

COMPUTER APPLICATIONS TECHNOLOGY









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As an organisation rooted in technology, we believe in providing a new bold digital world to communities we operate in. This unique digital book provides the fundamental knowledge necessary for a sound grounding from which to make practical use of the complete and indispensable application-oriented information regarding Computer Applications Technology (CAT) and Information Technology (IT). It is a foundational reference for today's secondary school learners and teachers alike – as well as for the next generation of CAT and IT students.

Computer Applications Technology Grade 11 Practical Book

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Dear learner

Welcome to the *Practical Book for Computer Applications Technology Grade 11*. Please read the information below about the book before you start using it. This book provides you with all the information you need to cover the Grade 11 Computer Applications Technology curriculum. It will also help you develop the skills, attitudes and values you need to be successful in your studies.

Each chapter in the book has the following features, which are meant to help you learn:

Overview

This is an overview of the contents and the units of the chapter.

Learning outcomes

These are the objectives that are addressed in the chapter. It states what you should be able to do by the end of the chapter and gives you an idea of what will be expected of you as a learner. After completing each chapter, ask yourself, 'Am I able to do everything stated in the learning outcomes?'. If not, you should revise the content covered in the chapter.

Introduction

The introduction is a brief summary of why you will be learning the content that is covered in the chapter. Sometimes it will give you a brief background of how far technology has come, while at other times it will just give you a short summary that introduces the content that will follow in the chapter.

Activities

These cover questions you have to answer based on the content presented before them. Activities will help you check whether you have understood the content presented in the book or not.

· 'Something to know', 'Take note' and 'Tip' boxes

The boxes provide extra, interesting content that might caution you to 'take note' of something important; or give you additional information. Note that the content in these boxes will not be part of your exams.

QR Codes, Videos and Screen captures

These will link you to online content. When you are in the eBook, you can easily access the links.

Revision activities

This is a revision activity based on what you have covered in the chapter. Take time to answer the questions on your own. You teacher may also use these to assess your performance during class.

At the end of the chapter

This is a checklist to ensure you understand all the content cover in the chapters. These criteria are linked to the learning outcomes at the beginning of the chapter.

Before getting started, watch the video in the QR code in the margin.



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You can use the QR codes on these pages to link to online content for further information on these topics.

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CHAPTER OVERVIEW

Unit 1.1: File management



By the end of this chapter, you will be able to:

- Understand how a file managing application is used.
- Print a document.
- Use different print options.
- Print to PDF.
- Share a document through email or on the cloud.

INTRODUCTION

Microsoft Word is the most popular word processing program for creating a wide variety of different text-based documents that can be customised to suit your needs. It is simple to use and is packed with features to help you make good-looking, effective word processing documents.

Each new update has brought better and more advanced features to the program, like advanced page layouts and creating a table of contents with a single click.

File management is all about organising your computer, deleting unnecessary files and folders as well as sorting files and folders. In Grade 10, you learned how to restore, move and view files and folders on your computer using a proper file management system. Furthermore, you learned about the different file types.

This activity will refresh your memory of the work you learned in Grade 10.



Activity 1.1

Do this activity on your own and answer the questions that follow:

- 1. Briefly explain what folders (directories) are and their role in file management.
- **2.** What does the figure below show an example of?

C:\School\CAT\Assignment1.docx

- 3. What does the C:\ refer to?
- **4.** Draw a diagram to indicate the following folders and subfolders in a structure (use these names to create folders and subfolders):
 - **a.** You have files for school, gaming (*World of Warcraft* and *DotA*), music, other (Random files) and personal.
- **5.** Describe how the files on a computer can be organised to make it easier to find the appropriate files.
- **6.** Fill in the following table based on these file paths:
 - a. c:\Games\WorldofWarcraft\WoW.exe
 - **b.** e:\Videos\Comedy\Game night.mp4
 - c. c:\Program Files (x86)\Calculator.exe

#	DRIVE LETTER	FOLDER	SUBFOLDER	FILE NAME	EXTENSION
a.					
b.					
C.					

7. Match the term in Column A with the correct description in Column B.

C	COLUMN A		COLUMN B
7.1	Text files	А	This identifies the type of file and how the computer should interpret it.
7.2	.gif	В	In Microsoft Windows, you will find deleted files here.
7.3	Archives	С	This is used to store plain text.
7.4	Folder	D	Animation files are files that interpret moving images
7.5	File extension	Е	You use this to paste files.
7.6	Recycle bin	F	These are the type of files that can combine and compress multiple different files into one file.
7.7	CTRL+V	G	You use this to cut files.
7.8	CTRL+X	Н	Another word for 'directory'.

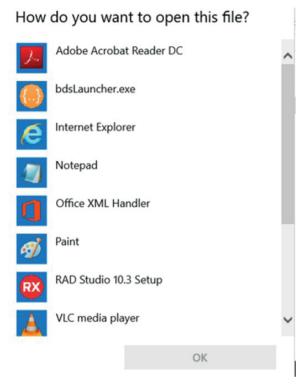
8. List ONE difference between a .txt and .docx file.

... continued

Activity 1.1

... continued

9. You created a word-processing document in Word for your father and saved it as Organogram. When he wanted to open it, Windows displayed the following message (refer to the screenshot below):



When you examined the file, you found that it was saved as follows:

Organogram.dox

- **a.** Explain the importance of file extensions by referring to the scenario above.
- **b.** Explain one way in which the problem can be solved.
- **c.** List two ways screenshots can be taken on a computer.
- 10. Give TWO advantages of file compression.

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1.1 File management

A file manager is a built-in application that is used to organise files and folders. To open the file manager, double select the *This PC* icon. The *This PC* folder will open in a new window. From here, you can start working with your files and folders. When working with a file manager, take note of the following:

- File names should be short.
- File and folder names should indicate the contents.
- File extensions determine the type of program that is used to open that specific file.

Managing your files is all done by selecting *File* in the top left-hand corner of a Word document, which opens the *File* menu:

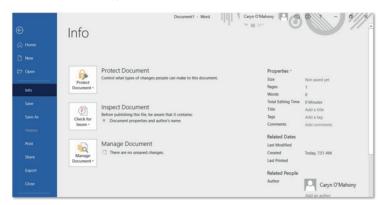


Figure 1.1: Word 2016 File menu

In this menu, you can change or do variety of things with the options here, including change or view properties, set printing options, send the document as either an email, PDF or internet fax, and convert the document to different formats.

In this section, you will learn how to use the *File* menu, or Backstage View, to view and change properties, print and export, send to and share word-processing documents.



Step 1: Open a Word document

Step 2: Select File, Info.

File

 $\begin{tabular}{ll} \textbf{Step 3:} & \textbf{This will open the Backstage View that you will use in this section.} \\ \end{tabular}$



Take note

Note that in all the examples in the subsections below, all the actions will be done in the *File* menu in Microsoft Word. This means that all the steps in the examples will assume you have an open Word document and that you have selected *File* to open the menu.

PROPERTIES

The file properties window shows you a range of information about a file. There you can see the name of the document, given protection, inspection and management options. You can also see all the document properties, including dates on when it was last printed, the last time it was modified and when it was created. You will be able to see who has made changes and who created the document. The *Properties* menu can also give you a link to the file's location on your computer's hard drive.

You can access the *Properties* menu in Microsoft Word to see the properties of word processing documents.



Step 1: Select Info to open the Info page.



Step 2: Select the arrow next to properties.



Step 3: Select Advanced Properties.

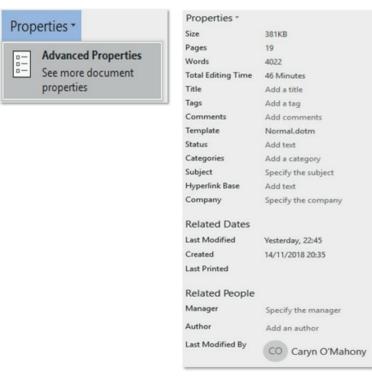


Figure 1.2: Advanced properties



Activity 1.2

- 1. Open Act1.2(CAT).docx
 - **a.** Change the author of the document to your own name and surname.
 - **b.** Insert a title for the document in capital letters. Bold the title.
 - **c.** Write a few sentences about why you chose CAT as a subject.
 - **d.** Change the font to Bookman old style, font size 16.
 - e. Save the document.
- 2. Open the *Act1.2(Answer)* word processing document and use the *2Water* document to answer the questions that follow.
 - **a.** How many paragraphs appear in the document?
 - **b.** What is the first word that appears on line 100 in the document?

PRINTING

When you want or need to print a Word document, there are a number of things you can do to minimise the amount of paper and ink you use. These can be accessed in the *Print* menu after you have selected *File* in the ribbon.

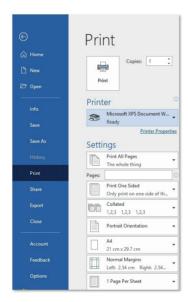


Figure 1.3: Print menu

You can choose to print the entire document or just selected pages (for example, pages 31–40), or only print odd or even numbered pages. You can also choose how many copies you want to print, what quality settings to print at and how many pages per sheet to print. You can also choose to print single- or double-sided copies.



Guided activity 1.3

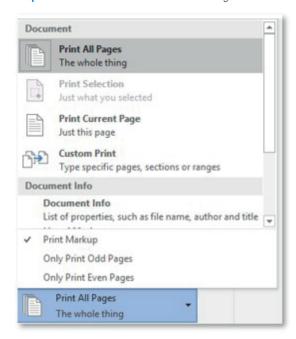
Step 1: Select the *Print* command to open the print settings menu.



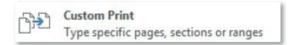
... continued



Step 2: Select the arrow next to Print All Pages.



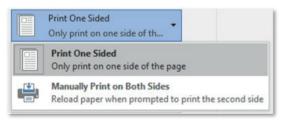
Step 3: Change the setting to *Custom Print*.



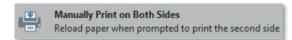
Step 4: Enter the page range in the box the page settings.



Step 5: Select the arrow next to Print One Sided.



Step 6: Select Manually Print on Both Sides.



Step 7: Select *Print*.

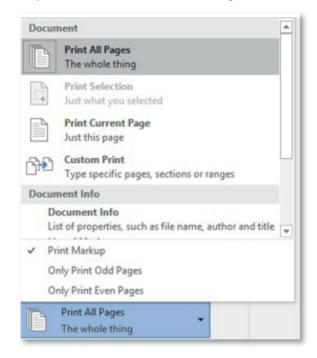




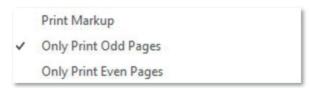
Step 1: Select the *Print* command to open the print settings menu.



Step 2: Select the arrow next to *Print All Pages*.



Step 3: Select Only Print Odd Pages or Only Print Even Pages.



Step 4: Select Print.



To print more than one copy of a document, change the number in the *Copies* box next to the *Print* button.

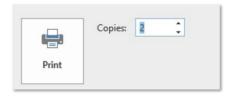


Figure 1.4: Number of copies

To change the quality of the printing, select *Printer Properties* below the name of the printer.

Select the colour: full colour or black. By selecting Economode or Draft mode, ink or toner is saved, as the printer will print in a lower quality.

Lastly, you can choose how many pages you want to print on a sheet by selecting the arrow next to 1 Page Per Sheet and choosing how many pages should be printed on a sheet of paper.

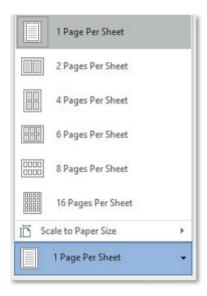


Figure 1.5: Number of pages per sheet

EXPORT/PRINT TO FILE

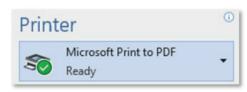
You can also print your Word document to PDF. A PDF is a Portable Document Format file which means that it cannot be changed, but only viewed on the computer. Instead of producing a printed copy of your document (a hard-copy) Word converts the document to a PDF.



Step 1: Select the *Print* command to open the print settings menu.



Step 2: Change your printer to *Microsoft Print to PDF* by selecting the arrow next to the printer name.



