

Collins

Cambridge IGCSE™

ICT

STUDENT'S BOOK

Paul Clowrey

3 Storage devices and media

Why this unit matters

Every year we save more and more information on computer systems and the need for data storage capacity keeps increasing. Data files, records, pictures, music, films, games and applications all require storage space. A few years ago, we only kept a few files on our computers, but we are now using computers at home, work and school.

I use a high-resolution digital SLR camera for still images and a dedicated high definition video camera for video. Both of these devices capture imagery at very high resolution, providing lots of detail but creating very large computer files. I need high capacity memory cards and computer drives to store and access my work. (Professional digital photographer)



From high resolution X-rays to patient records and training documents, lots of information is now stored on computers, making information easier to access from anywhere in the hospital. This information must be electronically secure from unauthorized access and backed up. If any of the original computer information is lost, another copy must be made available quickly. (Hospital worker)

Customers are often unsure about how much storage they need and want advice on the best way to back up their files. The advice we give must be based on the needs of the user. For example, a young family with a computer full of photos, videos and games will need more storage capacity than an author writing a book using a word processor. (Computer store manager)



Your practical task

You work for a new international bank called Abacus. The business prides itself on using the latest technological advances and incorporating them into its high street branches all around the world. You are responsible for making sure that computer information is stored and backed up at each branch and for ensuring that all staff are kept up-to-date with the methods used. Banking information is highly confidential and the risks to security, should any data be lost, are taken very seriously. Employees must use storage and backup methods correctly, and training documents are regularly produced.

You have been asked to:

- produce a training document for staff involved with storing and backing up data; it explains the different devices, media and methods available
- create a simple spreadsheet and chart that compares the storage capacities of different devices
- create an additional leaflet explaining electronic banking methods to new employees.

What this unit covers

THEORY

Sessions

- 3.1 Storage devices and media
- 3.2 The importance of data backup
- 3.3 Banking facilities today

Theory review

PRACTICAL

Sessions

- 3.4 Document preparation
- 3.5 Adding text and images to a document
- 3.6 Creating a simple data model and chart
- 3.7 Final document checks and presentation

Practical review

By the end of this unit you will be able to:

- describe a variety of storage devices and media, together with common uses for each
- explain the advantages and disadvantages of different methods in terms of speed, access, use and cost
- understand the importance of regularly backing up data
- describe the various electronic methods and communication systems used in banking today.

In your practical work, you will develop and apply skills in:

- communicating using document production skills
- document creation; combining text, images and graphical elements in your work
- creating and using a simple spreadsheet model
- saving, checking and printing your work
- using file compression to assist with storage and electronic transmission.

SESSION 3.1 Storage devices and media

Background

In this session, you will look at the many different storage devices and media used today, as well as their uses, capacities and differences.

The difference between storage devices and media

A storage device is something that has the ability to read and write information to and from storage media, for example, a CD/DVD writer or tape drive. The components that store the information, such as CD/DVDs, hard disks and memory cards, are storage media.

Storage technology




The technology used in modern storage devices and media comes in three varieties, each with its own characteristics.







- **Magnetic:** stores data in tiny magnetic dots on a disk or tape, organised to store binary data.
- **Optical:** uses a laser to read, and write, a binary dot pattern on a spinning disc.
- **Solid State:** uses non-volatile memory chips to store data electronically with no moving parts.




Activity 1

Write a list of all the things at home – not just computers – that you think can store electronic information. Compare and discuss your answers with a friend.

Storage devices and media: their advantages and disadvantages

Description	Advantages	Disadvantages
 <p>Fixed magnetic hard disks: found in most computers as the main storage device. Use complex magnetic components. Storage device using direct access</p>	<ul style="list-style-type: none">● Their capacity is constantly increasing as prices are decreasing.● Fast access; data can be read from any part of the disk (this is known as random access).	<ul style="list-style-type: none">● Due to their mechanical complexity, physical errors are extremely difficult to fix.● Limited life span; data should be transferred every few years.● Slightly slower to access than internal memory.
 <p>Portable magnetic hard disk drives: a portable version of the hard disk. Ideal for transferring data from one computer to another and also used to increase a system's storage capacity. Also known as a removable hard disk drive. Storage device using direct access</p>	<ul style="list-style-type: none">● They can often be powered using the connecting USB cable.● Portable hard disk drives add extra storage capacity to a computer without having to open the computer casing.	<ul style="list-style-type: none">● Similar to a larger hard disk; difficult to repair and a limited life span.● Slightly slower to access than internal memory.● Capacity is not as large as a standard hard disk.
 <p>Magnetic tapes: used most commonly for large scale data storage and backup. Storage media using serial or sequential access</p>	<ul style="list-style-type: none">● A low cost way of storing hundreds of gigabytes of data.● Information can be set to back up overnight or outside of office hours.● Tapes are portable and can be stored safely.	<ul style="list-style-type: none">● A special drive is required to read and write data to them.● Access is much slower than a normal hard drive. (Serial access, see page 112)● Not really practical for day-to-day storage and retrieval.

Description	Advantages	Disadvantages
 <p>Optical CD/DVD: optical disk, normally used in retail for music releases and films to be played on home entertainment systems.</p> <p>Storage media using direct access</p>	<ul style="list-style-type: none"> • Low cost due to mass production. • A world-wide standard; both CD and DVD players are widely available. • No moving parts and require no power supply. • Long lifespan if stored carefully. 	<ul style="list-style-type: none"> • Scratches can make them unreadable. • Information is read-only.
 <p>CD/DVD-ROM: optical disk, used to store commercial computer software such as an encyclopaedia, game or installation disk.</p> <p>Storage media using direct access</p>	<ul style="list-style-type: none"> • Similar to that of CD/DVD disks. • Large software packages can be easily distributed. 	<ul style="list-style-type: none"> • Similar to that of CD/DVD disks. • If damaged, software must usually be purchased again.
 <p>CD/DVD-R (Media): optical disk that can be written with data or media files once only. Used for backups and writing music CDs.</p> <p>Storage media using direct access</p>	<ul style="list-style-type: none"> • Low cost due to mass production. • Most computers have the ability to read and write disks. • A long lifespan; some manufacturers claiming at least 50 years. • Disks can be left open and added to until they are full. 	<ul style="list-style-type: none"> • Similar to that of CD/DVD disks. • Errors can occur during writing, making the disk unusable. • Data cannot be erased.
 <p>CD/DVD-RW: optical disk that can be written with computer or media files, erased and used again.</p> <p>Storage media using direct access</p>	<ul style="list-style-type: none"> • Similar to that of CD/DVD-R disks. • Each part of the disk can be erased and rewritten hundreds of times. 	<ul style="list-style-type: none"> • Lifespan is thought not to be as long as other optical disks. • Disks may stop working due to repetitive erasing and rewriting. • Not all disk players can play rewritable disks.
 <p>DVD-RAM: similar to a DVD-R but designed to be more robust, with quicker access.</p> <p>Storage media using direct access</p>	<ul style="list-style-type: none"> • Rewritable and protected from damage in a plastic case. • Designed and manufactured to a higher standard than standard CD/DVD-RW to last longer. 	<ul style="list-style-type: none"> • More expensive than standard optical disks. • Less compatible with household players. • Slower to write than standard writable disks.
 <p>Blu-ray: a high-capacity optical disk used for high-definition films and modern computer and console games, and data backup.</p> <p>Storage media using direct access</p>	<ul style="list-style-type: none"> • Able to store full-length high-definition films and modern computer and console games. • Up to 10 times the capacity of DVD disks. • Disks very difficult to copy, preventing piracy. 	<ul style="list-style-type: none"> • Writable Blu-ray disks are expensive and require a Blu-ray compatible drive. • Commercial usage limited to entertainment media. • Blu-ray content more expensive than standard DVDs. • Already being replaced by Ultra HD Blu-ray.

Description	Advantages	Disadvantages
 <p>Solid state memory: uses microchips to store information with no moving parts; found in portable drives and memory cards. Storage media using direct access</p>	<ul style="list-style-type: none"> ● Less susceptible to shock and damage. ● Silent. ● Faster read and write times than standard hard disks. ● Used as a high-speed replacement for magnetic storage. ● Ideal for portable devices. 	<ul style="list-style-type: none"> ● Practically impossible to repair if damaged. ● Lower storage capabilities than hard disks. ● Price per gigabyte of storage is higher than hard disks. ● Vulnerable to electrical or magnetic interference.
 <p>Pen drives: extremely portable solid state memory storage devices; designed to plug into the widely used USB port. Storage media using direct access</p>	<ul style="list-style-type: none"> ● Ideal for pocket and key-ring size devices. ● USB sockets are found on the majority of computers. ● Require no additional power. 	<ul style="list-style-type: none"> ● Similar to that of all solid state drives. ● Can be easily misplaced or lost.
 <p>Flash memory cards: used to expand storage in smart devices, games consoles and digital still/video cameras. Storage media using direct access</p>	<ul style="list-style-type: none"> ● Thumbnail-sized cards becoming common place. ● Cost-effective way of adding additional storage to devices with limited storage. ● Common standards include SD, MicroSD, xD and CFast. 	<ul style="list-style-type: none"> ● Smaller micro-style cards are easy to lose. ● Many different models, each with slightly different connectors.

Describing storage devices and media

Different devices access and use memory in different ways. The following terms may be referred to when describing storage devices and media.

Main or internal memory: Memory used by a computer system when processing or storing information. Random Access Memory (RAM) can be read and written to while using programs; the more RAM a system has, the faster it will run. Read Only Memory (ROM) holds permanent data that cannot be changed; it is normally used to store the essential program drivers (or firmware) needed to start your computer.

Backing storage: Any type of data storage device apart from RAM or ROM. This includes the hard disk drive found inside most PCs and normally used to store data permanently, even when the computer is turned off.

Serial or sequential access: Data is stored in a sequential sequence so that information stored can only be accessed by scanning through the data to that point. Tapes are an example of this type of storage.

Direct/random access: Any piece of information stored on a random access device can be accessed without having to scan through its whole contents. This is much faster than serial access.

Connectivity: Many computers may use an internal drive to read storage media, but external devices can also be connected by USB, USB-C, FireWire, Ethernet cables or by using Wi-Fi networking.

Access speeds: This is how quickly a user can access the information on any storage device. Access speeds are measured in 'bytes per second' (Bps) with slower devices measured in thousands (KBps) and faster devices using millions (MBps). A user's choice of device may depend on how quickly they need to access data. Individual device speeds vary but generally speaking the following is true:

- **Magnetic tape drives:** Slow to access as the drive has to fast-forward or rewind to the required section.
- **Optical storage:** A modern compact disk will have an access speed of about 8 MBps, DVD about 20 MBps and Blu-ray disks 18 MBps.

Real world

The lifespan of any new technology is notoriously difficult to predict, as long-term tests are rarely done before it is put on sale. If a device has only been around for a few years, it is not certain how long it will work or keep the information that it stores. One thing that is agreed upon is that no one method should be relied upon as a permanent solution. A DVD-R can hold seven times the amount of data as a CD-R, and Blu-ray disks can store 10 times that of a DVD. Who knows what the next development will be?

- **Magnetic hard disk storage:** Modern drives can have access speeds of around 200 MBps.
- **Solid state based storage:** As there are no moving parts and flash based memory is much quicker to read and write, access speeds of over 500 MBps are possible.

Storage capacity

The table below provides some typical capacities, but it should be noted that hard disks and solid state drives are constantly increasing in storage capacity.

