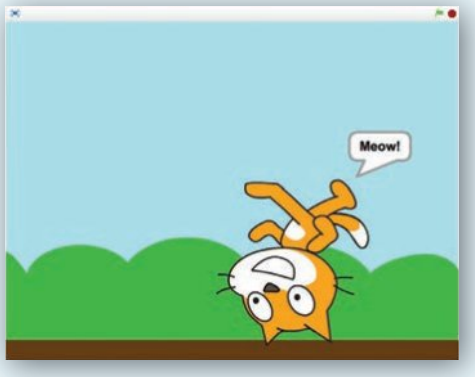
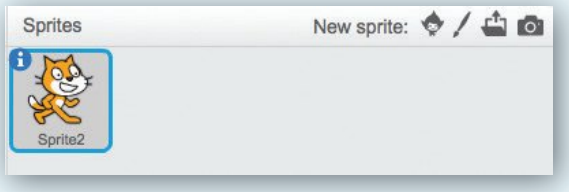
3 To fix this problem, as well as add a sound effect, add the following code blocks.

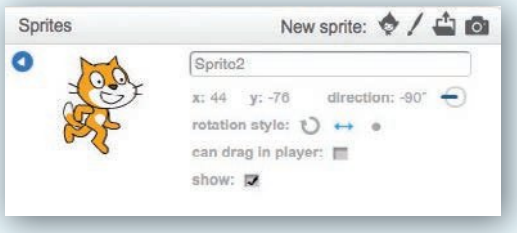
4 One problem you may find is that when your sprite reaches the edge of the stage, this happens:



5 To stop this from happening, in the sprite list section of the Scratch Editor, click on the information button on the sprite.



6 Next click the arrows in the rotation style menu.



7 Now the sprite stays upright and walks from one side of the stage to the other.

8 Finally, let's add one finishing touch to our animation. In the **COSTUMES** tab click on the second costume version of the sprite. This version shows the cat raising its legs, which combined with costume 1 gives the illusion of movement.

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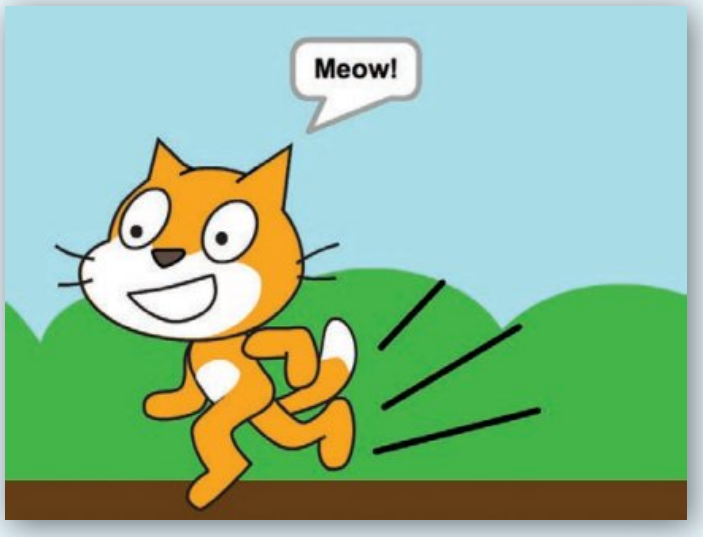
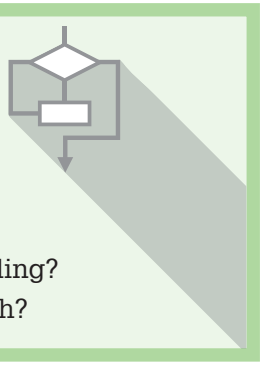
9 Using the **LINE** drawing button, draw some lines behind the feet of the cat.