... continued

TERM 1 | CHAPTER 1 FILE MANAGEMENT IN WORD PROCESSING | UNIT 1.1 File management

Something to know

Always make sure to select black if you want the printer to use ONLY the black cartridge to print. This is because the printer will still use some of the ink or toner from the colour cartridges to print in grayscale.

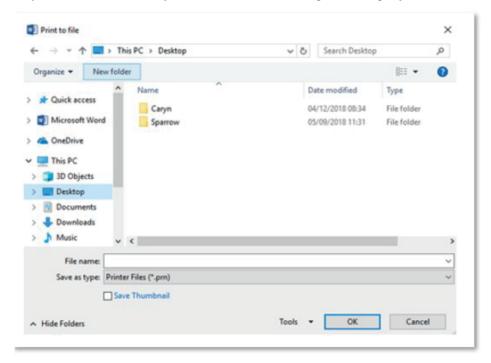
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Step 3: Select Print.



Step 4: Choose where to save your PDF in the *Print to file* dialogue box and give your file a name.



Step 5: Select OK.

Saving different Word documents

You can save your Word document in different file formats. The different file types are:

- **Document saves** the file as *.docx and uses the Word document format.
- Word 91-2003 Document saves the file as *.doc. This eliminates compatibility issues when sharing with people who have older versions of Word.
- OpenDocument Text saves the file as *.odt. This format is compatible with Word and open source applications like OpenOffice and LibreOffice, but you might see formatting differences and some Word features aren't available in .odt files.
- Template saves the file as *.dotx. You can set up styles in a template for different types of
 documents (more on that later) and then use the template to apply those styles to a document
 you created. With a template, there is no need to reformat the document every time you create
 a report, for example.

- Plain text saves the file as *.txt. This format only keeps the text, no images or formatting at all. This also saves space on your hard drive as it can reduce the size of a document substantially.
- **Rich Text Format** saves the file as *.rtf. RTF files keep the formatting information and images but can be opened on other word processing platforms.
- Single File Web Page saves the file as *.mht/*.mhtml. This is a web archive file that holds HTML files, images, animation, audio and other media content.

You can also press *F12* on your keyboard to open the *Save As* menu and choose the file type from the drop-down menu.

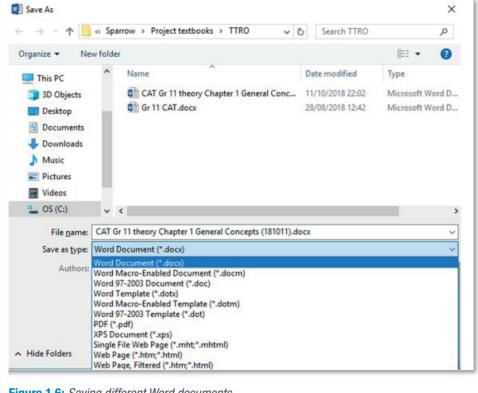


Figure 1.6: Saving different Word documents

SEND TO/SHARE

To share a word processing document, you can choose to send it as an email attachment. When you send a document as an email attachment, you will send a copy of the document to everyone you choose to email.

A word processing document can also be shared to the Cloud. OneDrive, Google Drive and Dropbox are examples of cloud storage.



Note that when you save or print a document to PDF the original document is not replaced by the PDF. The original file will still be available to be edited.

TERM 1 | CHAPTER 1 FILE MANAGEMENT IN WORD PROCESSING | UNIT 1.1 File management

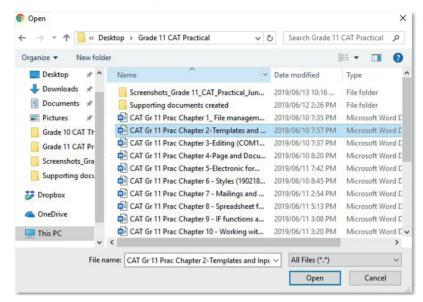
You can share a word processing document using any email program, you just need to attach the file. To do this using Gmail, follow the steps in the example below.



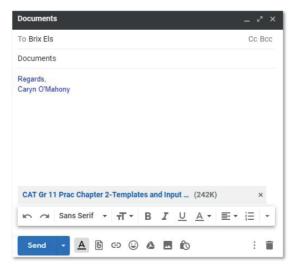
Step 1: In the email window, select the paper clip icon (this indicates an attachment).



Step 2: Select the document you want to send and select *Open*.



Step 3: Once the document has been uploaded, you can select *Send*.

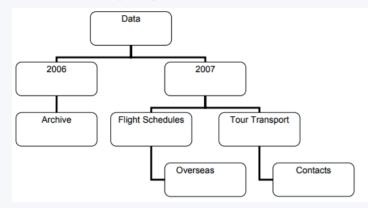




- 1. Open the *PrintToPdf.docx* document.
 - **a.** Save this document as a PDF, using the same file name.
 - **b.** Close the word processing document.
 - **c.** Attach the PDF file to an email and send it to your teacher.

REVISION ACTIVITY

1. The secretary has created the following folder structure on her computer's hard drive, but she needs some help in organising the files and folders. Use the *DATA* folder for this question.



- **a.** Select ALL the files of 2KB in the 2007 folder, and then delete them.
- (2)
- **b.** Move the Archive folder so that it becomes a subfolder of the 2007 folder.
- (2)
- 2. Open the Departures word processing document that is stored in the Tour Transport folder.
 - **a.** Change the author property of the document to your name and surname.
- (2)

b. Make sure the file is Read Only so that it cannot be changed.

- (2)
- **3.** You have been asked to create a printable advert for a new shop opening. There is a women's and children's section.
- (22)
- **a.** Create the advert on a blank word processing document using appropriate alignments, fonts and sizes, tab stops, margins and layout.
- **b.** After you have created this advert, save it as a PDF in the Data folder as Revision Activity PDF.

You will need:

- A logo
- Name for the shop
- At least three items per section with clear pricing
- The different sections (women's and children's)
- Double-line page border
- Margin of 1 cm all round
- Portrait orientation
- Images
- Two pages long

TOTAL: [30]

AT THE END OF THE CHAPTER

	CAN YOU	YES	NO
1	Use file manager on the computer?		
2	Print a document?		
3	Print a document using a range of pages?		
4	Change the number of copies before printing a document?		
5	Use print to PDF?		
6	Send a document using email or the cloud?		



CHAPTER 2

TEMPLATES AND INPUT DATA IN WORD PROCESSING

CHAPTER OVERVIEW

Unit 2.1: Templates and styles

Unit 2.2: Import/export data

By the end of this chapter, you will be able to:



- Use built-in templates.
- Create templates from existing documents.
- Link objects in a word processor.
- Import data from other file formats.

INTRODUCTION

Templates are sample documents that already have some details in place. These details can be changed by the user. The user can then use the template to create, edit and manipulate the document and then save it as a normal word processing document.

2.1 Templates and styles

Templates save the time and effort it takes to set up and style general documents, such as CVs and reports, since they only need to be set up once to be used over and over again. Styles, on the other hand, are predefined ways of formatting text elements in a document, including giving headings specific numbers, font sizes, colours and line spacing.

Microsoft Word comes with a number of pre-built templates for a variety of different types of documents, but it also allows you to create a template of your own with your own styles and document formatting.

In this unit, you will learn how to use pre-built templates in word processing software and how to create your own templates. You will also learn how to change, edit and create styles in a word processing document.

TEMPLATES

A template is a document that is formatted to a specific style. You can change the font type, size and colour using the formatting tools that you have learned about in Grade 10. It also contains fields that you can fill in. These fields are labelled with the information they should contain, which makes creating the document even easier.

CREATING YOUR OWN TEMPLATE

You can create a template from a word processing document. To save a document as a template, refer to the example below.



Guided activity 2.1

Step 1: Open a blank document and create a document to be used as a template. Select *File* and then *Save As*.



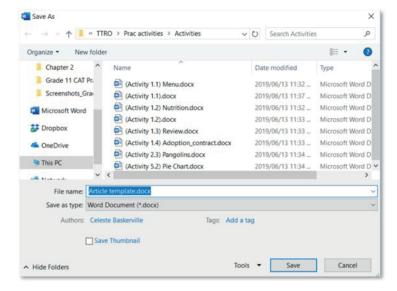
... continued

TERM 1 | CHAPTER 2 TEMPLATES AND INPUT DATA IN WORD PROCESSING | UNIT 2.1 Templates and styles

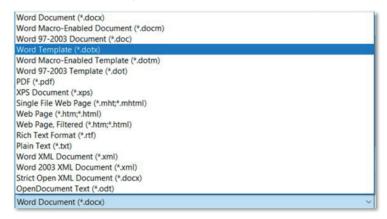
Step 2: Double-click Computer or This PC.



Step 3: Type a name for your template in the *File* name box.



Step 4: For a basic template, select the template item in the *Save as* type list. In Word for example, select *Word Template*.



Step 5: Browse your computer to find the folder you want to save your template to.

Step 6: Select Save.



2

Activity 2.1

- 1. Create a new template.
 - a. Open any one of the in-built letter templates.
 - b. Change the 'Normal' text style to: Colour: Red, Text size: 11 pt.
 - c. Save the document as *MyTemplate* and close the document.
- 2. Convert a document to a template.
 - a. Open Act2.1(Statement).docx.
 - **b.** Next to 'Bill To' section, add a field that will automatically insert the user name of the person using the template.
 - **c.** At the 'Date' section, modify the field so that it automatically inserts the current date.
 - **c.** Save and close the document.
- 3. Create your own template.
 - a. Open a blank document.
 - **b.** Create your CV.
 - c. Create at least one heading style and one font style that you feel will enhance your CV.
 - d. Save and close the document.

2.2 Import/Export data

You can import data from other file formats or even entire files into a word processing document. This will insert the entire content of the file into the document you are working on. You can also use copy and paste to do this, but by using the importing method you will be sure that you do not miss any text to copy.

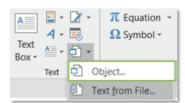
To import data, follow the steps in the following guided activity.



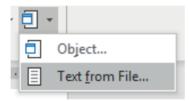
- **Step 1:** Open only the document that you want the data to be copied to. Place your cursor in this document where you want the data be inserted.
- Step 2: Select the *Insert* tab.



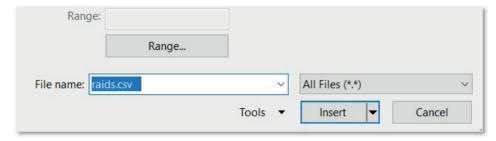
Step 3: In the Text group, select Object.



Step 4: Select Text from File.



Step 5: Choose the file you want to import data from in the pop-up window that appears.



Step 6: Select Insert.



- 1. Import data from a text file.
 - a. Open a new blank Word document.
 - **b.** Import the data from the *Example Data* text file. Make sure that the text is unformatted.

... continued

c. Convert this data into a table (see example below).

Index of th	Index of the volume of mining production								
Month	2009	2010	2011	2012	2013	2014			
Jan	79	86,2	86,4	83,9	89,8	91,2			
Feb	82,6	88,1	90,2	83	88,2	85,5			
Mar	92,6	102,8	102,2	96,5	93	91,6			
Apr	90	90,4	100,5	91	92,2	93,6			
May	98,1	91,5	99,6	102,6	101,7	97,9			
Jun	102,9	103,8	103,2	108,2	103,6	99,5			
Jul	102,3	101,7	96,6	103,8	105,5	100			
Aug	99,1	107,8	102,8	104,6	106,2	98,6			
Sep	99,8	109,5	106,1	98,8	98,8	104,7			
Oct	98,7	103,7	93,3	84,8	105,4	105			
Nov	100,7	108,5	104	99,4	105,3	105,1			
Dec	98,5	106,1	104,7	95,1	104,6	101,5			
Year	95,4	100	99,1	96	99,5	97,9			

- d. Save the document as Example_Data.docx and close the document.
- 2. Import data from a Word file.
 - a. Open a new blank Word document.
 - **b.** Import the data from *2Trade_Handel* as a link.
 - c. Insert a page break. Then on the next page import the data from 1 Water.
 - d. Insert a page break. Then import the data from 2Trade_Handel again, but not as a link.
 - e. Save the document as Trade_Handel(imported) and close the document.