Storage device or media	Typical capacities (at the time of publication)
CD*	700 megabytes (MB)
DVD*	4.7 or 8.54 gigabytes (GB) (single or dual layer)
DVD RAM*	4.7 or 9.4 GB (single or dual layer)
Blu-ray*	25 or 50 GB (single or dual layer)
Pen drive**	2–64 GB
Flash memory cards**	2–64 GB
Portable disk drive**	320 GB–4TB
Solid state drive**	500 GB–2 TB
Magnetic disk drive**	1–8 TB
Magnetic tape**	500 GB to 5 TB

* Generally fixed manufacturing standards

** These capacities are constantly being increased as manufacturing techniques develop.

Real world

Every year we increase the amount of data we store; documents, photos, videos, games and music. This means file compression, using ZIP and RAR utilities is increasingly useful for storing and archiving files or reducing file sizes when emailing.

Language

Pen drives are sometimes referred to as **USB** or memory sticks.

File sizes

When matching usage to storage devices, it is important to consider approximate sizes for different types of files.

8 bits	1 byte	Word processed document	100 KB
1024 bytes	1 kilobyte (KB)	eBook	500 KB
1024 kilobytes	1 megabyte (MB)	Mp3 track	5 MB
1024 megabytes	1 gigabyte (GB)	Digital photo	3 MB
1024 gigabytes	1 terabyte (TB)	Film	1.2 GB

Real world

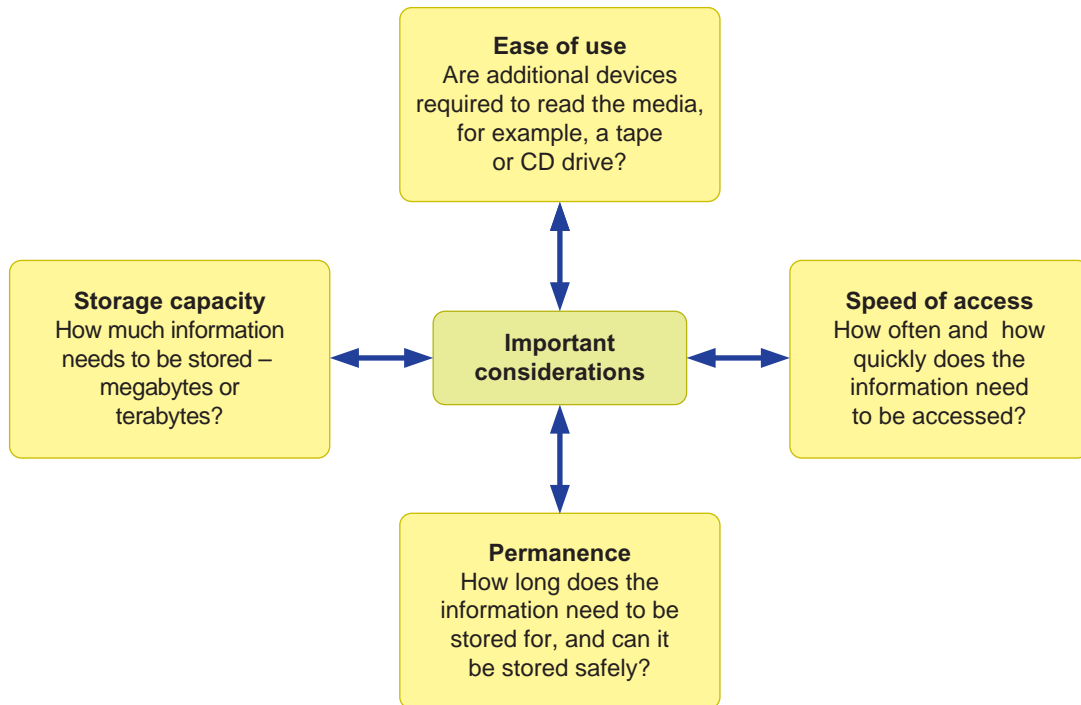
There are many types of memory cards available today, and different manufacturers often create their own for a specific type of device. Look at the devices that you and your friends own, from cameras to mobile phones and portable gaming machines – how many different types of memory card do you use?

Activity 2

- 1 Create a short survey and ask classmates or friends to estimate how many of each of the following types of files they own electronically:
music tracks, **eBooks**, films, digital photos, office documents.
- 2 Combine your survey results with the approximate sizes above to estimate how much information the people you surveyed own. Which devices would be the most appropriate to store the data they own?

Evaluating storage devices

It is important to choose the best device, based on the users' needs and considering the characteristics, advantages and disadvantages of each. The diagram below illustrates the main considerations when choosing a suitable storage device.



Activity 3

Using the storage considerations diagram as a guide, discuss in small groups the following situations, and decide on the best storage options.

- 1 Taking a report home to work on.
- 2 In an architect's office, using **CAD** to create building plans and graphics software to see what new buildings might look like.
- 3 In a music recording studio, using computers to record and then edit multiple audio tracks, from singers to instruments and percussion.

Review and revise

You should now be able to:

- describe the most common forms of storage devices and related media
- identify common uses for storage devices, including types of access and access speeds
- consider the different capacities available and define the difference between main/internal memory and storage
- explain the advantages and disadvantages of different methods in terms of speed, access, use and cost.

SESSION 3.2 The importance of data backup

Background

The phrase 'backing up' essentially means making an extra copy of computer information so that, in the event of a problem, loss of the original file, or damage to the computer, the backup copy can be used as a replacement. This session will look at the importance of backing up data and the various methods available.

What should be backed up?

In an ideal world, if the cost of storage space was no object, every system would be backed up. A backup copy of your home computer would include the **operating system**, program files, personal documents, device drivers and everything else on your computer. Unfortunately this is not always possible, so a choice has to be made about what to back up. Operating systems can be re-installed from disks and programs can be downloaded again, but photographs of your holiday or that last school report you wrote could not be replaced without being re-created.

This is even more important for organisations. Hospitals and banks, for example, store important, private information – and if that information became lost or **corrupted**, then lives and businesses could be at risk.



Activity 1

Think about the main computer in your home, or in a family member's home. What kind of important information is stored on it? Create a list of what you come up with and then, in a small group, discuss what might happen if that information were suddenly lost.

Activity 2

Create a table with the following headings:

- School
- A graphic designer
- Designing the pages of a popular newspaper
- Hospital

For each heading, write a list of all the information you think would be important to back up, and describe what would happen if it were lost.

Backup models

The following are popular methods for backing up information.

- Manually choosing a selection of files to be saved onto a disk. This is useful for backing up a small selection of essential files. It is known as 'an unstructured backup'.
- Creating a copy of every file, both personal documents and system files, stored on a computer hard drive in case of a serious failure. This is often called creating an 'image' of a computer. There are software tools that can do this, but it does take time, which means it isn't suitable for regular use. This is referred to as 'a full system backup'.
- After a full system backup, backups are made at regular intervals of whatever has changed since the initial and following backups. This means that only small amounts of information are regularly saved, and users can look back at a system at a specified date in the past. This is known as 'an incremental backup'.
- If a fire burns down an office of computers and the backup drive is permanently plugged in, then it, too, will be lost. Using an off-site backup minimises the risk of losing data by making sure the drive or disks used are kept elsewhere, ideally in a secure location. This is called 'an off-site backup'.

Real world

There are manufacturers that claim to have created indestructible storage devices that can withstand fire, water, pressure and physical damage. These usually work by encasing the storage medium in a protective box.

Real world

Security concerns about the information we store has increased in recent years, especially as more and more personal data is being stored using **cloud computing** and therefore accessible via the internet. Data **encryption** scrambles computer files so that they can only be read with the correct encryption key.

Backup solutions

Depending on the needs of the user, there are a number of solutions available, ranging from practical to commercial options.

- **Manually copying files.** This is often the simplest solution and involves plugging in a USB hard disk and copying files to it on a regular basis.
- **Software backup.** There are numerous software solutions that will copy selected files to a backup drive at a selected time. This prevents people from forgetting to backup and can be set to happen when the computer is not used – late at night, for example.
- **Mirroring (often referred to as RAID).** Two or more compatible hard disks are linked in such a way that information is written to them both at the same time, creating clones of each other. If one drive fails, the other is still accessible.
- **Online or remote backup.** Rather than backing up files to a physical device, files are backed up via the internet to an online server. This is usually done via **third party software** installed on a computer. There are many businesses that offer this service, and price is based on the amount of storage required and the number of access features. Storing files online is a key element of **cloud computing**.

Language

Cloud computing is the term for accessing computer files, documents and programs remotely, either via a network or more commonly via the internet. This takes away the need for local storage devices and information can be accessed almost anywhere.

Activity 3

Research and discuss with your class the backup facilities built into Windows, Apple and **Linux** operating systems and compare the features they offer to third party solutions.

Review and revise

You should now be able to:

- understand the importance of regularly backing up data
- explain a variety of methods for carrying out backups.

SESSION 3.3 Banking facilities today

Background

Modern banking terminology

- **Electronic funds transfer (EFT).** This is used for paying by Chip and PIN or contactless payment (see Session 2.2) in shops and transferring money from one bank account to another, anywhere in the world. It may be a regular bill payment or payroll deposits. These can either be set up in person or electronically.
- **Automated teller machine (ATM).** Normally installed in public places, these installations have a direct communications link to a bank. They can release money and debit it from an account and can also manage some basic banking facilities. These include checking the balance or printing a mini-statement, paying bills or making money transfers. It is also possible to make cash and cheque deposits, usually by placing it in a specially provided envelope and sliding it into the ATM.
- **Credit and debit cards.** Used as an alternative to cash, this allows stores and organisations to debit money from an account for goods or services. Customers have a card and a PIN number. When the card is scanned and the PIN number entered correctly, it allows the store to contact the customer's bank. If the customer has sufficient funds, then the amount is deducted from their account and credited to the store. Information about magnetic stripe, Chip and PIN devices and contactless payments can be found in Session 2.2.
- **Cheques.** Rather than using cash, a cheque allows money to be withdrawn from one account and deposited in another. It contains the name and account details of the sender and the full name of the recipient. Being a paper-based system, it is often claimed to be the slowest way to transfer money as it needs to be checked and 'cleared' before money is transferred.



Real world

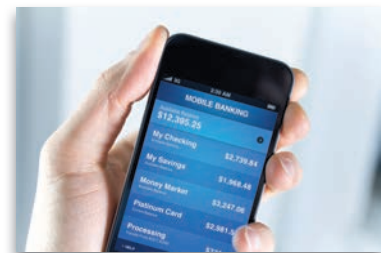
Many businesses are now introducing contactless payment systems that allow an individual to wave a debit/credit card or smart device over the reader that then automatically debits the users account. These are generally targeted at small value payments that would benefit from faster transactions such as queuing and paying for a coffee or snack. These systems use radio-frequency identification (RFID).



Modern communication methods and banking

It is becoming less and less essential to actually visit bank branches. Checking and changing balances, paying bills or applying for new accounts can all be done from home or from the office.

- **Telephone banking.** Done via either a conversation with a banking **call centre** or an automated system that responds using **voice recognition software** or telephone keypad choices.
- **Internet banking.** Account details are accessed through a **secure webpage** that provides direct access to a full range of account functions from setting up transfers to paying bills to applying for new products, overdrafts and updating personal details. Secure login and password details must be setup before use.
- **Mobile phone access.** Applications (or **apps**) are increasingly being produced that give direct access to a particular bank and account details, providing almost instant access to information wherever you are, without the need for a computer and browser.



Activity 1

Consider the following situations and describe the banking facilities that would be the most appropriate and why the different people might use them.

- 1 A university student living away from home.
- 2 An electronics store selling computers and mobile phones.
- 3 A retired couple who have moved to a remote rural house.