Now when you animate your cat, it should look something like this:



10 Save your project, and share if you like.

Algorithms and programming exercise 6



Class discussion

As a class, discuss the following questions:

1 How is Scratch an example of how computer programs run using coding?

2 In what way does algorithmic thinking influence how you use Scratch?

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Algorithms and programming exercise 7

Scratch challenge 1: make a detailed animation

Skills practised
- Applying algorithmic thinking
- Expanding Scratch skills

1 Using your experience creating a simple animation in Scratch, now you can make a more detailed animation of your choice. However, ensure you include:

> rules in your coding for the ways sprites move (equivalent to conditional statements language used in algorithms – IF THEN ELSE)

> an action that occurs for 10 seconds instead of forever

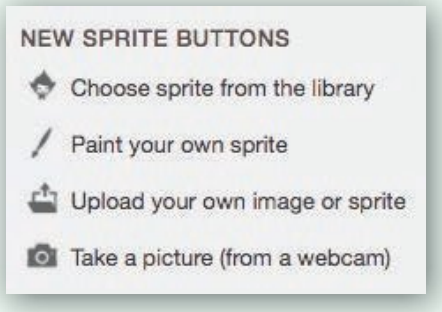
> at least two sprites (one totally new designed and 'painted' by you)

> a backdrop with modified colours (Tip: Try to make the sprites match your backdrop!)

> more detailed animation steps using duplicates of sprites with costume modification

> a range of sound effects

> an animated conversation between at least two characters.



2 If you need help with any step, refer to Scratch's own great step-by-step tutorials.

3 Share your animation with a partner, and evaluate each other's work. Did the coder behind the animation do anything unexpected? Is there anything you could learn from your partner that you could use in future Scratch projects?

A Please see the Interactive Textbook for Scratch challenge 2: making a game.

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ALGORITHMS AND PROGRAMMING PROJECT

Convert parking fee algorithm to digital solution

Using the steps outlined in 10.1 What are algorithms?, design a set of PowerPoint slides that include action buttons for the user to determine the parking fee (refer to Module 6: Multimedia presentations if unfamiliar with creating PowerPoint slides). The car parking fee algorithm described early in this module can be used to create a solution.

Collect data

Use the algorithm on page 201 to work out a structure for your slides.

Define the solution

Design a set of slides that will be used to display the choices to the user and resulting parking fees.

Implement the solution

Create the presentation.

Evaluate, collaborate and manage

1. Test your presentation. Does it work as you expected? Does it satisfy the problem? Does it work for various lengths of time parking? Is it easy to use? Does it make sense?
2. What do your classmates think of it?
3. Make modifications as necessary and test it again.

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Glossary

algorithm
Step-by-step procedures required to solve a problem. An algorithm may be described in many ways. Flowcharts are often useful in visualising an algorithm.

algorithmic logic
A logic behind breaking down computing problems and information systems into step-by-step processes in order to solve problems or achieve specified outcomes. It involves sequencing and abstraction and leads to algorithmic statements.

branching
Making a decision between one of two or more actions, depending on sets of conditions and the data provided.

coding
The process of writing computer software code.

components
Parts or elements that make up a system or whole object and perform specific functions.

data
May include characters (for example, alphabetic letters, numbers and symbols), images, sounds and/or instructions that can be manipulated, stored and communicated by digital systems.

database
A collection of data organised by records and fields that can be easily stored, accessed, managed and updated. Interaction with a database usually takes place through a user interface designed specifically for the structure and use of the data stored in it.

decompose
Separate a complex problem into parts to allow a problem to be more easily understood.

design thinking
Use of strategies for understanding design problems and opportunities, visualising and generating creative and innovative ideas, and analysing and evaluating those ideas that best meet the criteria for success and planning.

digital system
Digital hardware and software components (internal and external) used to transform data into a digital solution. When digital systems are connected, they form a network.

ethical
Moral principles – also known as right or wrong behaviour.

ethical protocols
Generally accepted rules or behaviours when undertaking research and collecting and using information from primary and secondary sources (e.g. confidentiality, informed consent, citation and integrity of data).

IF statement
A conditional decision statement used to control the flow of a program.

information system
A combination of digital hardware and software components (digital systems), data, processes and people that interact to create, control and communicate information.

peripheral device
A digital component that can be connected to a digital system but is not essential to the system (e.g. printer, scanner, digital camera).

plagiarism
A serious type of copying where someone claims that another's work is their own.

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structured English

The use of the English language to describe the steps of an algorithm in clear, unambiguous statements that can be read from start to finish.

user interface

Characteristics of the boundary between users and a computer system, or the manner in which users interact with computer hardware or software.

Voice over Internet Protocol (VoIP)

A technology that allows you to make voice calls using a broadband internet connection instead of a regular phone line.

wireless device

A device that transmits and receives data from other sources, using electromagnetic radiation (e.g. radio waves) rather than being connected by electrical conductors such as wires.

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