You can import tables and other objects from a spreadsheet into a word processing document.

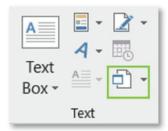


Step 1: Place your cursor in the document where you want to insert the data.

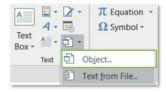
Step 2: Select the *Insert* tab.



Step 3: In the Text group, select Object.

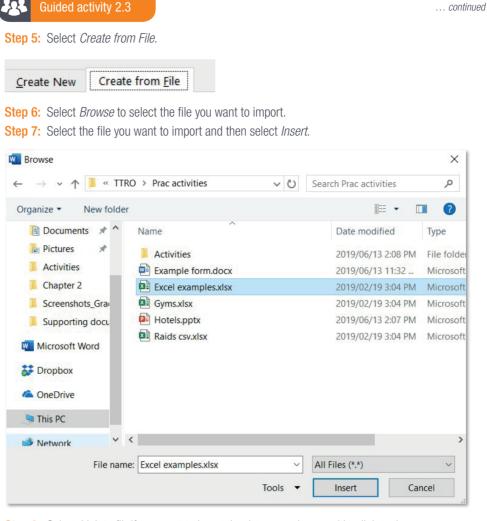


Step 4: Select Object.

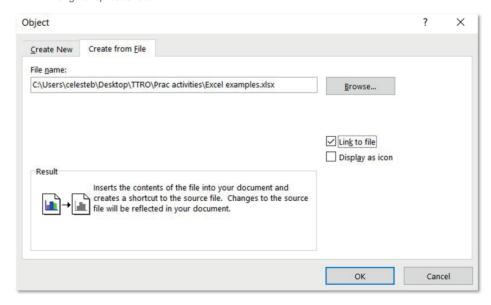


... continued

TERM 1 | CHAPTER 2 TEMPLATES AND INPUT DATA IN WORD PROCESSING | UNIT 2.2 Import/Export data



Step 8: Select *Link to file* if you want to insert the data as an image with a link to the source document. This will ensure that the table in Word will update if you make changes to the original spreadsheet.



 $\dots \ continued$

Step 9: Wait until the data has been imported. You should see something like this:

Student I 💌	Last name	First name	Grade	*	Class numb *	Term *	Term_*	Tem_*	Tern *
1398755752	Andrews	Steven		10	10B	50%	50%	50%	50%
6753284081	Becker	Andries		12	12A	63%	71%	68%	75%
2651281199	Chetty	Amita		11	11E	56%	58%	60%	64%
8179513253	Cline	Elizabeth		10	10A	62%	65%	66%	66%
4522822265	De Jong	Willem		12	12D	75%	77%	77%	79%
5455100907	Dlamini	Kagiso		12	12C	50%	45%	45%	50%
4556651505	Duma	Lerato		11	11C	80%	72%	85%	90%
9857172796	Fischer	Christopher		10	10C	44%	46%	50%	51%
9747248726	Kelley	Grant		11	11B	32%	38%	40%	45%
6769637561	Khumalo	Dineo		10	10D	72%	71%	73%	75%
9421498780	Landry	Andrew		11	11A	51%	60%	65%	60%
5237048214	Matlanyane	Mpho		12	12C	56%	55%	58%	56%
3805686898	Matsepe	Khosi		10	10E	65%	64%	62%	63%
3486544111	Morrison	Richard		12	12B	95%	93%	96%	94%
7455691482	Mthembu	Bongani		11	11B	85%	88%	88%	90%
2421512328	Ngobe	Khethiwe		12	12B	73%	75%	77%	79%
1186090006	Nkopane	Thapelo		11	11D	93%	95%	93%	94%

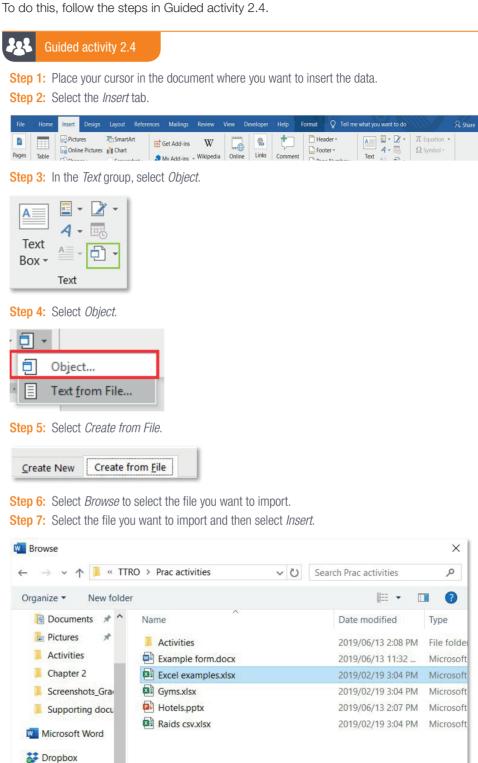


Activity 2.3

- 1. Import data from an Excel document.
 - a. Open a blank Word document.
 - **b.** Import the data from the *2Det_Bes.xlsx* document. Note: Do not import it as a link.
 - **c.** Insert the following as a header to the document: "Grade 11: Name and Surname".
 - **d.** Next to the table, re-import the *2Det Bes.xlsx* document as an icon.
 - e. Insert a page break. Then import the data from 2Det_Bes.xlsx again. This time import it
 - f. Save document as Import_spreadsheet.docx and close the document.
- 2. Use a text file to import data from an Excel document.
 - a. Open a blank Excel document.
 - **b.** Open the text file *Example_Data*.
 - c. Select all the data in Example_Data and copy it.
 - d. Select the first cell the Excel document and paste the data you copied from Example_Data.
 - **e.** Save the Excel document as *NewExampleData.xlsx*.
 - f. Open a blank Word document.
 - g. Import NewExampleData.xlsx as a link.
 - h. Save the document as NewExampleData.docx and close the document.

You can also insert whole files into a word processing document as an object. The benefit of this is that the entire file is saved in the document and can be opened at the same time as the original document, even by other users on other computers. This means that you will not need to send two attachments in an email or make copies of more than one document. It also eliminates the danger of the file path becoming invalid, like when you link to a document.

A file path is the route to follow to find a file that has been saved and shows which directory to search in and which folders you must open to find the file again.



Cancel

All Files (*.*)

Insert

Tools ▼

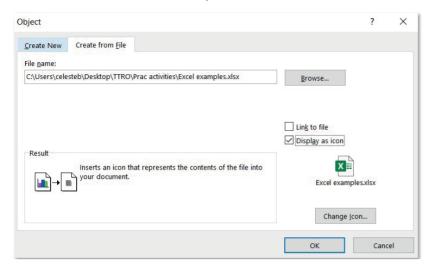
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OneDrive This PC Network

File name: Excel examples.xlsx



Step 8: Select *Display as icon* if you want the file to be imported directly into the Word document. Select *OK*. Click on the icon to open the file.



Step 9: Wait until the file has been created and imported. You should see something like this:

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.



REVISION ACTIVITY

- 1. Open the Chapter 2_Revision Activity word processing document, which contains an overview of the Harvest Food Festival.
 - **1.1** Follow the instructions below to the first page of this document so that it appears similar to the one in the example below.



NOTE: The WordArt and changed picture may appear slightly different from that which is shown below.

- **1.2.** Format the heading "HARVEST FOOD FESTIVAL" as follows:
 - Apply any WordArt of your choice to the heading.

(2)

... continued

TERM 1 | CHAPTER 2 TEMPLATES AND INPUT DATA IN WORD PROCESSING | UNIT 2.2 Import/Export data

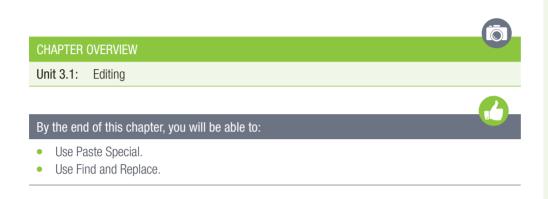
	REVISI	ON	ACTIVITY	cc	ontinued
2.	1.3. 3 The or Make 2.1. (nse gai the Ope	Apply a soft edge of cert the file Fruits.door an icon. Inisers of the festiva of the following changes on the spreadsheet. Copy and paste the of your word proce	that only the fruit and basket display. Eval frame to the picture. Ex as a linked object below the image. The file must be display I needs to know how many learners will attend the festival. Evaluation on page 2: 2 Harvest and work in the Attendance worksheet. Ex information found in the worksheet as a linked table on page	(3)
				HARVEST FOOD FESTIVAL	
		2	VENUE:	Coetzenburg Sports Ground	2
			School		ž.
			Grade		÷
		4	Age		4
		2	Name		3
			Surname		ē.
			Tear-off s	slip	Š
			Ma	ny thanks! We would like to attend	-
			Number of lea	arners	
			Total paymen	ıt	
		8			
			 Merge and cen Remove the ce Insert a row at Change the ou Make sure the Type your infor 	w height of all the rows of the table to exactly 20. here row 11 of the table. Ill borders of rows 10 and 11 of the table as shown. the bottom of the table. tside border of only the bottom three rows to a double-line bor font for the entire table is Cambria and 14pt. mation in rows 4-8.	
	2.2	nse	ert a 3pt shadow-pa	age border for the entire document.	(3)

AT THE END OF THE CHAPTER

Save and close both documents.

	CAN YOU	YES	NO
1	Use a built-in template in a word processor?		
2	Create your own template in a word processor?		
3	Link objects in a word processor?		
4	Import different file formats into a word processing document?		

TOTAL: [30]



INTRODUCTION

In Grade 10, you learned about the basics of editing in a word processor, as well as using Find and Replace. In this section, you will learn about using Paste Special. You will also learn about the different techniques that you can use when replacing in a document.

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3.1 Editing

PASTE SPECIAL

When you are pasting something you have copied, you can choose how you want to paste it. *Paste Special* in Microsoft Word allows you to do various things when pasting from other sources. When you have copied text or graphics from another file, select the drop-down arrow under *Paste* in the *Home* ribbon to see *Paste Special*.



Figure 3.1: Paste special

You will get different options depending on what it is you want to paste. For text, you will get the following options:

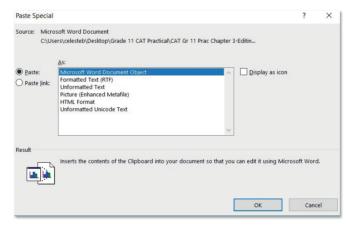


Figure 3.2: Paste Special options for text

For graphics, you will get the following options:

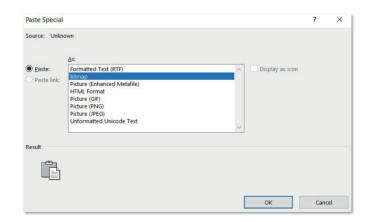


Figure 3.3: Paste Special options for graphics

- 1. Copy and paste text.
 - a. Open a blank word processing document.
 - b. Open the Act3.1(Party) document, and then select the text from the words "Blocos are groups", to the words "suitable for families", then copy the selected text.
 - c. Paste these words without formatting into the new document.
 - d. Then paste the same words with their original formatting.
 - e. Then paste the same words as a Microsoft object.
 - f. Save (with an appropriate name) and close the document.
- 2. Copy and paste pictures.
 - a. Open a blank word processing document.
 - **b.** Open the *Act3.1(Flora)* document, and then select the picture of the flowers and copy it.
 - c. Paste it as a JPEG in the new document.
 - d. Open the Flora document again, and select the text from the words "Fynbos is the major vegetation" to the words "best to exclude them", then copy them.
 - e. Paste it as an image in the new document.
 - f. Save and close the document.
- 3. Copy and paste mixed content.
 - a. Open the Act3.1(Party) document, and then select all the content from the words "Individual Blocos" to the words "popular with young people", copy the selected text.
 - **b.** Paste it as formatted text.
 - c. Insert a page break. Then Paste the same content as unformatted text.
 - d. Save and close the document.

FIND AND REPLACE

As you learned in Grade 10, you can use the Find and Replace function in Word to find and replace words or phrases. You can do this by either selecting Replace in the Home ribbon and opening the menu or by pressing Ctrl+H to open the menu.