Advantages and disadvantages of modern electronic banking methods

Advantages	Disadvantages
<ul style="list-style-type: none"> ● Instant access without having to visit a branch in person. ● Money can be transferred instantaneously to anywhere in the world. ● Customers do not have to wait for monthly postal statements to check their balance and recent transactions. ● Banks can spot fraud activity more quickly by analysing patterns in your spending and online transactions. ● Additional functionality can be accessed online such as controlling overdraft levels, changing Chip and PIN codes or pay bills directly. ● Customers with limited mobility can access full services remotely. 	<ul style="list-style-type: none"> ● Identity theft is a real concern as banks rarely see customers in person. ● Mobile phone access requires a reliable data connection. ● Users are constantly sent spam emails, asking them to confirm, and therefore, give away login details. This is called phishing. ● Those without internet access often miss out on the latest deals and interest rates. ● Transactions using physical currency such as cash and cheques cannot be made. ● An internet-based bank could potentially be closed at any time due to technical problems.

Activity 2

What do you think are the biggest security problems associated with the systems outlined in this session? Discuss your thoughts with your classmates.

Activity 3

Considering the storage devices and media described in the previous sessions, list the types of information that a bank would have to store on a daily basis. In small groups, discuss and decide on the most appropriate storage devices and media. Explain your choices.

Real world

Two-step verification is a system that requires two pieces of security data in order to access an online system, for example a password and an extra security code. This provides an extra level of protection should your password be lost or stolen and many **ecommerce** systems, including banks, require customers to use it.

Review and revise

You should now be able to:

- describe the various electronic methods and communication systems used in banking today
- explain the advantages and disadvantages of different methods in terms of use and purpose.

3 Theory review

What have you covered?

In these three theory sessions, you have:

- been introduced to the most common forms of storage devices and related media
- explored the most common uses for different storage devices and their capacities
- considered the most suitable application for different capacities of storage devices
- discovered the difference between main and internal memory and storage
- reviewed the advantages and disadvantages of different storage methods in terms of speed, access, use and cost
- come to understand the importance of backing up data regularly
- been introduced to a variety of methods for carrying out backups
- explored the various electronic methods and communication systems used in banking today
- reviewed the advantages and disadvantages of different methods in terms of use and purpose.

Some practice questions

1 Draw lines to connect the images on the left with the best example of its use on the right.



Fixed hard disk



Pen drive



Memory card



Magnetic tape

Storage device in a digital camera

Business wanting to take a weekly file backup

A student transferring a homework file to the school network

The main backing storage device in a desktop computer

See Session 3.1

2 For each of the devices below, indicate with a tick whether it is a magnetic, optical or solid state device.

	Magnetic	Optical	Solid state
Portable hard drive			
DVD			
RAM chip			
DVD RAM			
Tape			

See Session 3.1

3 Link the media type on the left with its most appropriate use on the right.

Hard disk drive
Magnetic tape
Flash memory
Pen drive
CD/DVD

Backup of files in a large commercial organisation
Storing images in a camera
Main storage in a desktop computer
Storage of film or music files
Temporary storage and transfer of files between computers

See Session 3.1

- 4 a A computer's internal memory consists of RAM and ROM. Each has different characteristics and uses. Fill in the missing words with either RAM or ROM:

_____ is non-volatile memory.

When we are using a computer, the program we are using and the data we type in will be held in _____.

The computer's basic input output system (BIOS) will be stored in _____.

When the computer is turned off the contents of _____ is lost.

- b In the mid-1980s, personal computers had their operating system stored on ROM, so that as soon as you switched the computer on it was ready for use. Why do you think that today's desktop computers do not have the latest operating systems on ROM, but instead have it on the computer's hard disk?

See Session 3.2

- 5 Sergeiy runs a small business selling eBooks. Every week he runs a backup program.

- a What is a backup?
- b There are different types of backups, which depend on what exactly will be backed up. Sergeiy had a complete backup taken when he started this routine. Now his program just takes a copy of recently changed files. Give one advantage to Sergeiy of running a backup like this.
- c Give *two* reasons why Sergeiy runs this program every week.

- d Sergeiy receives an email from a company that offers a remote, or online, backup facility. The email tells him that for a yearly fee the company would hold copies of his files on their remote server. Sergeiy is not sure whether this backup service would be of use to him and asks for your advice. State the main reason that Sergeiy might want to make use of this service.
- e State *one* reason that Sergeiy might choose not to use this service.
- f How might Sergeiy still have the benefit of this type of backup, but without using a company like the one that contacted him?

See Session 3.2

- 6 a Identify *three* ways that a person can check his or her bank account balance without having to go to the bank itself.
- b Many people are concerned about the increasing use of technology in personal banking. The biggest concerns are security of personal information and access to information. Describe *two* ways in which the bank makes sure that the personal details of customers are secure.
- c How does the bank make sure that only authorised people access customer details?

See Session 3.3

Progress check

Aiming for good progress

- You are able to identify the main types of storage devices.
- You can determine which type of storage device might be used for a given application.
- You can distinguish between the different types of internal memory.
- You can describe the different types of backup methods.

Aiming for excellent progress

- You can describe the main types of storage devices.
- You can justify the choice of a particular storage device for a given application.
- You can identify the uses of RAM and ROM.
- You can justify a choice of backup method, depending on the user's requirements.
- You appreciate the concerns of bank customers regarding security of, and access to, personal details, and understand how the banking system addresses these concerns.

SESSION 3.4 Document preparation

Background

Working for an international bank called Abacus, you have been asked to produce a training document using suitable word processing software. This will inform the staff who are involved in backing up and storing data all about storage devices and media.

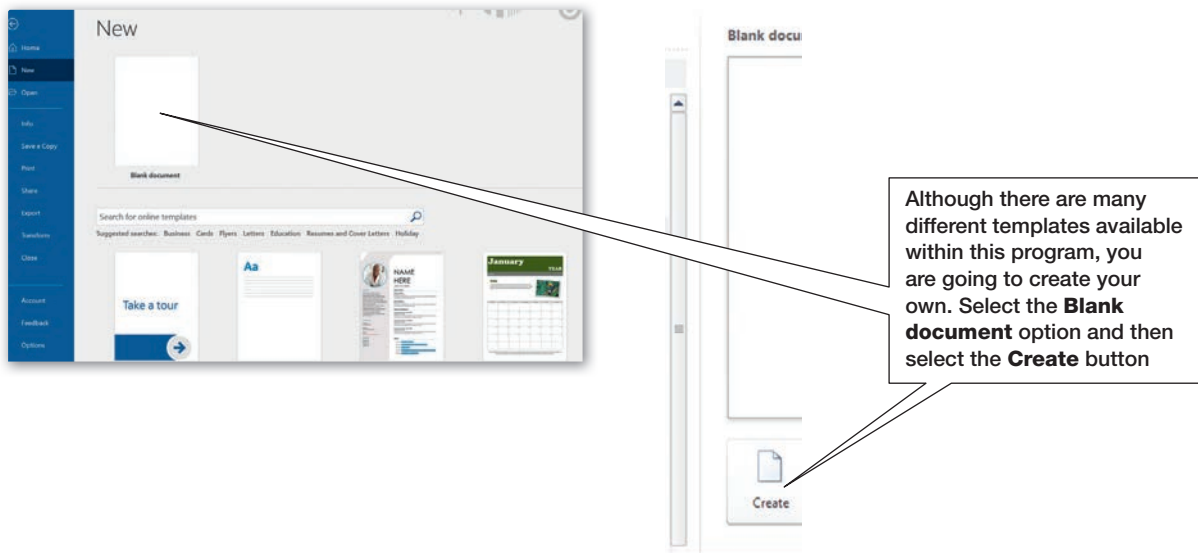
In this session, you will find out how to do the following:

- create a new document
- design a suitable page layout in keeping with the company house style
- save your work in a suitable format and location.

In the practical sessions throughout this unit you will reinforce and extend some document production skills.

Create a new document

In Session 1.7 you opened a document and imported data from existing files. In this unit you will create a new document. Shown below is a typical word processing package. Select **File > New** and you will get the following screen.

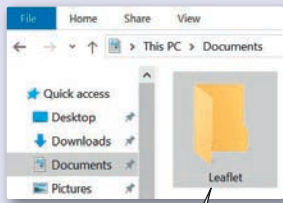


Saving and file location

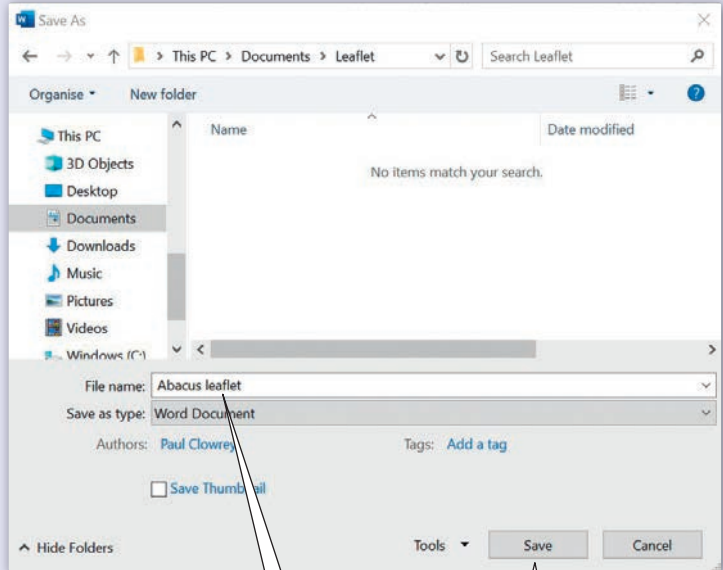
It is important that the file you have created has a suitable filename and location. This means that you can regularly save your work as you progress, and you will easily be able to find your work at a later date.

Activity 1

Set up a folder on your computer, and within it save a new blank document using suitable file and folder names.



Create a folder called LEAFLET within your work area. You will save all the files you create in this project inside this folder.



Using the filename **Abacus leaflet**, save your document into the folder you have just created. Select **Save**.

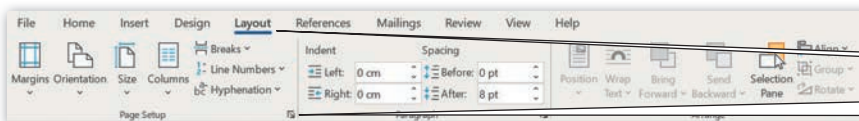
Designing a suitable page layout

Before adding information, it is important to set the page layout to suit the type of document you intend to produce. You will change the following properties of a document:

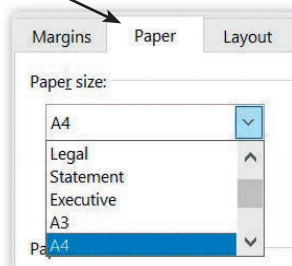
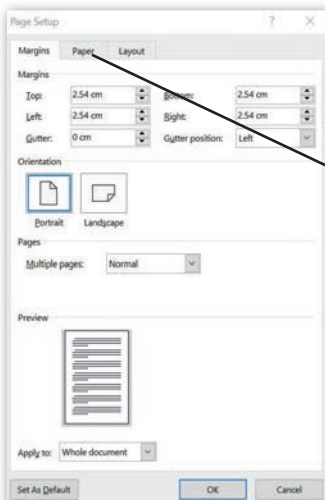
- page size, margins and orientation
- headers and footers
- columns.

Page size and orientation

You can change the page size and orientation as follows:



Select **Page Layout** then **Page Setup**. This will take you to the **Page Setup** window.



Then choose the **Paper** option to select the size of document you intend to create.

Activity 2

Using the Page Setup options, choose a suitable paper size for your document. This should be based on the size of paper and printer to which you have access.