There are other replace options you can use, like those shown in Figure 3.4. Once you have opened the Replace command, you need to select More>>.

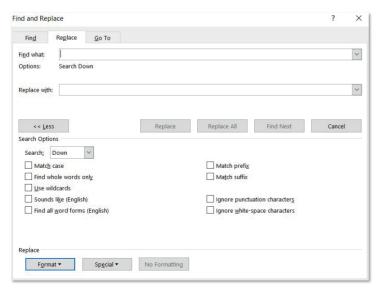


Figure 3.4: Find and Replace options

If none of these replace options have been chosen, all instances of the word will automatically be replaced.

- Find whole words only: For example, if you choose to replace the word "man" with "person", things like "manual" will be changed into "personal". You will then need to go through the document and correct this, which can take a very long time. Tick Find whole words only to prevent this before you replace.
- Match case: If you tick Match case, only words where the case in each character
 matches the search term will be replaced. For example, you would select this if you
 wanted to replace "CAT" the subject (and not "cat" the animal) with "Computer
 Applications Technology". Only CAT in upper case will be replaced.
- Format: You can also replace text that is formatted in a particular way using the Format
 option. For example, if you wanted to replace all the examples of the word "CPU" that
 are in bold with "central processing unit" in green text, you can use that option for
 formatting the text to green.
- **Special:** Using the *Special* option lets you replace punctuation and special characters. For example, you can replace any white spaces with non-breaking spaces, or em dashes (—) with en dashes (—).

In the *Find What* box, type everything you are looking for. Click in *Replace with* and type in the words/phrases which must replace what was typed in the previous box. Do any necessary formatting while in this box.



Activity 3.2

- 1. Find and replace a word.
 - a. Open a blank Word document.
 - b. Open the Act3.2(Statistics) document and select and copy all the text.
 - **c.** Paste the content with its original formatting.
 - d. Find the word 'healthy', and delete it.
 - e. Find the word 'fast food' and replace it with 'fast food'.
 - f. Find the word 'fries' and replace it with 'Fries'.
 - g. Replace the word 'people', with the word 'humans' bolded.
 - h. Save and close the document.
- 2. Find and replace a sentence.
 - **a.** Open the *Act3.2 (Tips)* document, and select the text from the words "Don't believe what you read" to the words "your kid's mud pies", then copy them.
 - b. Paste the content at the end of the document with its original formatting.
 - **c.** Find the words 'healthy food tips' in the document and replace them with 'dietary cuisine suggestions'.
 - **d.** Remove any double spaces. Replace them with single spaces.
 - e. Remove any sentences that start with the words 'Just make'.
 - f. Save and close the document.

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REVISION ACTIVITY

- 1. Open the *Chapter 3_Revision Activity* word processing document and edit and format this document according to the instructions below:
 - a. Adjust the logo to appear as follows: (3)



- **b.** Group the two parts that make up the logo and resize this logo to 5 cm x 5 cm to appear to the left of the words Travel Safely. (4
- c. Set and apply appropriate tabs so that the text below the first paragraph appears
 as follows: (4)

Bali February 2008 R 7 918,00 Iberia June 2008 R 14 135,00

- d. The word "insurance" has been spelt incorrectly as "insurrance". Replace the incorrect spelling with the correct spelling and highlight the corrected text with the colour yellow. (3)
- e. Set the text on only the first page to be fully justified.
- **f.** Set the paragraph spacing in the document to 3pts before and after each paragraph. (3)
- g. The word tour was mistakenly used instead of the word travel. Replace ALL occurrences of the word tour with the word travel in bold.
 (4)
- h. Place a red 2pt border around ALL the text under the first heading ARE YOU PLANNING AN OVERSEAS TRIP?.
- i. Use the document: 3Highlights.docx. Copy the text in this document and paste special as a Microsoft Word Document object at the bottom of the document.
 (4) Save and close the document.

TOTAL: [30]

(2)

AT THE END OF THE CHAPTER

	CAN YOU	YES	NO
1	Use Paste special in a word processor for different file types?		
2	Use find and replace in a word processor?		
3	Use the different options available in word processor to find and replace word/s in a document?		

TERM 1 | CHAPTER 3 EDITING | UNIT 3.1 Editing



PAGE AND DOCUMENT LAYOUT

CHAPTER OVERVIEW

Unit 4.1: Page layout and design

Unit 4.2: Document layout

Unit 4.3: Paragraphs

By the end of this chapter, you will be able to:



- Add themes and cover pages to Word documents.
- Add section breaks and headers and footers to Word documents.
- Customise bullets and numbering in paragraphs.

INTRODUCTION

In this section you will learn to select themes and cover pages to enhance your word processing documents. You will use section breaks, headers and footers to give your documents a more professional look. and lastly, you will find out how to customise bullets and numbering in your documents.

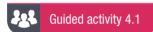
4.1 Page layout and design

THEMES

Microsoft Word comes with a variety of themes designed to allow you to customise documents instantly. Each theme uses a variety of colours, fonts and styles to make the document consistent without you needing to create a template for the document.

Themes are found under the *Design* tab in Microsoft Word. You can customise themes by changing the colours, font, paragraph spacing and effects in the document. You can then choose to set your created theme as the default theme for Microsoft Word documents.

Using themes allows you to format the whole document quickly, especially if you have used the *Styles* in the *Quick Style* gallery to apply headings and title styles to sections in your document. Themes do not overrule the style, but enhances the style (for example, making all the level 1 headings the same colour).



Step 1: Select the Design tab.



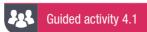
Step 2: Select a theme.



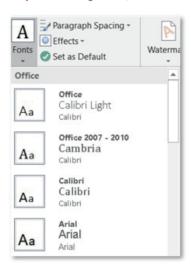
Step 3: To change colours, select Colors and select the colour scheme you prefer.



... continued



Step 4: To change fonts, select Fonts.



You can format the text elements in a theme exactly the way you would format text that has not been styled using a theme.

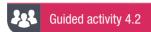


Activity 4.1

- 1. Apply a theme.
 - a. Open a blank word processing document.
 - **b.** Import the text from *Act4.1(Guide)* with its original formatting.
 - **c.** Apply the Crop theme to the document.
 - d. Save the document as Act4.1(Guide_Theme) and close the document.
- 2. Change a theme.
 - a. Open a blank Word document.
 - **b.** Import the text from *Act4.1(Guide)* with its original formatting.
 - **c.** Apply the Headlines theme (or any theme on the computer).
 - d. Change the theme colour to Red Orange.
 - e. Change the page colour to an appropriate background of your choice.
 - f. Change the theme font to Century Gothic.
 - g. Save the document as Act4.1(Guide_Theme2) and close the document.
- **3.** Create your own theme.
 - **a.** Import the text from *Act4.1 (Guide)* in its original formatting.
 - **b.** Apply any theme of your choice.
 - **c.** Create and apply your own customised theme colour. Name it 'MyStyle'.
 - **d.** Create and apply your own theme font. Name it 'MyFont'.
 - e. Add a page border.
 - **f.** Save the document as *MyTheme.docx* and close the document.

COVER PAGE

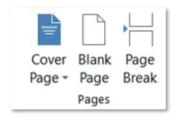
You can also add attractive cover pages to documents using built in tools. To insert a cover page, follow the steps in Guided activity 4.2 below.



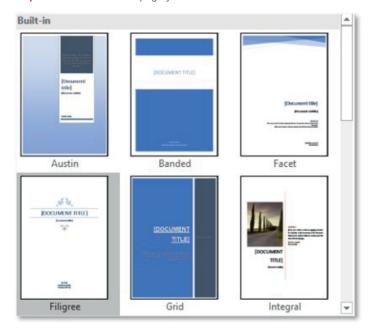
Step 1: Select the *Insert* tab.



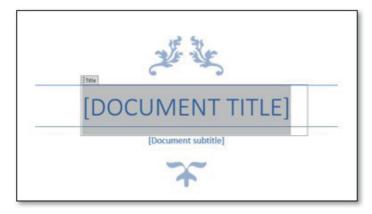
Step 2: Select Cover Page.



Step 3: Choose the cover page you want.



Step 4: Complete the text fields with your own text on the cover page.



Using a cover page is very important for large documents and reports. In your PAT, you will need to use a cover page that will have all your personal details on it, making it easier for your assessor to see who the document belongs to.



Activity 4.2

Complete the following activity on your own.

Note: Go to the options setting and change the 'User name' field to your name and surname.

- 1. Apply a cover page.
 - Open a blank document.
 - Apply a cover page of your choice.
 - Assume that this cover page is for an essay about global warming. Fill in the empty fields (placeholders) on the page with appropriate content.
 - Save the document as GlobalWarming and close the document.
- 2. Create a cover page.
 - Open a blank document.
 - Apply a cover page of your choice.
 - Change the position of at least ONE element on the page.
 - Change the colour of at least ONE element on the page.
 - Change the font size of at least ONE element on the page.
 - Insert and position a text box of your choice.
 - In the text box write a short paragraph explaining what elements you have changed on the cover page.
 - Save the document as *CoverPage* and close the document.

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4.2 Document layout

Section breaks are used to divide documents into sections to format individual pages. Each page can have different layouts including columns, headers, orientation and spacing. In this unit, you will learn about the different types of section breaks.

SECTION BREAKS AND SECTIONS

There are different types of section breaks:

• A Next Page section break starts the new section on the following page.



 A Continuous section break starts the new section on the same page. One of the most common reasons for using this type of section break is if you're using columns. By using this sort of section break you can change the number of columns without starting a new page.

$This chapter-will-refresh-your-memory-on-the-basics-of-how-computers-work, the different-types-of-computers-there-are-and-their-typical-features. You-will-then-learn-about-how-computers-are-categories-and-how-ICT-has-made-the-workplace-a-faster, -more-efficient-place-to-be. \P$
¶Section Break (Continuous)

 An Even Page section break lets you start a new section on the next evennumbered page.

This-chapter-will-refresh-your-memory-on-the-basics-of-how-computers-work,-the-different-type there-are-and-their-typical-featuresYou-will-then-learn-about-how-computers-are-categories-are made-the-workplace-a-faster,-more-efficient-place-to-be¶	
Section Break (Even Page)	

 An Odd Page section break lets you start a new section on the next oddnumbered page.

This·chapter·will-refresh·your·memory·on·the·basics·of·how·computers·work,·the·different·types·of·comput	ters-
there-are-and-their-typical-features. You-will-then-learn-about-how-computers-are-categories-and-how-ICT-I	nas-
made-the-workplace-a-faster, more-efficient-place-to-be. ¶	
Section Break (Odd Page)	

 Apart from Section Breaks you will also notice Page Breaks, these will not create a new section, but will move text below the break to the top of a new page:

$This `chapter-will-refresh-your-memory-on-the-basics-of-how-computers-work, the `different-types-of-computers-there-are-and-their-typical-features. You-will-then-learn-about-how-computers-are-categories-and-how-ICT-has-made-the-workplace-a-faster, more-efficient-place-to-be. \P$
Page Break

• A *Column Break* is used when a page is divided into columns and you want to move text to the top of a column.

```
This-chapter-will-refresh-your-memory-on-the-basics-of-how-computers-work, the-different-types-of-computers-there-are-and-their-typical-features. You-will-then-learn-about-how-computers-are-categories and-how-ICT-has-made-the-workplace-a-faster, more-efficient-place-to-be. •¶

Column Break
```

When working with breaks remember to use Show/Hide to see where the breaks are placed.

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Guided activity 4.3

Step 1: Place your cursor where you want the section break to start.

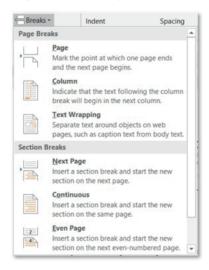
 $This - chapter-will-refresh-your-memory-on-the-basics-of-how-computers-work, - the-different-types-of-computers-there-are-and-their-typical-features. - You-will-then-learn-about-how-computers-are-categories-and-how-ICT-has-made-the-workplace-a-faster,-more-efficient-place-to-be. - \P$

Section Break (Continuous)

Step 2: Select the *Layout* tab.



Step 3: Select the drop-down arrow next to *Breaks*.