Selecting the **Margins** option allows you to set the orientation of the document. The **Portrait** option will produce a tall, narrow document and the **Landscape** option will turn the page through 90 degrees to create a short, wider document.

The working area on any page is set using the **Margin** options. These settings adjust the space around the edge of every page in your documents.

Activity 3

Set suitable page orientation and margin settings for your document, bearing in mind the type of document you are creating and your printing facilities.

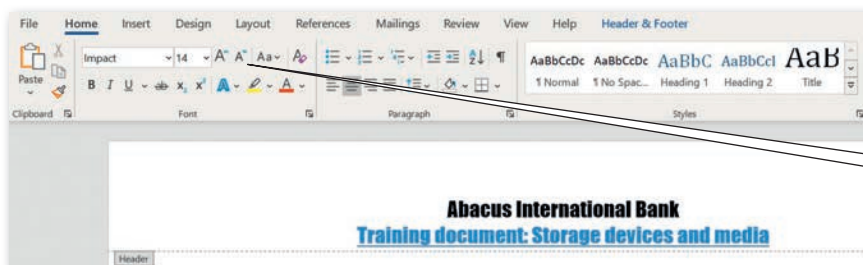
Headers and footers

Information added to the header (top) and footer (bottom) of any document will appear on every page of the document. They can be used to style a document and include the following types of information:

- titles, text and images
- page numbering
- file information
- current or document creation date.

Double clicking at the top of the page will open the header area. This is where a suitable document title can be added and formatted.

Alternatively select **Insert** from the ribbon and **Header** or **Footer**.

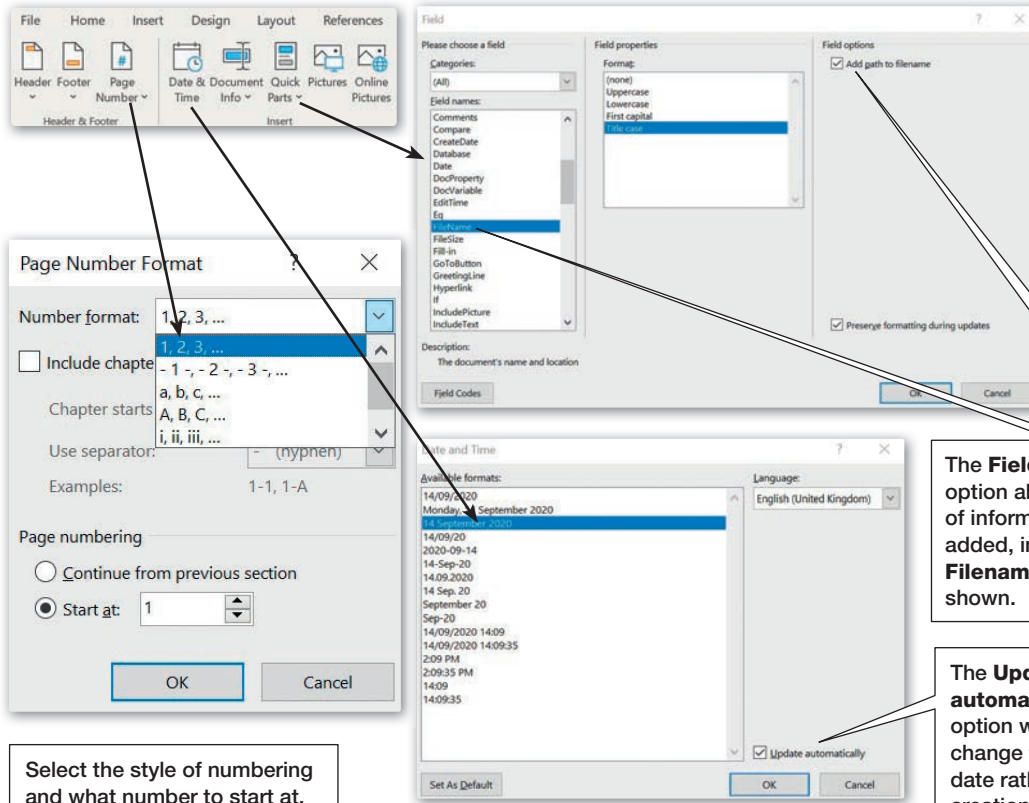


Standard formatting tools can be used to change the font, alignment and style.

Activity 4

Add a suitable title to your document using the header options and format it in the style of a modern banking business.

As headers are normally used for adding titles, additional information can be added to the footer as shown below.

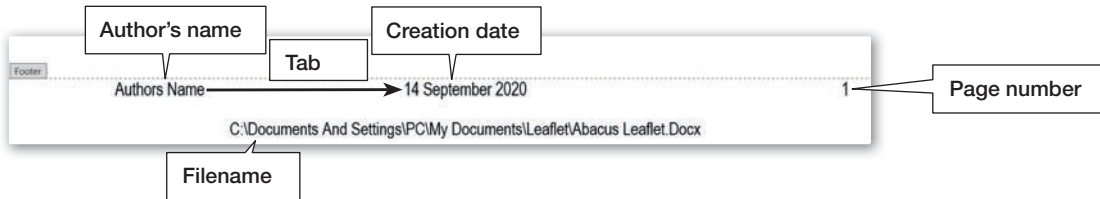


Select the style of numbering and what number to start at.

The **Field** option allows a variety of information to be added, including the **Filename and Path** shown.

The **Update** automatically option will constantly change to the current date rather than the creation date.

Text can be formatted using the formatting toolbar or by right clicking the text. The different fields can be spaced as shown by clicking the Tab button on your keyboard.



Activity 5

Using the Footer options shown, add the following to your document and style them accordingly: your name; the date; automatic page numbering; the filename and path.

Using columns

Columns, as you learnt in Session 1.8, are used to vertically divide a page before adding text, graphics and images. This is how newspapers and magazines are normally laid out.

Select **Columns** from the **Page Layout** menu and choose the number required. To make more choices, select **More Columns** from the **Columns** button. Here the width of each column and the space between them can be adjusted.

The space between the columns is also referred to as the **Gutter** spacing in some software.

Activity 6

Add a suitable number of columns to your document, making sure you add sensible width and spacing values. Save your document.

Review and revise

You should now be able to:

- create a new document and save it with a suitable filename in a suitable location
- set the page size, margins and orientation of a document
- use the header and footer option to add useful information
- divide a document layout into columns.

SESSION 3.5 Adding text and images to a document

Background

In this session you will build upon and discover the following skills:

- accurately adding and formatting text
- using tables
- inserting images into a document.

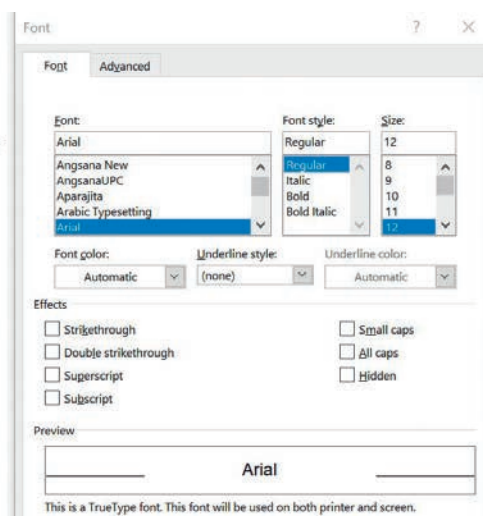
Adding and formatting text

Typing text straight into a word processed document is the simplest way to add information, and there are a variety of formatting tools to help you to present it in the most suitable way.

Text formatting

Below are a selection of fonts, styles and sizes.

Arial Size 12
Arial Size 10 in Bold
Times New Roman Size 14 Italic
Arial Black Underlined
~~Century Gothic Strikethrough Size 10~~
Impact Size 14 Highlighted



Tip

A standard selection of fonts is installed on every computer but new ones can be installed and different computers may not have the same fonts. This should be considered when transferring work from one machine to another.

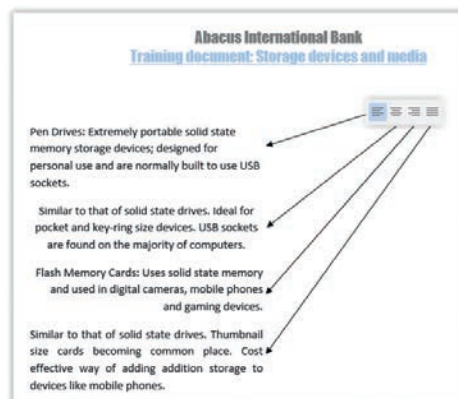
Language

Serif and sans-serif fonts. When describing fonts, a serif typeface has detailing at the ends of strokes in letters, while sans-serif fonts do not. Serif fonts are normally thought of as being traditional styles, such as Times New Roman, while sans-serif fonts like Arial are considered more modern.

The **Font** window shown above can be found on the main menu or **Formatting toolbar**. The font, style and size of any selected font can be changed to suit the requirements of the document. **Bold** or underlined headings, for example, are a good way of highlighting important information. Additional font effects include superscript, adding very small letters above the line of text and subscript, small letters just below.

Text alignment

The text on the right has been added to a document with two columns. The four paragraphs are aligned to the left margin, the right margin, centrally and fully justified (which means the text is spaced to meet both the left and right edges of the text area).

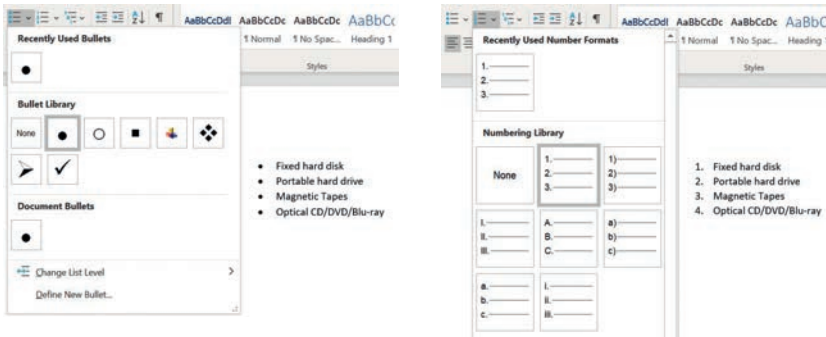


Activity 1

Create a new word processing document and type the name of the organisation in this unit – Abacus International Bank – six times on the page. Using different fonts and styles, create what you think are three modern headings and three more traditional ones. Share your ideas with a partner and discuss which would be most suitable for this type of business.

Bulleted and numbered lists

Bullet points or numbered lists are useful for displaying different points of information. They can be accessed from the main menu or by right clicking within a text area. Right clicking a bullet point or number will allow you to format it using the options shown.



Paragraph formatting

The space before and after paragraphs, line spacing, and tab settings can be edited to suit the style of document. The **Paragraph** dialogue box and settings can be found by selecting **Layout** from the ribbon bar.

The **Tab** settings can be changed allowing you to set how far the cursor moves when pressing the Tab key.

Additional positions can be added here.

Tabs

Tab stop position: [] Default tab stops: 1.27 cm

Tab stops to be cleared: []

Alignment: Left Center Right Decimal Bar

Leader: 1 None 2 3 ----- 4 _____

Set Clear Clear All OK Cancel

Tip

Setting the Tabs of a page allows text to be formatted neatly try to avoid lining up text by pressing the space bar.

Paragraph

Indents and Spacing Line and Page Breaks

General Alignment: Left Outline level: Body Text Collapsed by default:

Indentation Left: 0 cm Right: 0 cm Special: None by: []

Spacing Before: 0 pt After: 10 pt Line spacing: Single Multiple At least Double Exactly Multiple

Preview []

Tab... Set As Default OK Cancel

Indentation options allow the paragraph to be moved away from either the left or right hand margin. A hanging paragraph sets the first line to the left margin and the rest of the paragraph is indented.

The spacing options allow text to be spaced vertically. The basic setting for line spacing is **Single**. These settings also allow the space before and after paragraphs to be specified.

The following window outlines the options that are open to you when formatting documents.

Widow/Orphan control prevents a single word in a line of text being left on its own

Keep lines together prevents any paragraph from breaking across a page.

Keep with next keeps a paragraph on the same page as the following paragraph.

Page break before forces a page break before any new paragraph.

Page, section and column breaks

At times, a break needs to be added to text before the actual end of the page or column. From the layout menu can be found the following options:

- Page break, where one page ends and another begins
- Section break, used to divide a document into sections
- Column break, where column text will stop and start again in the next column.

Using tables

Tables are used in word processed documents to present information in a structured way. They can hold text and/or images. The **Insert Table** dialogue box can be found by selecting **Insert > Table**.

How rows (horizontally) and columns (vertical) are set will depend on the amount of information that is to be added. The width can be set to fill the area where it is inserted, automatically, or a set width can be added.

Right clicking and selecting **Insert** within a cell allows extra rows and columns to be added. Similarly, selecting **Delete Cells** allows a row or column to be deleted.

Insert Table

Table size

Number of columns: 3

Number of rows: 3

AutoFit behavior

Fixed column width: Auto

AutoFit to contents

AutoFit to window

Remember dimensions for new tables

OK Cancel

The icon on the top left of a table is the handle to select and move it.

It may be necessary to merge two or more cells for a heading or title. To do this, click and hold the cursor in one cell and make a selection of other cells. Then select **Merge Cells** from the **Layout** menu.

Table Properties

Table | Row | Column | Cell | Alt Text

Size

Preferred width: 0 cm Measure in: Centimeters

Alignment

Left | Center | Right

Text wrapping

None | Around

Positioning...

Borders and Shading... Options...

Borders and Shading

Borders | Page Border | Shading

Style: All | Grid | Custom

Color: Automatic

Width: 1% pt

Apply to: Table

Options...

OK Cancel

Right click on the icon at the top left of the table to access the table properties. The border, fill and style of the table can now be edited.

Tip

The tools demonstrated for formatting text work exactly the same whether text is typed directly onto a page or it is pasted into a text box, table or shape.

Activity 2

Open the **Abacus leaflet** document you created in Session 3.4 and write a short introduction. Remember the requirements of the document – to provide training information on storage devices and media and their relative advantages and disadvantages for use. Format the text using the skills learned in this session.

Inserting images into a document

As already demonstrated in Units 1 and 2, images can be inserted into a document from many different sources. They may be stored on a CD-ROM of images, saved into a documents area on the computer or imported directly from a digital camera or scanner.

The process and skills for inserting an image into a document (as you covered in Session 1.9) is very similar to inserting an image into a presentation (Session 2.7). These two sessions also demonstrated how to edit and adjust images once they have been added, for example, text wrapping to combine text and images.

Activity 3

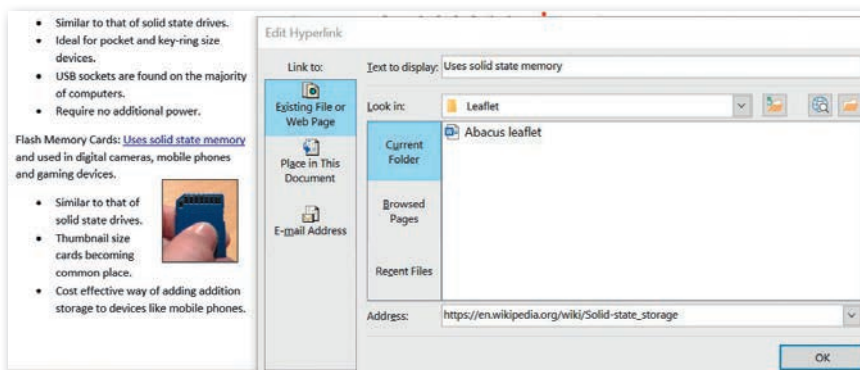
Insert images of storage devices and media into your Abacus leaflet document after referring to the list of devices in Session 3.1. If you need a recap on internet searching and saving files from the internet, refer to Session 1.8. You need to consider the following when doing this.

- How many images can be placed in each column without overcrowding it?
- Each image will need space around it to enable you to add a title and text.
- Make sure there is no overlapping of information in the header or footer.

Make sure you keep saving your work as you progress through the project.

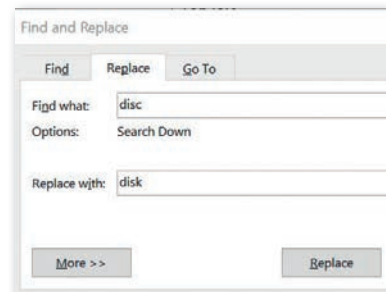
Hyperlinks and bookmarks

Hyperlinks are links from one file to another, this can be on the same computer or across the internet. When creating a leaflet a hyperlink can be used to add a link to a website for further reading. To add a Wikipedia page link to the text '**Uses solid state memory**', simply select the text, choose **Insert** and **Link** from the main ribbon and add a website address as shown.



Tip

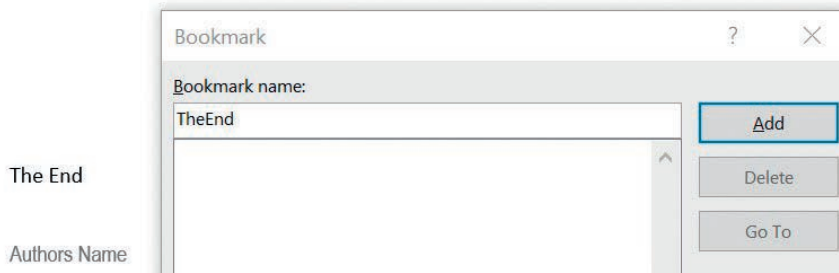
Many words that sound the same have two spellings; disc and disk for example. This will not be picked up by the spelling tool. A useful tool find a specific word and replace it is the **Find and Replace** tool.



Tip

Hyperlinks to an external file or website can be added to any object; text, images or graphic, in most office-based programs.

A bookmark is a saved location within a document. This can be useful in a document of more than one page, and links to a bookmark can be selected as destinations for a hyperlink. Simply select a word or object and select **Insert** and **Bookmark** from the main ribbon. Give the bookmark a name and then this can be selected from the hyperlink options window.



Activity 4

Using the information provided in this unit, and your own additional research, add the following to your leaflet:

- advantages and disadvantages of each type of storage device or media
- hyperlinks to useful research websites
- bookmarks to each section
- a short list of topics at the beginning of the leaflet to add bookmark links to.

Review and revise

You should now be able to:

- enter and edit text and images
- change the font, style and size of text to suit the style of document you are creating
- format text using alignment, line spacing and paragraph tools
- create, edit and complete tables
- position text and images within any document
- add internal bookmark locations and hyperlinks to external websites and files.

SESSION 3.6 Creating a simple data model and chart

Background

Working for Abacus International Bank, you have been asked to create a simple spreadsheet model and chart that can be used to calculate the available storage based on the number of devices and media available. The chart can also be imported into your training document.

In this session, you will find out how to do the following:

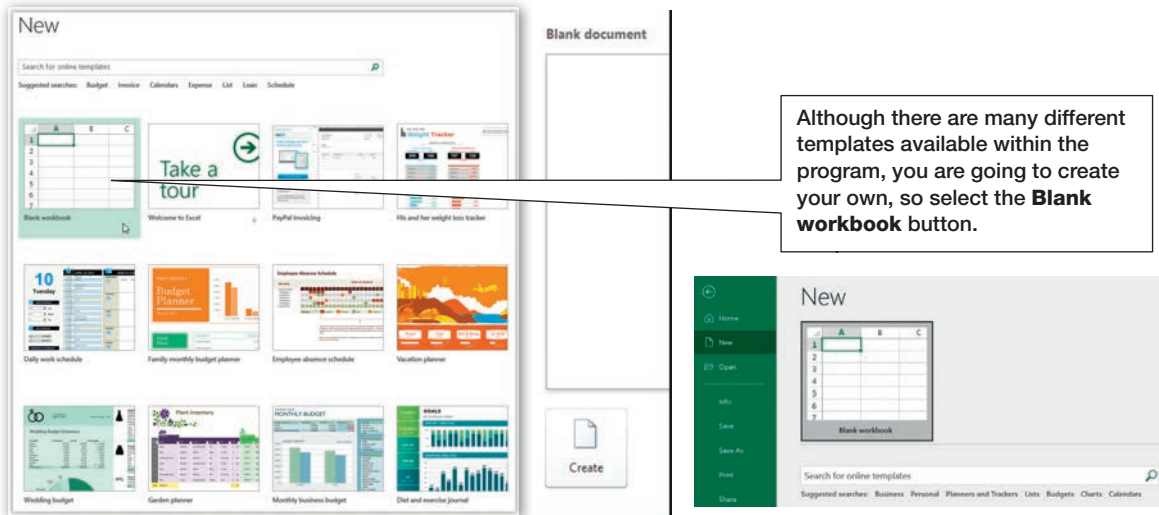
- use basic spreadsheet skills
- create a basic model using appropriate page layout, and using the header and footer
- add accurate data to create a simple chart
- print your work showing values and formulae
- import your chart into your training document
- save your work in a suitable format and location.

Tip

There is a reference chart on the digital download (in the Extra support folder) with an overview of spreadsheet features and functions.

Creating a new document

Below is a common spreadsheet package. Select **File > New** and you will get the following screen.



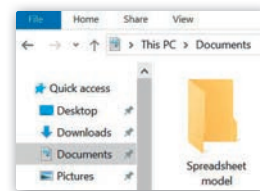
Saving and file location

As already discussed in previous pages, it is important that all files you create have a suitable filename and location. This means that you can regularly save your work as you progress and you will easily be able to find your work at a later date.

Create a folder called SPREADSHEET MODEL within your document area. You will save all the files you create in this project inside this folder.

Data models: basic principles

Before creating your spreadsheet the following steps will guide you through the basics skills required.



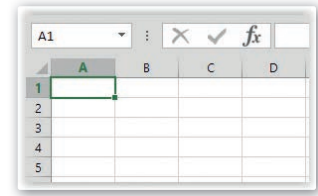
Spreadsheets are made up of the following:

- Columns: go up and down.
- Rows: go across.
- Cells: are where the columns and rows cross.

We refer to cells by their column and row reference.

Where the cell in a spreadsheet is surrounded by a dark band it is known as the active cell. This means that anything you type in will go into that cell – because it is active.

The active cell in the spreadsheet image on the top right of this page is cell A1.



Activity 1

- 1 In which column are the dates of birth?
- 2 In what row can you find Billie Brown's data?
- 3 What is the cell reference for Hassan?
- 4 What is the cell reference of the active cell?

	A	B	C
1	Surname	Forename	Date of Birth
2	Elizabeth	Grace	14 June 1997
3	Brown	Billie	18 August 1997
4	Cheung	Charles	31 January 1997
5	Hassan	Hamal	03 April 1997
6	Eve	Isobel	04 November 1997
7	Wellcome	Wednesday	05 March 1997
8			

Tip

In spreadsheet software, simple mathematical symbols are represented by the following keyboard characters:

- Equals: =
- Add: +
- Subtract: -
- Multiply: *
- Divide: /

In the cells

Cells can contain:

- a number
- a text label
- a formula or function.