Step 4: Select the type of break you want to use. It will be inserted where you placed your cursor. The section break we chose here was *Next Page*.



Activity 4.3

Complete the following activity on your own.

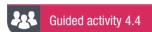
Use section breaks.

- Open a blank Word document.
- Import the content from Act4.3(1Artists) in its original formatting.
- Insert a continuous section break after the words "in South Africa (insert citation here).".
- Insert a next page section break after the words "engages with issues in modern culture.".
- Insert an even page section break after the words "multiple exhibitions in South Africa and abroad.".
- Insert an odd page section break after the words "internationally as well as in his home country.".
- Insert a column break after the words "attraction and repulsion that cowhide evokes in the viewer.".
- Save the document as Artist(Your Name) and close the document.

HEADERS AND FOOTERS

Headers and footers are usually used in multi-page documents to give descriptive information about the document, such as the title, revision date, author's name or even images. This is also where page numbers are inserted.

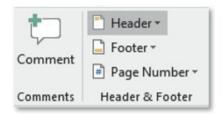
Using headers and footers together with sections allow you to add different numbering styles to different sections. For example, the first few pages of a document contain Roman numbers (i, ii, iii, etc.) and the rest of your document Arabic numerals (1, 2, 3, 4, etc.).



Step 1: Select Insert.



Step 2: Select Header or Footer in the Header & Footer group.



Headers and footers use different information depending on what type of document you are creating. This could be a date, the name of the document or even the author's name.

Guided activity 4.5

To add a date and time (that can be automatically updated):

• Double click on the *Header* or *Footer*.

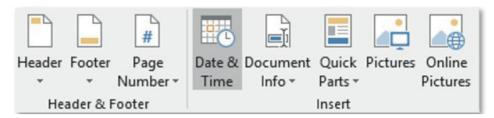


... continued

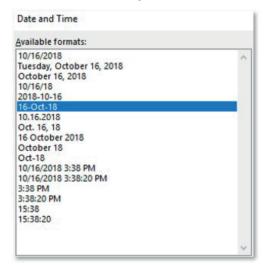
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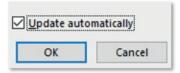
Select Date & Time in the Insert group.



• Select the date format you want to use.



• Tick the box for *Update automatically*.



• Select OK.

To insert the file path, file name or author name:

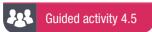
• Double click on the *Header* or *Footer*.



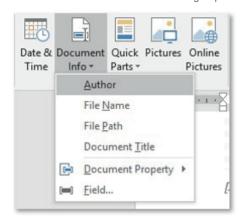
... continued

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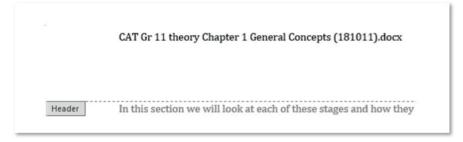
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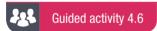
Select Document Info in the Insert group.



- Select the appropriate item, in this case, it is the *File Name*.
- This should automatically insert the information you selected.



When you use different sections, you can choose to link or unlink your headers and footers. The headers and footers in a Word document are automatically linked to each other across sections. To unlink (or re-link) headers and footers, follow the steps in the example below.



Step 1: Double-click in the header or footer of the section you want to unlink.



Step 2: Select the *Design* tab under *Header & Footer* tools.

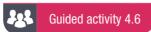


... continued

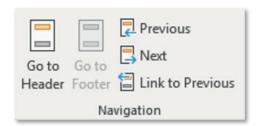


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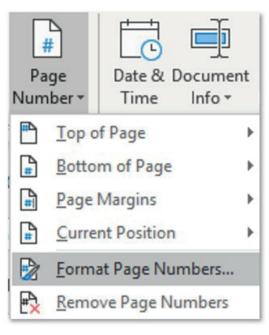


Step 3: Select *Link to Previous* to unlink your header or footer from the previous section.

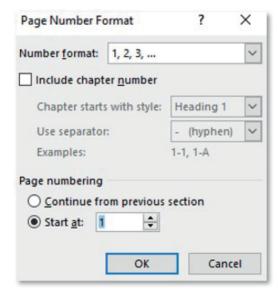


If your sections are unlinked, you can select Link to Previous to link them again as well.

Step 4: Select the arrow next to *Page Number* in the *Header & Footer* group.



Step 5: Select Format Page Numbers and then select Start at.



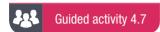
Enter the number you want to start with and then select *OK*.

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Page numbers help you track where you are in a document and are useful when the document has been printed and you need to sort it.

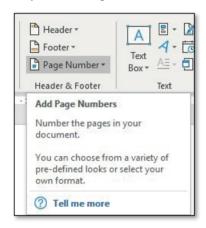
You can have different types of page numbers as well – you can choose to have the first page be different from the rest (for example, not have a number), you can choose to have different page number layouts for odd and even pages, and you can even start numbering your document at a specific number.



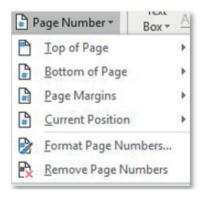
Step 1: Select Insert.



Step 2: Select Page Number.

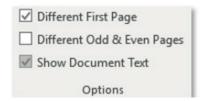


Step 3: Choose where you want the page numbers to be.



Step 4: Choose the type of page numbering you want.

Step 4a: To have a different first page, make sure the Different First Page box is ticked.



... continued

TERM 2 | CHAPTER 4 PAGE AND DOCUMENT LAYOUT | UNIT 4.2 Document layout

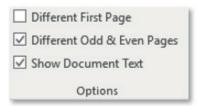
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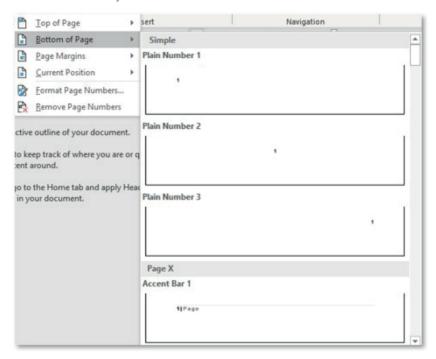
Guided activity 4.7

... continued

Step 4b: To have numbering for odd and even pages, tick *Different Odd & Even Pages*. If you have selected this option, remember that you will have to insert the page number in both an Odd page and an Even Page to be displayed.



Step 4c: Go to the *Header* or *Footer* tools and select the style that you want to use. You can also do this manually.



Step 4d: Use the *Format Page Numbers* menu (in the *Page Numbers* drop-down) to either have numbers carry on when there is a section break or to start numbers from a specific number.



Activity 4.4

Complete the following activity on your own.

- 1. Apply headers and footers.
 - Open a blank Word document.
 - Import the text from Act4.4(Global).
 - Insert the Facet (Even page) header.
 - Change the header's font colour to yellow, bold, 14 pt.
 - Insert the Facet (Odd page) footer.
 - Change the footer's title to 'African Art'.
 - Change the footer's subtitle to 'Copyright@2019'.
 - Save the document as GlobalHeader(YourName) and close the document

... continued



Activity 4.4

... continued

- 2. Modify the header and footer elements.
 - Open a blank Word document.
 - Import the content from the document Act4.4(Top15SA), in its original formatting.
 - Change the footer as follows:
 - Align the page number in the centre.
 - Add the author name and align it to the right-hand side.
 - Change the header as follows:
 - Add the date (YYYY-MM-DD) that automatically updates on the right-hand side.
 - Add the file name and align it to the left-hand side.
 - Save the document as *Top15SAHeader(YourName)* and close the document
- 3. Unlink and link footer sections.
 - Open a blank Word document.
 - Import the content from Artists in its original formatting.
 - Add a next page section page after the words "multitude of cultures surrounding them.".
 - On the first page, Use Page Number to align the page number to the bottom left.
 - Change the numbering format for the section before the section break to A, B, C, etc.
 - Restart the numbering for the section after the section break.
 - Save the document as ArtistsFoooter(YourName) and close the document.
- 4. Unlink and link header and footer sections.
 - Open a blank Word document.
 - Import the content from Artists in its original formatting.
 - Add a page break after the words "that engages with issues in modern culture.".
 - Add a next page section page after the words "multiple exhibitions in South Africa and abroad.".
 - Add an odd page section break after the image below "Figure 3: Freedom Fighters 2024".
 - Add a next page section page after the words "internationally as well as in his home country.".
 - On the first two pages:
 - Use Page Number to add the page numbering on the top of the page (centre aligned).
 - Remove the numbering on the footer of the first 2 pages.
 - On page 3:
 - Use Page Number to add the page numbering on the top of the page (left aligned).
 - Remove the numbering on the footer.
 - On the last two pages:
 - Use Page Number to add the page numbering on the top of the page (centre aligned).
 Hint: Use the Plain Number options.
 - Save the document as ArtistsPageNumber(YourName) and close the document.



Take note

Go to the options setting and change the 'Username' field to your name and surname.



HINT

Use the *Plain Number* options in all cases.

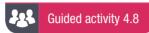


Take note

Make sure that the appearance of the odd and even pages match.

4.3 Paragraphs

In Grade 10, you learned how to apply basic formatting to a paragraph and how to add bullets or numbering to your text. You can customise these bullets and numbers by using the tools in the *Paragraph* group in the *Home* ribbon.



Step 1: Select the text section you want to have in a list.

To play soccer for a school team, all students must have the following equipment:

Soccer boots

Game kit (jersey, shorts and socks)

Practice kit (jersey, shorts and socks)

Shin guards

Water bottles (2 per player)

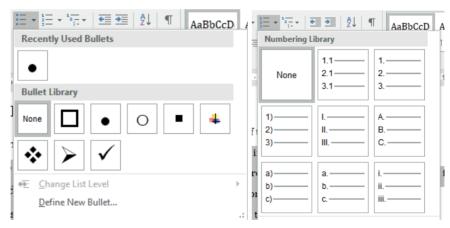
Kit bag

Goalkeeper gloves (if the player will be or is playing in the goalkeeping position)

Step 2: Select Bullets or Numbering in the Paragraph group.



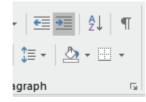
Step 3: To change the bullet or number style, select the drop-down arrow and select the bullet/ number you want to use.



Step 4: To change the level of the bullet/number, place your cursor on the line you want to change.

- Describe the information processing cycle.
- · Discuss different types of computers and their typical features.

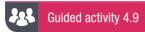
Step 5: Select Increase Indent or use the Tab key on the keyboard.



MULTI-LEVEL LISTS

Sometimes you will need lists with multiple levels. If your levels are not too complex (for example, you need a sub-bullet under a main bullet), you can very often just place your mouse cursor at the start of the sentence you want to make a second level and press *Tab* on your keyboard. This will automatically move the bullet or number further from the margin and add a different number or bullet style at the start.

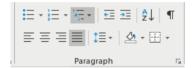
However, when your list becomes complex (such as numbered headings or multiple lists in lists), you will need to set up a multi-level list.



Step 1: Select the text or numbered list you want to change.



Step 2: Select the arrow next to *Multilevel List* in the *Paragraph* group on the *Home* tab.



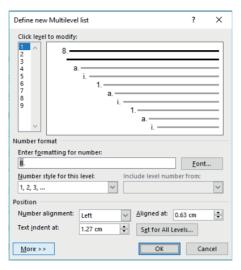
Step 3: Select Define New Multilevel List.



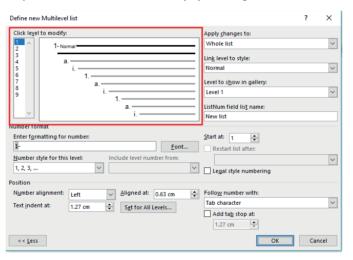
... continued

TERM 2 | CHAPTER 4 PAGE AND DOCUMENT LAYOUT | UNIT 4.3 Paragraphs

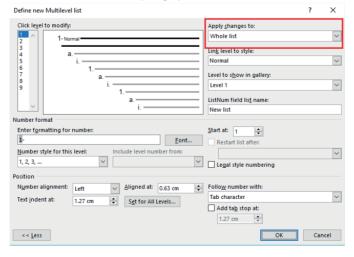
Step 4: Select *More* in the bottom left corner to expand the *Multilevel list* dialogue box.



Step 5: Choose the list level to modify by selecting it in the list. 1 is selected by default.

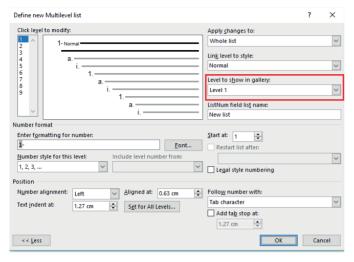


Step 6: Choose where you would like to apply your changes by selecting *Whole list, This point forward* or *Current paragraph*.

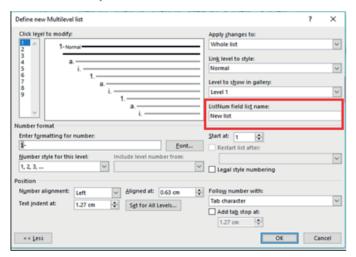


... continued

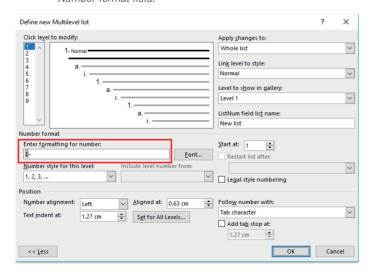
Step 7: Choose the number to show in the gallery. Level 1 is shown by default.



Step 8: Give the multilevel list a name in the *ListNum field list name*. This name will appear wherever you see the *Listnum* field.



Step 9: To add a dash, brackets or other value to the end of the numbered list, enter it in the *Number format* field.



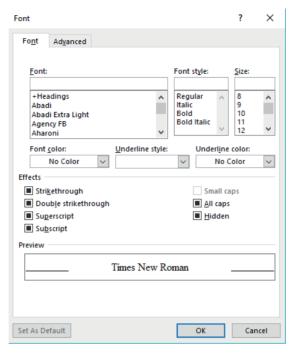
... continued

TERM 2 | CHAPTER 4 PAGE AND DOCUMENT LAYOUT | UNIT 4.3 Paragraphs

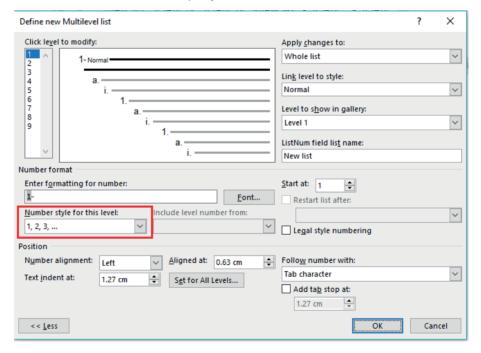
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Step 10: To change the font size, style and colour, select *Font* and choose a setting on the *Font* tab or *Advanced* tab.

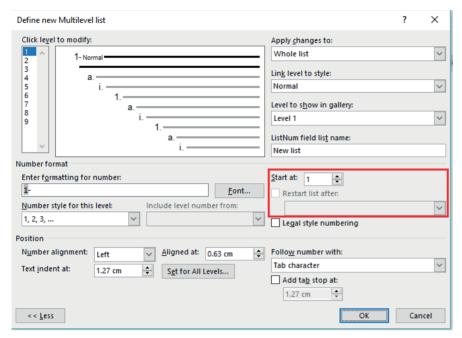


Step 11: To change the style, select the down arrow next to *Number style* and choose numbers, letters or another format. Specify a level number to include this from.

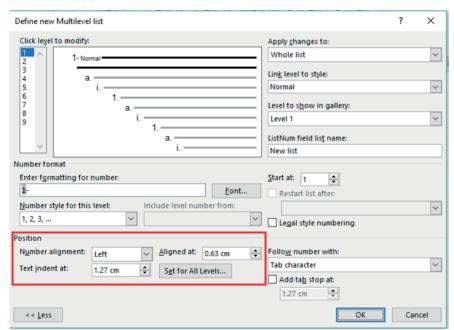


... continued

Step 12: Choose the number the list should start at. The default value is 1. To restart numbering after a specific level, select the *Restart List After* check box and choose a level in the list.



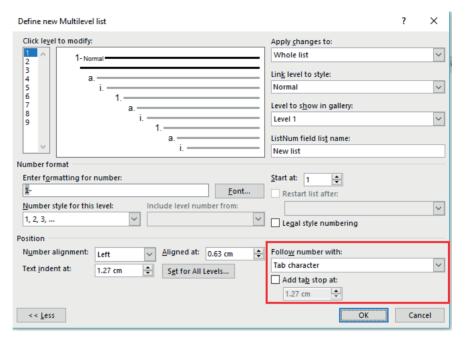
- Step 13: Select Legal Style Numbering to enforce a legal style on the multi-level list.
- **Step 14:** To change the number alignment, choose *Left*, *Centered* or *Right* under *Alignment*. Specify a value for where to start the alignment and a value for the text indent. To apply these values to the entire list, choose *Set for All Levels*.



... continued

TERM 2 | CHAPTER 4 PAGE AND DOCUMENT LAYOUT | UNIT 4.3 Paragraphs

Step 15: Enter a value for what should follow each number, *Tab character*, *Space*, or *Nothing*. Check *Add tab stop at* and enter a value.



Step 16: Select OK.

LINE SPACING

You may also need to customise your line spacing in the document, for example, adding a double-line space or a one-and-a-half-line space between each line of text.



Step 1: Select the text of which you want to change the line spacing.

At those words <u>Vortigern's</u> face grew white as ashes, and, rising in confusion and disorder, he sent for all the best artificers and craftsmen and mechanics, and commanded them vehemently to go and build him straightway in the furthest west of his lands a great and strong castle, where he might fly for refuge and escape the vengeance of his master's sons—"and, moreover," cried he, "let the work be done within a hundred days from now, or I will surely spare no life amongst you all."

Then all the host of craftsmen, fearing for their lives, found out a proper site whereon to build the tower, and eagerly began to lay in the foundations. But no sooner were the walls raised up above the ground than all their work was overwhelmed and broken down by night invisibly, no man perceiving how, or by whom, or what. And the same thing happening again, and yet again, all the workmen, full of terror, sought out the king, and threw themselves upon their faces before him, beseeching him to interfere and help them or to deliver them from their dreadful work.

... continued

Guided activity 4.10

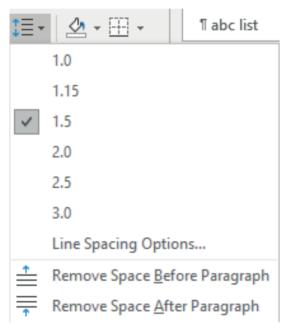
... continued

If you need to change the line spacing in the whole document, you can select all the text (use Ctrl+A on the keyboard) or change the line spacing in the *Normal* style.

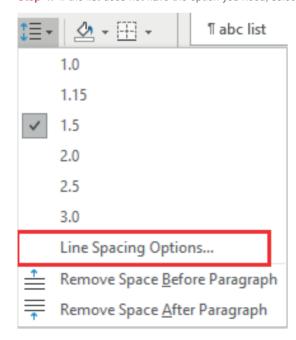
Step 2: Select the Line and Spacing icon in the Paragraph group on the Home tab.



Step 3: Choose a spacing option from the list.



Step 4: If the list does not have the option you need, select Line Spacing Options.



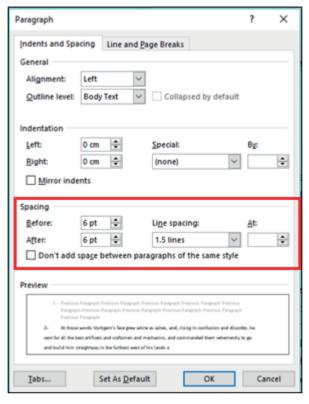
... continued

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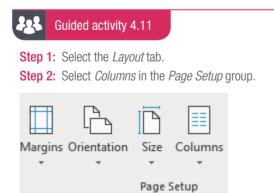
Step 5: In the *Paragraph* dialogue box, select the drop-down list under *Line Spacing* and then choose the option you want.



Step 6: Select OK.

COLUMNS

Columns are a way to format text to change the layout of a page filled with text. To insert columns, follow the steps in the example below. This feature can be set up before your document has text, or if the text is already typed, you need to select the text which should be placed in columns.



... continued

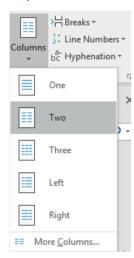
COMPUTER APPLICATIONS TECHNOLOGY | GRADE 11 | Practical Book

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Guided activity 4.11

... continued

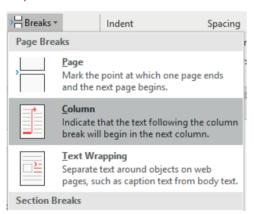
Step 3: Select the number of columns you want.



Step 4: To add a break between columns, place your cursor where you want to add the break and then select the arrow next to *Breaks*.

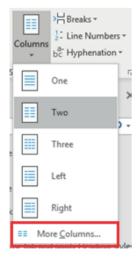


Step 5: Select Column.



This will move text to start at the top of a new column.

Step 6: To adjust the spacing between columns, select Columns and then select More Columns.



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... continued

TERM 2 | CHAPTER 4 PAGE AND DOCUMENT LAYOUT | UNIT 4.3 Paragraphs

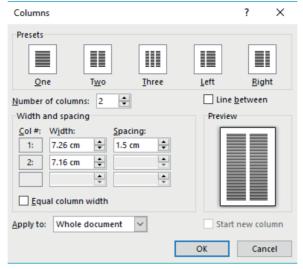
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Guided activity 4.11

... continued

Step 7: Use the up and down arrows to adjust the space between the columns and the width of the columns. To have columns of equal width, tick the *Equal column width* box.



Step 8: Check the box for *Line Between* if you need a vertical line to run between columns.

Step 9: Select OK.



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Activity 4.5

Complete the following activity on your own.

- 1. Apply numbering to text.
 - Open a blank Word document.
 - Open the document *Act4.5(Pollute)*, copy the text from "Pollution is the addition" to the first occurrence of "Soil Pollution" and paste it unformatted.
 - Select the text from the words "Air and Sound Pollution" to the words "Soil Pollution".
 - Apply the following numbering: Bold numbered list 1), 2), 3), with a left and right indentation of 0 cm, that hangs by 0,63 cm.
 - Save the document as *PolluteNumbering* and close the document.
- 2. Apply bulleting to text.
 - Open a blank Word document.
 - Open the document *Act4.4(Pollute)*, copy the text from "Water pollution is the introduction" to the first occurrence of "must be effectively controlled" and paste it unformatted.
 - Select the text from the words "Examples of Water Pollution" to the words "must be effectively controlled".
 - Apply the black square bulleting. Make sure the bulleting has a left and right indentation of 0 cm, that it hangs by 0,63 cm.
 - Then indent all the text under the words "Examples of Water Pollution" and above the words "Control Measures".
 - Also indent all the text below the words "Control Measures".
 - Further indent the paragraphs below the following words:
 - "Industrial Effluent"
 - "Mining and Agricultural Wastes"

... continued

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Activity 4.5

... continued

- "Sewage Disposal and Domestic Wastes"
- "The following measures can be used to stop water pollution:"
- The first bulleting level must have black square bullets.
- The second bulleting level must have black circle bullets.
- The third bulleting level must have arrows.
- Save the document as *PolluteBulleting* and close the document.
- 3. Change and apply a new multi-list levelling.
 - · Open a blank Word document.
 - Open *Act4.5(Fynbos)* and copy the text from "Twenty-six species of fynbos plants" to "Care for the Earth Day" unformatted.
 - Select the text from "The promotion of public" to "Care for the Earth Day" and do the following:
 - Apply a first level numbering style to the first three sentences (1 3).
 - \circ Apply a second level numbering style to the next three sentences (4-6).
 - \circ Apply a first level numbering style to the next two sentences (7-8).
 - Apply a second level numbering style to the next sentence (9).
 - Apply a third level numbering style to the next two sentences (10 11).
 - \circ Apply a fourth level numbering style to the remaining sentences (12 13).
 - The first level must be as follows:
 - Numbering style: 1, 2, 3; Times New Roman; Left; text indent: 0,63 cm; aligned at: 0 cm.
 - The second level must be as follows:
 - Numbering style: 1.1, 1.2, 1.3; Font: Times New Roman; Alignment: Left; Text indent: 0,63 cm; Aligned at: 0,63 cm.
 - The third level must be as follows:
 - Numbering style: a, b, c; Font: Times New Roman; Alignment: Left; Text indent: 0,63 cm; Aligned at: 1,1 cm; Font colour: Purple; Font style: Italic.
 - The fourth level must be as follows:
 - Numbering style: i, ii, iii; Font: Calibri; Alignment: Left; Text indent: 1 cm; Aligned at: 1,5 cm; Font style: All caps; Font size: 8 pt.
 - Save your document as *FynbosNumbering* and close the document.
- 4. Change line spacing.
 - Open a blank Word document.
 - Import the content from the document Act4.5(Ruga) unformatted.
 - Select all the text and change the line spacing as follows: Before: 0 pt; After: 12 pt; At least: 20 pt line spacing.
 - Change the spacing for the Normal style as follows: Before: 0 pt; After: 8 pt; Single line spacing.
 - Re-apply the Normal style to the text from "Bursting with eclectic multicultural" to "Venice Biennale in 2013."
 - Save the document as *RugaLineSpacing* and close the document.
- **5.** Change the line spacing of a new style.
 - Open a blank Word document.
 - Import the content from the document Act4.5(Ruga) with its original format.
 - Change the Thick Normal style's as follows: Before: Auto; After: 18 pt; Multiple line spacing
 of 1.5 cm.
 - Select the text from "Athi-Patra Ruga was" to "becoming a hybrid construct.".
 - Format the text as follows: Font colour: Red; Font size: 11 pt; Font style: Bold italic; Before: 2 pt; After: 2 pt; 1,5 lines spacing.