The spreadsheet program will recognise the difference between numbers and text. It needs help to recognise a formula, though. To type in a formula you will need to begin with the = symbol.

Activity 2

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Multiplication table	1	2	3	4	5	6	7	8	9	10	11	12
2		1	1										
3		2											

- 1 Open your spreadsheet program to begin a new sheet.
- 2 Type in the words **Multiplication Table** in cell A1.
- 3 Put the numbers 1 to 12 in cells B1 to M1.
- 4 In cell A2 put the number 1.
- 5 In cell A3 put the number 2.
- 6 Make cell B2 the active cell by clicking on it.
- 7 Type in this formula: **=B1*A2**.
- 8 Now complete the rest of the cells adding a formula to each.
- 9 If you have added the correct formulae it should look like the example below.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Multiplication table	1	2	3	4	5	6	7	8	9	10	11	12
2		1	1	2	3	4	5	6	7	8	9	10	11
3		2	2	4	6	8	10	12	14	16	18	20	24

Changing the width of a column

Cell A1 is not wide enough to show all the characters in the cell. This means that you have to make it wider in order to see everything.

Double click on the line between columns A and B.

	A	B	C	D
1	Multiplication table	1	2	3
2	1	1	2	3
3	2	2	4	6

This makes sure that each cell is wide enough for the characters that need to be shown.

Activity 3

Save your work as **Multiplication Table – Your Initials – The Date**. Your filename should look similar to this: **Multiplication Table – ACJ – 13June21.xlsx**. Make sure you save this in your SPREADSHEET MODEL folder.

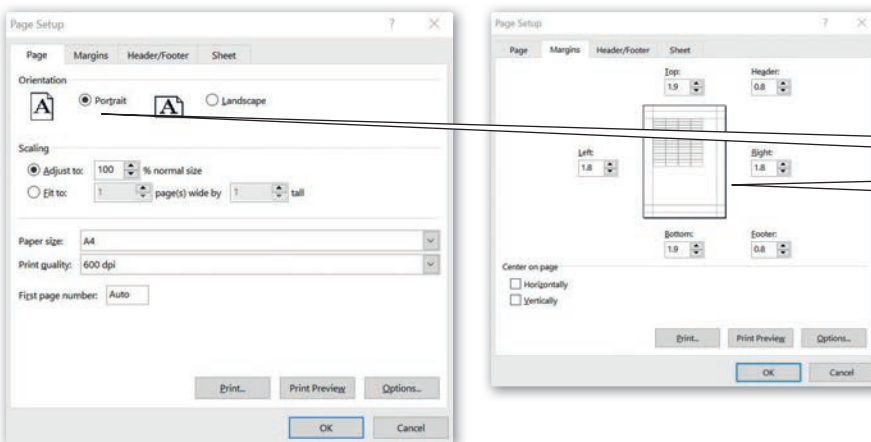
Page setup and using the header and footer

The following steps will show you how to change the page size, orientation and add information to the header and footer.

Select **Page Layout > Page Setup**.

Tip

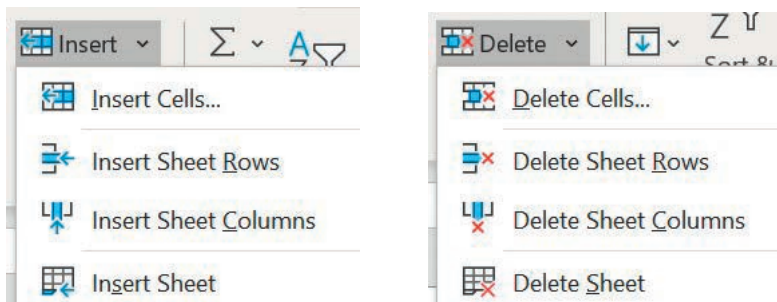
Editing these settings is very similar in the majority of office-based software.



Here you can set the paper orientation, size of margins and footer options.

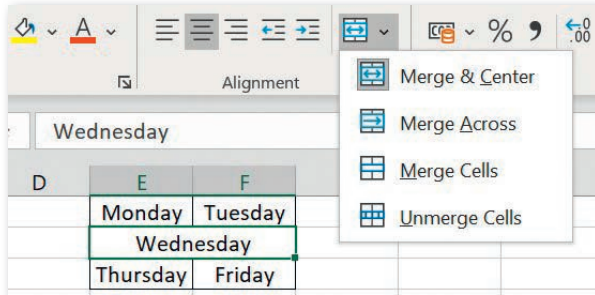
Inserting and deleting rows and columns

Occasionally, you might need to add or remove an additional row or column. This might be just to improve the layout or a column may have been missed with creating a table. The Insert and Delete cells options can be found on the main ribbon. Alternatively, right click on the column letter or row number where you wish to edit cells.



Merging cells

Depending on the layout of a table, it may be necessary to merge two or more cells together. The merged cells then behave as one single cell.

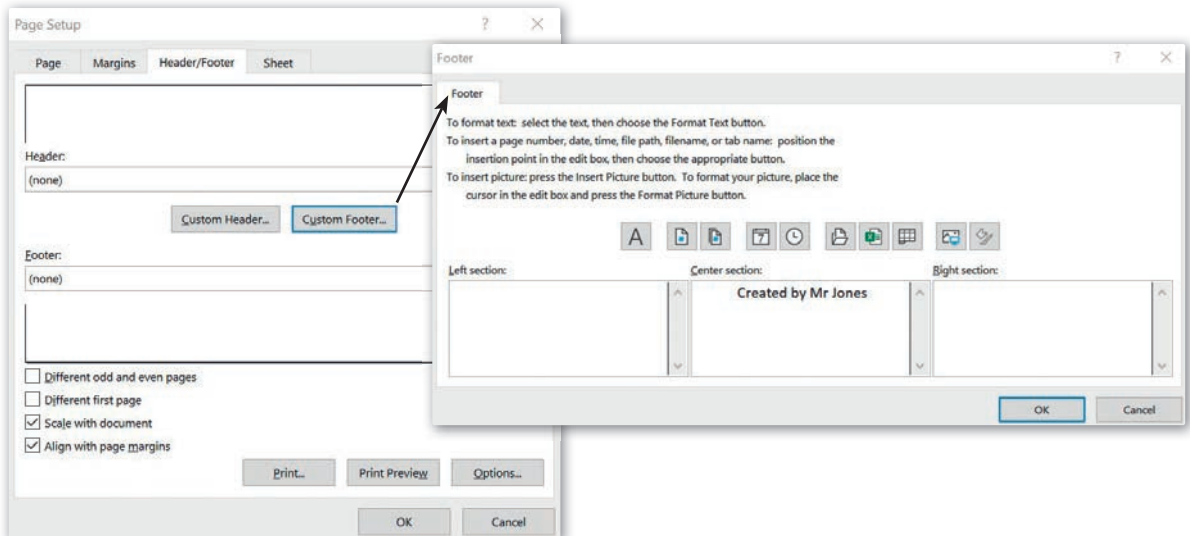


Tip

Merging cells within a table using lots of formulas can cause problems. Merged cells can normally be unmerged using the same toolbar.

Selecting **Header/Footer** allows the header and footer to be customised with the following options:

- custom text
- page numbering
- inserting date and time
- filename and location
- inserting an image.



Activity 4

In the document you created in Activities 2 and 3, experiment with and add the following:

- Suitable page layout, orientation and margin settings for your document. Keep in mind the printing facilities which you have access to.
- Add the title **Multiplication Table** to the header, plus your name and any suitable additional information to the footer.

Creating a simple model and chart

The following steps will show you how to create a simple model and chart that represents the storage capacity of different devices and media you looked at in Session 3.1. This can then be inserted into your training document **Abacus leaflet** from Sessions 3.4 and 3.5.

A simple formula

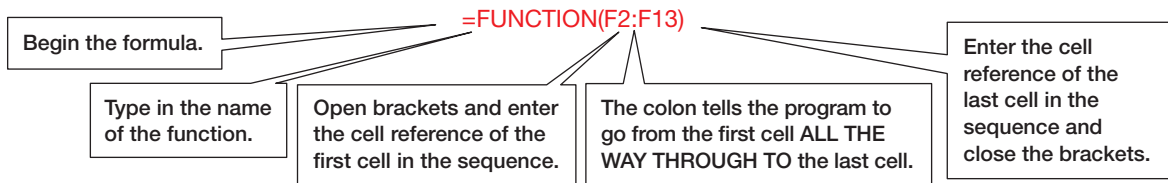
=F2+F3+F4+F6+F7+F8+F10+F11+F12+F13

The program knows that it is a formula because you have inserted the = symbol at the beginning. But this is a long way round of inputting a formula.

Functions

Most spreadsheet programs have functions. These allow you to bypass writing out complicated formulae by using the cell references and mathematical operators.

The functions you need to know about are structured like this:



For the following model you want to use the SUM function.

=SUM(F2:F13)

Activity 5

Using multiplication formulae and the SUM function, create a simple spreadsheet model as a table that calculates the total storage capacity based on the quantities of each device or media. The headings for columns and rows are provided in this table.

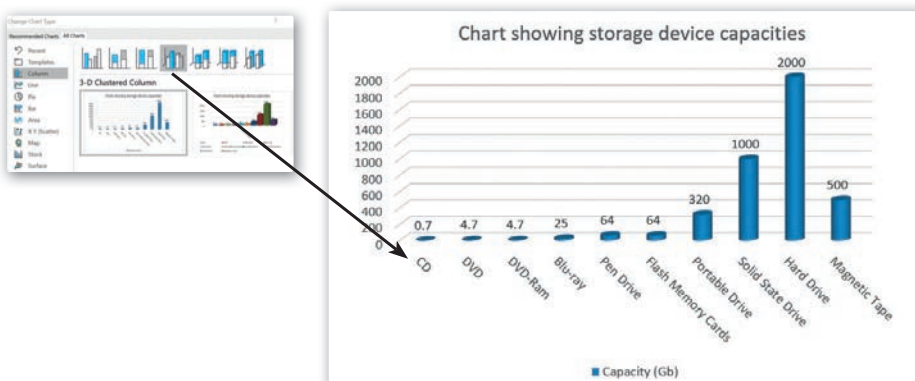
	A	B	C	D
1	Storage Device / Media	Capacity (Gb)	Quantity	Total capacity (Gb)
2	CD	0.7		
3	DVD	4.7		
4	DVD-RAM	4.7		
5	Blu-ray	25		
6	Pen Drive	64		
7	Flash Memory Cards	64		
8	Portable Drive	320		
9	Solid State Drive	1000		
10	Hard Drive	2000		
11	Magnetic Tape	500		
12	Total			

The chart function

Data within a spreadsheet model can be represented visually as a chart or graph.

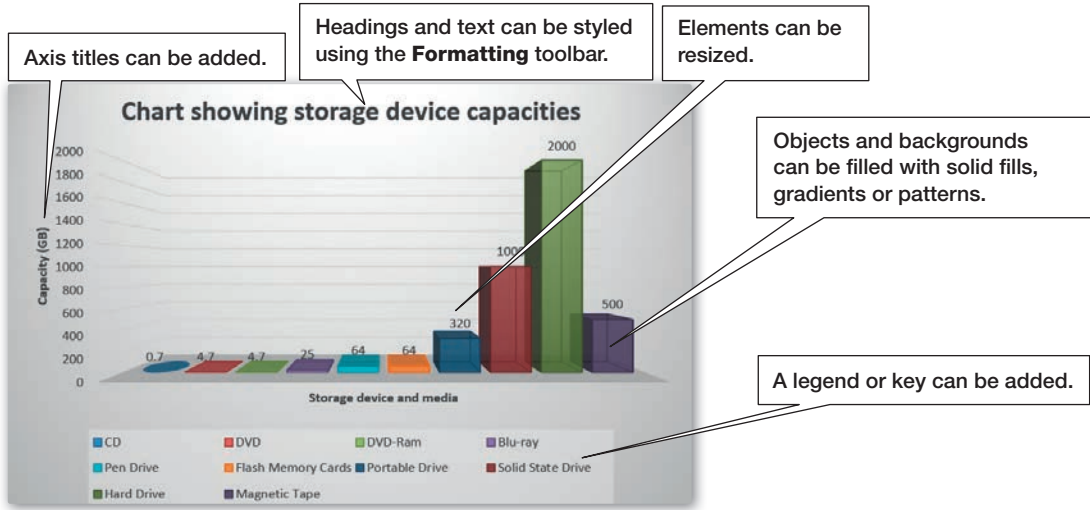
A bar or column chart of some sort would be the most suitable way to represent this data.