... continued



Activity 4.5

... continued

- Import the content from Global in its original formatting.
- Add a column break after the words "social, political and cultural positions".
- Add a next page section break before the words "Insert linked object".
- Save this new style as 'Small Red Thick'.
- Save the document as RugaLSpacing and close the document.

6. Insert columns.

- Open a blank Word document.
- · Create two columns.
- Import the content from Act4.5(Global) in its original formatting.
- Add a column break after the words "social, political and cultural positions".
- Add a next page section break before the words "Insert linked object".
- Select the text from the words "Travel tips & planning info" onwards and apply a threecolumn layout.
- Save the document as GlobalColumns and close the document.

Modifying columns.

- Open a blank Word document.
- Import the content from Act4.5(Global).
- Insert a page break after the words "Willie Bester, Athi-Patra Ruga and David Koloane."
- Insert a continuous section break after the words "to examine the process of art-making itself.".
- Select the text from the words "There are also a number of exiting" to "to examine the process of art-making itself." and do the following:
 - Apply the right column layout.
 - Change the line spacing of the text to 2.0 cm.
 - Change the column spacing as follows: Width of column 1: 9 cm; Spacing: 2 cm; add a line between the columns.
- Save the document as *GlobalModColumns* and close the document.

REVISION ACTIVITY

- 1. Open the *Chapter 4 Revision Activity 1* word processing document and do the following:
 - a. Apply any theme to the document and add a cover page with the text "Happy St Patrick's Day" as the title.(4)
 - **b.** Add your name in the author control. Add the date field in the format 01-Jan-17 anywhere on the page.
 - **c.** Add a header to the document. Insert the "Blank" header style. Change the header's font colour to red, bold and 14 pt. The header must contain the Filename.
 - d. Insert automatic page numbering at the bottom of the page as follows: (6)i. The first page must NOT be numbered.
 - ii. Odd pages must be right aligned and even pages left aligned to the footer.
 - **e.** In the sections "Common traditions include" and "Worldwide St. Patrick's Day Parades and Celebrations" make the text a bullet list.
 - **f.** Under "Common traditions include" add a second level to the first bullet listing the cities that hold large parades.
 - g. Add a section break between "The History of St. Patrick's Day and why it's celebrated" and "Worldwide St. Patrick's Day Parades and Celebrations". (1)
 - h. Take the text under "The History of St. Patrick's Day and why it's celebrated" and convert it to two columns with a line between. Set the width of the columns to 6.5 cm. (4) Save and close the document.

... continued

(4)

(6)

(2)

(2)

REV	VISION ACTIVITY	continued
2.1	en the <i>Chapter 4_Revision Activity 2</i> word processing document. I. Format the first two paragraphs in the document as follows: a. Change the line spacing of the first paragraph in the document to Double. b. Indent the FIRST line of the second paragraph to 2 cm. Change all the paragraphs of the document to a bulleted list. Apply bullets as for a. Insert the 4Gold image as a bullet. b. Align the bullet 0.5 cm from the margin. c. Set the text indent at 2 cm.	(1) (1) bllows: (2) (1) (1) TOTAL: [35]

AT THE END OF THE CHAPTER

	CAN YOU	YES	NO
1	Use the different themes in a word processor?		
2	Insert a cover page in a word processor?		
3	Insert section breaks and sections?		
4	Insert multi-level lists?		
5	Use line spacing in paragraphs?		

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CHAPTER 5

ELECTRONIC FORMS AND ONLINE/OFFLINE HELP

CHAPTER OVERVIEW

Unit 5.1: Electronic forms

Unit 5.2: Online/offline help

By the end of this chapter, you will be able to:



- Create and manage fillable electronic forms.
- Troubleshoot common Microsoft Word problems and access the Help functions.

INTRODUCTION

In this section you will learn to create forms in word prcessing documents that allows users to fill in certain fields. You will also find out how to solve common word prcessing problems.

Questionnaires are powerful instruments to gather information from people. Questionnaires are emailed to respondents to fill in electronically. MS Word allows you to include text boxes, dropdown lists, checkboxes and other form field controls in your document.

The forms can also be printed if necessary.

5.1 Electronic forms

You can create electronic forms in Microsoft Word for a variety of uses. These forms are basically a word processing document with special properties that allow users to fill in certain fields with information or to answer questions. You can prevent users from making changes to the document and only using the fields you create by protecting the document.

To create a form, you first need to make sure that you can access the tools necessary to create the fields in the form. You will need to enable the *Developer* Tab on the Ribbon:

- Select File.
- Select Options.
- Select Customize Ribbon.

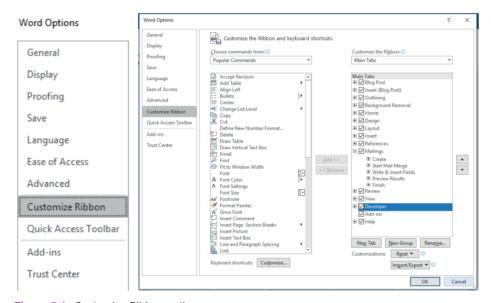


Figure 5.1: Customize Ribbon option

• Tick the box next to Developer.

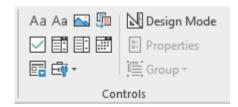


Step 1: Write the content you need.

Step 2: Select the Developer tab.



Step 3: Select Legacy tools in the Controls group.

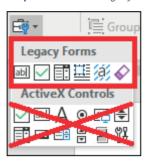


... continued

TERM 2 | CHAPTER 5 ELECTRONIC FORMS AND ONLINE/OFFLINE HELP | UNIT 5.1 Electronic forms

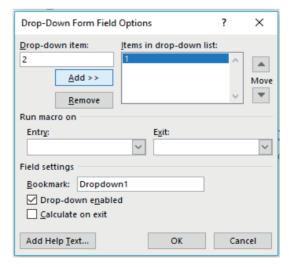
Step 4: Place your cursor in the document where you want to insert a form field.

Step 5: Select the Legacy Tools icon to access the control fields you will be using.



ICON	NAME	DESCRIPTION
Form field types		
abl	Text Form Field	Used for text. Only the field can be formatted, not the text inside the field.
<u>~</u>	Check Box Form Field	Creates an on/off check box.
	Drop-Down Form Field Displays a list you specify. Users cannot add town entries.	
Form field tools		
<u> </u>	Insert Frame	Creates a frame. Frames hold static content.
(á)	Form Field Shading Switches form field shading on or off. Reset Form Fields Clears all the entries in fields	
<		

Step 6: Select *Properties* to add content to your fields. In this example, we are adding numbers to a drop-down list.



Here we have added 1 and typed 2 into the *Drop-down item* box. Select *Add* to add it to the list and then select *OK*.

... continued



Step 7: Use the *Restrict Editing* tool in the *Protect* group to limit what people can change in the document.

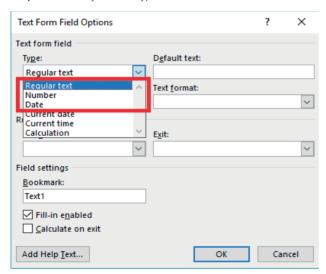


You can stop people from changing styles or make changes at all, other than just filling in the form fields. Once you have set what other users can do in the document, select Yes, Start Enforcing Protection, give the document a password and then select OK.

You can also customise form fields by using the form fields' properties and by configuring them correctly. This means that you can use a text field to insert dates, numbers or text with special formatting. Legacy form fields have a variety of configuration options available.

Guided activity 5.2

- **Step 1:** Insert a *Text form field*.
- **Step 2:** Right-click on the form field or select *Properties* in the *Developer* tab to open the *Properties* dialogue box.
- Step 3: Choose your field type:



Step 4: Enter your properties in the fields and then select OK.



Giving the document a password to be opened with, is optional.

TERM 2 | CHAPTER 5 ELECTRONIC FORMS AND ONLINE/OFFLINE HELP | UNIT 5.1 Electronic forms

If you choose Regular text, the following options are available:

- Default text, which lets you specify the text that appears in the field before the user enters their own text.
- Maximum length allows you to restrict the number of letters in the field.
- *Text format* lets you specify if the text in the field to be uppercase or lowercase only or if the text should start with a capital letter or be in title case.

If you choose *Number*, you will have the following options:

- Default number, which lets you specify the number that appears in the field before the user enters their own.
- Maximum length is measured in the number of digits you specify.
- *Number format* is a drop-down list that lets you choose a specific number format, like currency or percent.

If you choose Date, you get the following options:

- Default date works just like Default text.
- Maximum length lets you specify the number of digits in a date. You don't really need
 to specify this, as dates can only be a certain length anyway.
- The Date format drop-down list lets you specify the date format (for example dd-MMyyyy or yyyy-MM-dd).
 - dd for the day i.e. dd for 05, ddd for Mon, dddd for Monday
 - MM for the month i.e. MM for 12, MMM for Dec, MMMM for December
 - yyyy for the year i.e. yy for 19, yyyy for 2019

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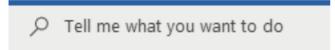
5.2 Online/Offline help

When you run into problems using Microsoft Word, you can turn to the built-in Help function or look online for help for your issues. Note that Microsoft's help function is not available offline in newer versions from 2016, onward.

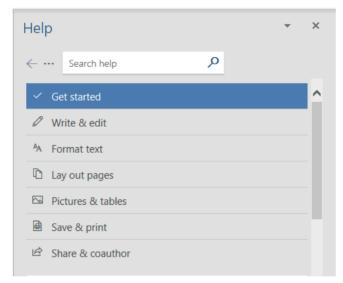


To access the built-in *Help* function, you can:

Step 1: Enter a query in the box labelled *Tell me what you want to do* at the end of the tabs at the top of the document.



Step 2: Press F1 on your keyboard to enter the *Help* panel on the right-hand side of the document.



Step 3: Select *File* and then select the "?" in the top right-hand corner.



You can also go online and search for your problem. Usually, your top results will be the Microsoft support website, where you will be able to find tutorials for Microsoft products as well as answers to frequently asked questions.