Select only the data that is relevant (including headings as shown below) and then chose a chart from the **Insert** menu. The example shown is a 3D column chart.



Customising graphs and charts

Once created, a chart can be customised to user requirements or to match the style of a larger document. The different components can also be selected to be formatted. The steps below demonstrate a selection of customisation.



Activity 6

Using the model created in Activity 5, create a chart that represents the capacities of different storage devices, as requested by Abacus in the introduction to this unit.

Importing a chart into another program

Once created, a chart can be copied into another program by simply using the **Copy** and **Paste** command (or **Paste Special** for more options). **Paste Special** can be found from the main or **Edit** menu.

The first image shows a spreadsheet with a chart titled 'device capacities' and the 'Paste Special' dialog box open. The 'Paste (Link)' option is selected.

The second image shows the 'Paste Special' dialog box with the 'Microsoft Office Graphic Object' option selected in the 'Paste (Link)' list.

The third image shows the 'Abacus International Bank Training document: Storage devices and media' with the 'device capacities' chart imported into it.

Abacus International Bank
Training document: Storage devices and media

Pen Drives: Extremely portable solid-state memory storage devices; designed for personal use and are normally built to use USB sockets.

- Similar to that of solid state drives.
- Ideal for pocket and key-ring size devices.
- USB sockets are found on the majority of computers.
- Require no additional power.

Flash Memory Cards: Uses solid state memory and used in digital cameras, mobile phones

Storage device and media	Capacity (GB)
CD	0.7
Pen Drive	4.7
Flash Memory Cards	4.7
Hard Drive	25
Magnetic Tape	64
Portable Drive	64
DVD	320
Solid State Drive	100
DVD-Ram	2000
Blu-ray	500

Activity 7

Add your chart to your training document. If you have used columns; keep the size within one column and make sure the chart has a title and brief description. Make sure that you save all your work afterwards.

Review and revise

You should now be able to:

- create a simple spreadsheet and save it with a suitable filename in a suitable location
- set the page size, margins and orientation of a spreadsheet
- use the header and footer to add useful information
- add accurate data to create a simple chart and insert it into a word processed document.

SESSION 3.7 Final document checks and presentation

Background

Your employer has asked you to carry out the following tasks before you move onto your next project:

- Print the storage devices and media training booklet as a full colour sample, ready for final checking before going to print.
- Your spreadsheet must be printed so that its layout, functions and formulae can be checked.
- Having already seen samples of your work and being impressed with the quality, your employer has asked you to produce an additional information leaflet.
- Exporting documents into alternative formats, depending on end-user requirements.

In this session, you will find information on the following:

- checking your completed documents for spelling mistakes and visual errors
- using test data to check that a spreadsheet model works correctly
- printing options for each of your documents, including numerical and formula printouts for your spreadsheet model.
- exporting documents into alternative formats, depending on end user requirements
- using compression tools to combine multiple files into one package, suitable for emailing to colleagues.

Tip

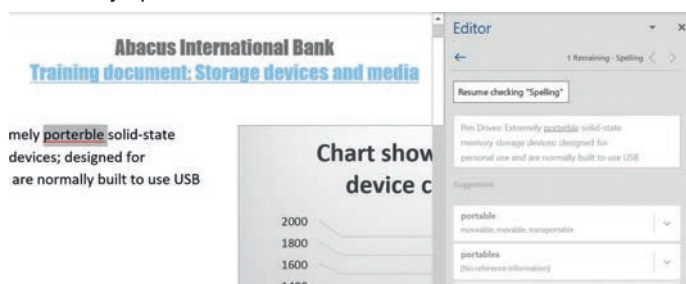
When using the automated spelling and grammar checks of any office-based software it's important to remember that these tools are not guaranteed to correct all mistakes and understand the grammatical variations of every language. They should be combined with visual proofreading and it is essential to ensure the correct language option has been chosen before using these tools.

Spelling and grammar checks

All office software packages have some sort of spelling and grammar checking facilities built in. The following steps will guide you through how to check your documents.

Word processing software

The **Spelling and Grammar** tool can either be found from the Review section of the main ribbon or by simply right clicking over the incorrectly spelt word.

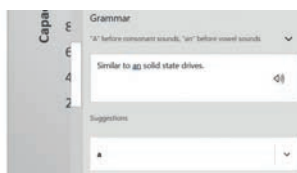


Tip

Although the functionality hasn't changed, sometimes the tool name does. For example in the latest version of Microsoft Word, spelling and grammar functions are found within the **Editor** tool.

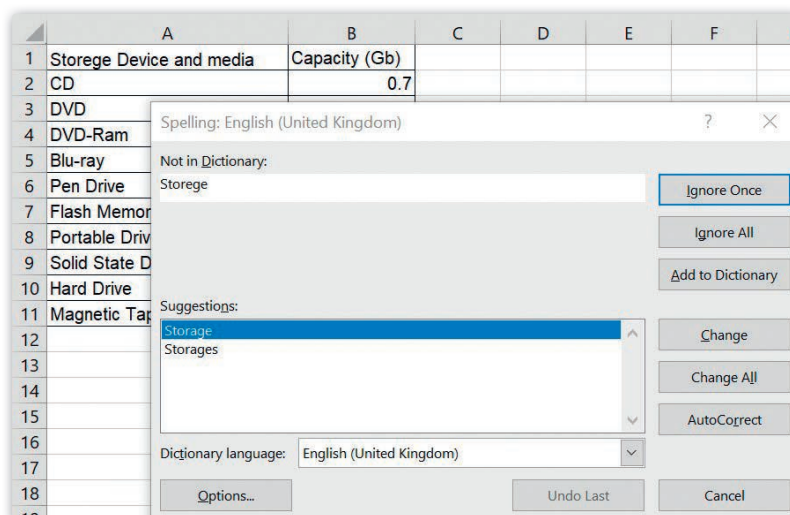
The grammar check works in exactly the same way.

- Similar to an solid state drives.
- Ideal for pocket and key-ring size devices.
- USB sockets are found on the majority of computers.
- Require no additional power.



Spreadsheet software

The process is the same here, although there is no grammar check, just spelling.



Activity 1

Use spelling and grammar tools to check the training guide and spreadsheet model you have created, correcting any mistakes that are identified.

Proofreading and visual checks

Software spelling and grammar checks can make mistakes, and you will miss obvious errors just by reading your work too often. Proofreading and visual checking is the process of letting someone else read and analyse your document – ideally someone who has had nothing to do with its creation and who may fit with its intended audience. The easiest way to do this is to pass out printed copies of your work to friends and colleagues and ask them to annotate it (make notes on the page), indicating any errors they find and making suggestions about its layout or content.

These checks prevent a poor experience for the eventual reader and can also allow any additional pagination to be carried out if required. This may include the following:

- Check for inconsistent line spacing that may be off-putting for the reader.
- Remove any blank pages or slides not being used.
- Remove widow/orphan elements.
- Look for inconsistent or incorrect styles being used within the same document.
- Where tables and lists have been used, ensure they don't cross from one page or column to another.
- Incorrect spelling, not picked up by software, names for example.
- The removal of inconsistent character spacing or sentence case.
- Two adjacent numbers could be reversed, or transposed, and this would not be picked up by a computer but could spoil a spreadsheet or telephone number.

Activity 2

Print a copy of your training guide. Swap with a classmate to look for any errors in content or layout. If possible, give a copy to a family member and ask them to check your work, too. Make changes to your document based on the feedback you receive.

Language

Pagination is the process of analysing the content of any document and making decisions on how it should be divided into separate pages, either electronically or printed. **Widows/Orphans** within this type of publication relate to content spilt across pages, such as the last sentence of a paragraph or a subheading sitting at the bottom of a page and its related content on the next. Although not grammatically incorrect, these can produce a poor experience for the reader.

Spreadsheet testing

Before passing on any spreadsheet model for others to use, it should be tested to make sure that the results it produces are accurate and that any errors are resolved. The simplest way to test the functions and formulae of a spreadsheet is to use sample data that can be easily confirmed. The following examples will guide you through testing formulae.

	A	B
1	Abacus Office File	File Size (MB)
2	Induction Presentation	3.8
3	Training manual PDF	1.2
4	Team photo - Office	5.8
5	Team photo - Counter	5.4
6	Training Video	243.5
7	Advertising Jingle	3.44
8	Holiday Spreadsheet	2.2
9	Staff Database	14.73
10	Saving account letter	1.25
11	Terms & Conditions PDF	42.24
12	Total	323.56

Calculating the total in the example shown is done by using the SUM function. It calculates the answer to be 323.56 MB, but without using a calculator this could be difficult to confirm.

	A	B
1	Abacus Office File	File Size (MB)
2	Induction Presentation	5
3	Training manual PDF	5
4	Team photo - Office	5
5	Team photo - Counter	5
6	Training Video	5
7	Advertising Jingle	10
8	Holiday Spreadsheet	10
9	Staff Database	10
10	Saving account letter	10
11	Terms & Conditions PDF	10
12	Total	75

By changing all the data to 5s and 10s, the answer can be easily confirmed:

$$5 + 5 + 5 + 5 + 5 + 5 + 10 + 10 + 10 + 10 + 10 = 75.$$

Please note that this example is slightly different from the one you created in the previous session.

Activity 3

Create a new simple spreadsheet model using data of your choosing that includes the SUM function. You can also try other functions that subtract, divide and multiply. See the Tip box on page 132 or the reference chart in the digital download (in the Extra support folder) for help with these functions. Carry out tests for each formula using sample data wherever possible. If any of your tests produce an error or an incorrect answer, examine that area with a friend to rectify the problem.

Tip

Most testing errors are the result of an incorrect cell reference or a simple typing mistake. Using basic sample data allows such errors to be found more quickly.

Printing options

When printing any piece of work, there are a number of options to consider:

- Should it be in colour or black and white?
- How many pages should be printed to a sheet?
- What elements need to be seen in the printed version?
- Does the printer setup match the computer's document layout?
- Does the document need collating?

The following steps will guide through the options available to you.

Word processing software

The following options are used in most office software packages. The following options are found by selecting **File > Print** or using a keyboard shortcut **Ctrl+P**.

Print

Copies: 1

Microsoft Print to PDF Ready

Settings

- Print All Pages: The whole thing
- Pages: []
- Print One Sided: Only print on one side of paper
- Collated: 1,2,3 1,2,3 1,2,3
- Portrait Orientation
- A4: 21 cm x 29.7 cm
- Normal Margins: Top: 2.54 cm Bottom: 2.5...
- 1 Page Per Sheet

Callout 1: You can change the number of copies to be printed. Always do a test print before printing multiple copies.

Callout 2: If you are attached to a network, you may have a choice of printers. Choose the most appropriate.

Callout 3: The default setting will print all pages, but you can type in individual page numbers (separated by a comma) or ranges of pages (separated by a dash).

Callout 4: When printing copies of a multi-page document, pages can be collated either to print the whole document repeatedly or to print multiples of the first, then the second page, and so on. To save paper, multiple pages can be fitted to one sheet.

Spreadsheet software

Spreadsheet software uses the same general options as those above, but it also has additional options relating to which specific elements of the spreadsheet are printed.

From the **Print** window, users can select whether to print the page they are currently working on, the whole workbook (if the document uses multiple worksheets) or a specific area already selected.

Print menu options: Orientation, Size, Print Area, Breaks, Background, Print Titles.

Settings dialog options:

- Print Active Sheets: Only print the active sheets
- Print Entire Workbook: Print the entire workbook
- Print Selection: Only print the current selection
- Ignore Print Area

Additional options can be found in **Page Setup**. Refer to pages 122 to 125 for a reminder. Most are self-explanatory. However, the **Row and column headings** option is useful when printing spreadsheets in formula view.

Print

- Gridlines
- Black and white
- Draft quality
- Row and column headings

Comments and notes: (None)

Cell errors as: displayed

Tip

At times you will want to switch between the datasheet view and the formula sheet view. The *Excel* keyboard shortcut is **Ctrl+`** to toggle between the views. Or, select **Formulas** from the main menu and use the **Show Formulas** button.

Activity 4

Print a copy of the following documents produced for Abacus International Bank:

- The storage devices and media guide
- The storage space spreadsheet model in numeric view
- The storage space spreadsheet model in formula view, with gridlines, row and column headings and fitted to one page.

Keeping in mind the printing facilities which you have access to, choose the most relevant settings in regard to page layout, colour and quality. Once complete, make sure all your work is saved with a suitable filename and location.

Activity 5

Your employers are very happy with your work. They are impressed with the way you have combined text and images in the training document and they have asked you to create an additional document before you move on to your next project. They would like you to create an information sheet that outlines the basics of modern banking methods to students who will be visiting the bank hoping to work in the industry in the future. Refer to the information in Session 3.3 on the devices and methods used in banking, and create a leaflet that students can take away with them.

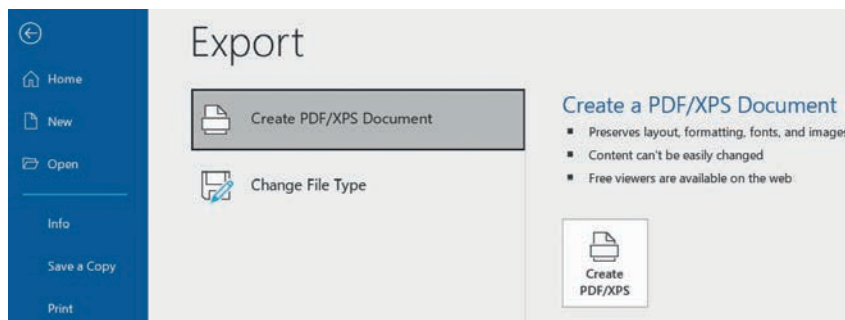
Exporting and compressing documents

Having now created three documents for your employer you have been asked to provide electronic versions that can be sent electronically anywhere in the world. Rather than sending individual files it makes sense to combine the documents into a single compressed format that not only saves file space but means only a single file needs to be either passed on electronically or emailed as an attachment.

To ensure maximum compatibility you have been asked to create portable document format (**PDF**) versions of the files just in case the office applications your colleagues use are slightly different to yours.

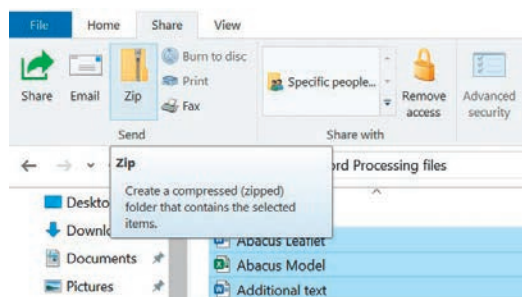
Creating a PDF version of your word-processed documents

From the **File** tab, select the **Export** option and **Create PDF/XPS**.



Creating a compressed package of multiple files

Using **File Explorer**, make sure all the files are together in one folder, select the folder and select **Share** and then **Zip**. This will create a single **compressed** file in the same location that contains all the files you need to share.

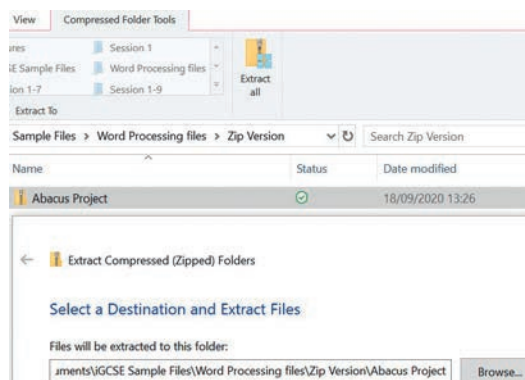


Real world

When compressing files and folders you may see examples using either ZIP or RAR file extensions. Both are compression file types with one key difference. ZIP compression is commonly used and built into operating systems, including Windows and Apple, whilst RAR is a proprietary file format that requires third-party software to use it.

To extract, or un-zip, files from a compressed folder

Using **File Explorer**, select the compressed folder, select the **Compressed Folder Tools** tab and select **Extract All**.



Real world

Creating compressed zip folders of multiple files is very useful but unfortunately it is also a favoured method of sending email attachments containing viruses, disguised as files the recipient has requested. It is important to always check and scan any suspicious email attachments and if in doubt, delete them.

Activity 6

Create a single compressed folder of all the files you have created for your employers including:

- the word-processed documents outlining storage devices and media, and modern banking methods
- the data model of device storage capacities
- PDF versions of all three files for easy viewing.

Review and revise

You should now be able to:

- check any document for spelling and grammar mistakes and correct them using software facilities and proofreading to identify any problems before a document is printed
- use sample test data to test a spreadsheet model and confirm that the functionality you have added works correctly
- use the most suitable printing options in word processing and spreadsheet software to meet the needs of the audience
- use compression tools to combine a selection of documents into one transferrable file that also reduces its overall file size.

3 Practical review

What have you covered?

In the three practical sessions about document production, you have:

- revised and extended your skills for working on documents covered in Unit 1
- entered and formatted text
- created, edited and completed tables
- imported and placed a chart that had been created with a spreadsheet
- checked documents for errors of spelling or grammar.

In the practical session using a spreadsheet, you have:

- created a new spreadsheet and saved it with a suitable filename in a suitable location
- set the page size, margins and orientation of a spreadsheet
- used the header and footer to add useful information
- added text and numerical data to a spreadsheet
- used the SUM function to add values across a range of cells
- created and edited charts to represent data visually
- formatted and styled all elements of a spreadsheet to meet users' needs and produce a professional looking model
- used sample test data to test a spreadsheet model and confirm that the functionality you have added works correctly.

Having created two types of practical document, you have:

- exported office-based documents as PDF documents to maximise their audience
- compressed and zipped a selection of files into one file, suitable for transmission.

Some practice questions

Miss Brown is organising a school trip to a music concert, which includes one of the set pieces for the Cambridge IGCSE Music syllabus that her students are studying.

A poster needs to be created to advertise this concert trip.

- 1 Using a suitable software package, load the file **ConcertPoster.txt**, which contains details for the trip that Miss Brown is organising.
- 2 Work out which lines of text are headings and which are details and apply suitable font, style, sizes, paragraph spacing and colours for them.
- 3 Search the internet to find the URL for the home page of the National Youth Orchestra. Add this URL to the poster in a suitable position.
- 4 Search the internet to find a picture of the inside of the Birmingham Symphony Hall, including the organ. Download and save this image.
- 5 Place the image saved at step 4 in the document so that it creates a banner across the top of the page. Resize and crop the image to achieve this, but make sure the aspect ratio is maintained.
- 6 Search the Cambridge Assessment International Education website (<https://www.cambridgeinternational.org/>) to find the URL of the page for the Cambridge IGCSE Music syllabus. Add this complete URL to the poster in a suitable position.
- 7 Save the poster in two different file formats, one in the native software it was created in and another as a PDF document.
- 8 Using a suitable software package, load the file **Coach.csv**. The spreadsheet shows the seating plan of the coach with two seats either side of the aisle (column C). A booked seat has the person's name in the cell. A "1" (one) in a cell means that the seat has not yet been booked.
- 9 In cell H5, use the SUM function to add up the values in cells A1 to E12. This will tell you how many seats are still not booked.
- 10 In cell H8, create a formula that uses the values in cells H2 and H5 to calculate the number of seats that have been booked.
- 11 Enter 4 into cell H11.
- 12 In cell H14, create a formula, which uses the values in cells H8 and H11 to calculate the amount of money collected (seats booked multiplied by the cost per seat).

- 13 In order for the trip to go ahead, Miss Brown has to have 34 people on the coach.

Type into cell H17: `=IF(H8>33,"YES","NO")`

After entering this, cell H17 should display "NO"

This is known as an 'If' statement, and you'll learn more about this in Unit 6. Alternatively you can look at a description on the spreadsheet features and functions reference chart on the digital download (in the Extra support folder).

- 14 Look carefully at the numerical values in the cells down column H.

Marianna Rodriguez wants to book seat D8. Enter **Rodriguez** into cell D8.

Check that the values in cells H5, H8 and H14 all change.

- 15 Enter 'White' into cell E12.

Cell H17 should now indicate 'YES'. If this does not happen, go back and check your formulae, starting with cell H17.

- 16 In the page header, enter: **Coach bookings for music concert.**

- 17 Use the text alignment buttons to centre all the data in the spreadsheet.

- 18 Adjust the margins and cell widths so that all the data in the cells is fully visible and so that the printout will fit onto one A4 sheet with portrait orientation.

- 19 Save the spreadsheet as **CoachBookings.**

- 20 Create a zip folder of the documents you have created for Mrs Brown so that you can easily email her all the files.

Progress check

Aiming for good progress

As well as the points listed under 'Aiming for good progress' in Unit 1, you can:

Word processing

- enter and format text
- create and complete tables
- check documents for errors of spelling or grammar
- print your work in a suitable size and orientation for the audience
- export files as PDF versions to maximise their viewing potential.

Spreadsheets

- create a new spreadsheet and save it with a suitable filename in a suitable location
- set the page size, margins and orientation of a spreadsheet
- use the header and footer to add useful information
- add text and numerical data to a spreadsheet and format it to suit the users' needs
- use the function SUM and create simple formulae within a spreadsheet
- create charts to represent data visually and import them into a word processed document
- use sample test data to test a spreadsheet model to confirm that the functionality you have added works correctly.

Managing your files and folders you can:

- use suitable file and folder names
- compress multiple files as a single zipped folder to help transfer files electronically.

Aiming for excellent progress

As well as the points listed under 'Aiming for excellent progress' in Unit 1, you can:

Word processing

- enter and format text
- create, edit and complete tables
- check documents for errors of spelling or grammar
- confidently export work in the most suitable electronic or printed format to meet the needs of the audience or target user.

Spreadsheets

- create a new spreadsheet and save it with a suitable filename in a suitable location
- set the page size, margins and orientation of a spreadsheet
- use the header and footer to add useful information
- confidently use the SUM function
- create charts to represent data visually, importing them into a word processed document
- format and style all elements of a spreadsheet to meet users' needs and produce a professional-looking model
- use sample test data to test a spreadsheet model to confirm that the functionality you have added works correctly.

Managing your files and folders you can:

- use appropriate file, folder and sub folder names
- compress and share electronically multiple files as a single zipped folder to meet the needs of the audience.