TERM 2 | CHAPTER 5 ELECTRONIC FORMS AND ONLINE/OFFLINE HELP | UNIT 5.2 Online/Offline help



Activity 5.1

First Name:

- 1. Create a form.
 - a. Open a blank document.
 - **b.** Add the following fields:
 - Add a first name field. Add form field shading.
 - Add a surname field. Limit this field to 20 characters and add form field shading.
 - Add a date field. Use the YYYY/MM/DD format and add form field shading.
 - c. Create FIVE yes or no questions and add a check box at the end of these questions.
 - **d.** Create THREE questions with a limited amount of possible answers. Hint: Use the drop-down list.
 - e. Add a simple signature line at the bottom.
 - f. When you are done, add a password of 123 to restrict editing.
 - g. Save the document as Act5.1_Q1(YourName) and close the document.

Surname:	
Date:	
Questions:	
 Are you South African citizen? Do you have a smart ID? Do you have a valid passport? Do you have a valid driver's license? Were you ever convicted of a crime? 	
6. Which province do you stay?7. Which language do you prefer?8. Which mobile service provider do you prefer?	prefer?

- 2. Edit a form.
 - a. Open a blank Word document.
 - **b.** Open the *Act5.1(School)* document and copy and paste the 'Electricity Usage: Survey Form' on the last page, with its original formatting.
 - **c.** Change the Name field to a drop-down list field. Create THREE possible name options, but one of them should be your real name.
 - **d.** Change the Surname field to a drop-down list field. Create THREE possible surname options, but one of them should be your real surname.
 - e. Change the Age field to a Number text field.
 - f. Restrict the Age field to THREE characters.
 - **g.** Add a date field that does not update automatically.
 - h. Add the following extra fields:
 - i. Add an ID number text field. Restrict the field to 10 characters.
 - ii. Add a Gender check box field.
 - i. After the "How would you describe your usage of electricity?" question, insert a Frame around the blue highlighted text, expand the frame and position it under the question.
 - j. When you are done, add a password of 123 to restrict editing.
 - **k.** Save Act5.1_Q2(YourName) and close the document.

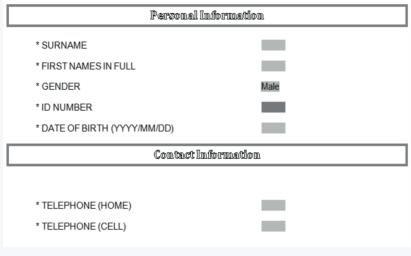
Complete the following in your notebook:

- **3.** When you use the online help function, what are the first TWO results that appear for: (Note: You will need an internet connection to use this.)
 - A Background colour B Forms C Break D Data tool

REVISION ACTIVITY

1. A draft version of the electronic entry form for learners who would like to attend workshops has been created.

Open the Chapter 5_Revision Activity 1 word processing document.



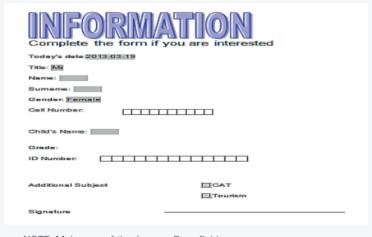
The form uses legacy form controls. Some form field controls have been added to the form already.

Change the form as follows:

- **a.** Set and apply appropriate tabs to align the form controls and the labels under the headings "Personal Information" and "Contact Information" as follows:
 - The first tab is set at 1 cm. (2)
 - The second tab is set at 11 cm. (2)
- b. Add the items "Male" and "Female" to the drop-down form field next to the word "GENDER".(2)
- c. Add an appropriate form field control next to the text "ID NUMBER". This field should only accept 13 characters.(2)
- **d.** Format the text form field control next to the text "DATE OF BIRTH" to allow only dates with the format yyyy/MM/dd.
- e. Add a control next to the text "WEDNESDAY" that will be similar to the one above it in the form.(1)

NOTE: Do NOT lock or protect the form

- 2. Open the Chapter 5_Revision Activity 2 word processing document.
 - a. Format the electronic form at the end of the document to appear as follows:



NOTE: Make use of the *Legacy Form* fields.

... continued

TERM 2 | CHAPTER 5 ELECTRONIC FORMS AND ONLINE/OFFLINE HELP | UNIT 5.2 Online/Offline help

(2)

RE\	VISION ACTIVITY o	ontinued
b	Switch on the Form Field Shading function of the application.	(2)
C.	Add a Drop-down Form Field to the right of the word "Title" with the following options	
	Mr, Mrs, Ms and Dr.	(2)
d.	Add Check Box Form Fields to the left of the words "CAT" and "Tourism".	(2)
e.	Format the Text Form Field next to the heading "Today's date" as follows:	
	change the Type to Current date, and the	
	• format to yyyy-MM-dd.	(2)
f.	Change the property of the Text Form Field for "Child's Name" so that the name will	
	automatically appear in uppercase when the user enters a name in the field.	(1)
a.	Insert a table for the ID number next to the heading "ID Number". The table must have	. ,
3	13 columns and one row, and the columns must be 0.5 cm wide.	(3)
h.	Add a leader tab next to the word "Signature". The leader tab must start at 6 cm and	(-)
	end at 14 cm. Use a solid line for the leader tab.	(2)
i.	Place a 3pt wide double-line page border around the page.	(3)
ï	Add your name to the author property of the document.	(2)
J.	ve and close the document	(८)
Od	ve and dose the document	
	TOTAL	.: [30]

AT THE END OF THE CHAPTER

	CAN YOU	YES	NO
1	Create a form in a word processor?		
2	Add a drop-down form field?		
3	Change the default value of checkboxes?		
4	Use online/offline help in a word processor?		

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STYLES



CHAPTER OVERVIEW

Unit 6.1: Editing or creating styles



By the end of this chapter, you will be able to:

- Describe the difference between templates and styles.
- Edit or change a style.
- Create a new style.
- Apply heading and paragraph styles.

INTRODUCTION

Styles are an easy way to quickly and consistently add formatting to Word documents. In this chapter you will learn about styles and how to create your own styles. You will also learn how to edit existing styles.

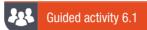
TERMS 1, 2, 3 | CHAPTER 6 STYLES

6.1 Editing or creating styles

In Grade 10, you learned about the *Quick Style* gallery. The *Quick Style* gallery is the easiest way to apply a style. You can find it on the Home tab in the Styles group. You can apply any style in the Quick Style gallery by selecting one of the styles. You can also see more styles by selecting the down arrow on the bottom-right corner.

You can hover the mouse pointer over a style to see what it will look like in the document without having to select it.

You can also edit specific styles to suit your document. This can include changing the spacing, numbering and font colour and size depending on what you want to do.

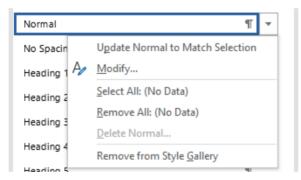


Step 1: Open a blank word processing document. Select the arrow in the bottom right corner of the Styles group on the *Home* tab.

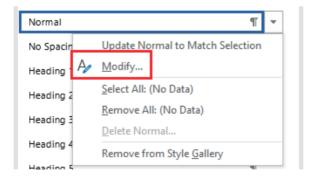


This opens the Styles pane.

Step 2: Select the down arrow next to the name of the style you want to change.



Step 3: Select Modify.





- 1. Open Act6.1(Pollute).docx.
 - **a.** Edit the style "Heading 1" as follows:
 - i. Format the font to all caps.
 - ii. Make the text bold.
 - iii. Change the font to Arial, 16pt.

... continued



- **b.** Edit the style "Heading 2" as follows:
 - i. Change the font to Arial, 14pt.
 - ii. Make the text bold and underlined.
 - iii. Format the text to be green.
- **c.** Edit the style "Heading 3" as follows:
 - i. Format the text to be blue.
 - ii. Make the font Arial, 11pt and bold.
- d. Edit the style "Normal" as follows:
 - i. Make the text Arial, 11pt.

You can change font type, size and colour of the style as well as changing the alignment, line and before/after spacing and the indentation. Selecting *Format* in the bottom left-hand corner also gives you the option to change the paragraph layout, add or remove tabs, borders, frames, numbering and text effects. You can also change the default proofing language or create a shortcut key.

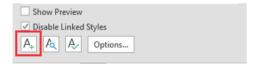
While the *Quick Styles* gallery and the styles are wonderful tools, you may want to create your own styles for your document, depending on your needs.



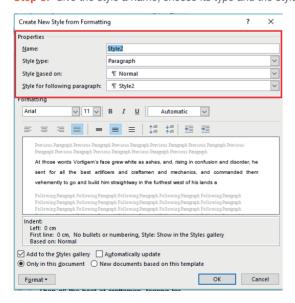
Step 1: Select the arrow in the bottom right corner of the Styles group on the Home tab.



Step 2: Select New Style in the bottom left corner of the style pane.



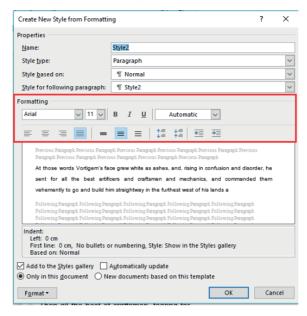
Step 3: Give the style a name, choose its type and the style it is based on.



... continued

TERMS 1, 2, 3 | CHAPTER 6 STYLES | UNIT 6.1 Editing or creating styles

Step 4: Choose the font type, size and colour for the new style.



Step 5: Choose an alignment, line spacing and indents.

APPLYING HEADING AND PARAGRAPH STYLES

Once you have created the styles, you can apply them to headings and paragraphs. Heading styles are particularly important, since the headings need to be formatted to a specific Heading style for you to make a table of contents or an index.



Step 1: Select the text you want to apply a style to.

Introduction

In this chapter you will learn about how to apply themes and add sections, section breaks, headers and footers and cover pages to your Word documents. You will also learn how to customise bullets, numbering and spacing in paragraphs and how to create new multi-level lists.

Step 2: In the *Styles* group, select the heading or paragraph style in the *Styles* gallery you want to apply.



Step 3: Check that the style has been applied correctly.

Introduction

In this chapter you will learn about how to apply themes and add sections, section breaks, headers and footers and cover pages to your Word documents. You will also learn how to customise bullets, numbering and spacing in paragraphs and how to create new multi-level lists.

2

Activity 6.2

- 1. Open Act6.2(Pollution).docx. Create a new style as follows:
 - a. Base the style on "Heading 1".
 - **b.** Centre the text horizontally.
 - **c.** Apply any type of paragraph border.
 - d. Apply the new style to the heading in the document.

REVISION ACTIVITY

- Open the *Chapter 6_Revision Activity* word processing document and do the following:
 Type your name and surname in the document subtitle of the cover page. Change the font colour to dark blue.
 - **1.2** Apply a double line 2pt page border that does not include the first page. (3)
 - **1.3** Create new styles for the following headings. Use different font styles/sizes, colours, effects and spacing.
 - **a.** Create a style for a Heading 1 and apply it to all text marked with h1. (4)
 - **b.** Create a style for Heading 2 and apply it to all text marked h2. The style must be visually different from the Heading 1 style.
 - **c.** Create a style for Heading 3 and apply it to all text marked h3. The style must be visually different from both the Heading 1 and Heading 2 styles. (4)
 - **d.** Modify the Normal style as follows:
 - i. Change the font to Arial and the font size to 12pt.
 - ii. Change the spacing before and after to 3pt. (2)
 - iii. Make the line spacing Multiple at 1.15. (2)
 - **1.4** Change the height of the picture on page 2 to exactly 5cm and apply any art border of your choice.
 - **1.5** Use a formula to calculate the total of the Precious Metals Production 2015 in the space provided on the table on page 2. (3)

Total: [30]

(3)

(4)

(2)

(3)

AT THE END OF THE CHAPTER

	CAN YOU	YES	NO
1	Describe the difference between templates and styles?		
2	Edit or change a style?		
3	Create a new style?		
4	Apply heading and paragraph styles?		



CHAPTER 7

MAILINGS AND REFERENCES

CHAPTER OVERVIEW

ne

Unit 7.1: Mailings

Unit 7.2: Reference

By the end of this chapter, you will be able to:



- Use Mail Merge for letters and labels.
- Use the referencing features to add captions, footnotes, citations, bibliographies, indexes and tables of contents.

INTRODUCTION

In this chapter you will learn about how to do a mail merge to create personalised letters and labels. Lastly, you will learn about the referencing tools in Word and how to use them. These tools include:

- Captions
- Footnotes
- Citations and bibliographies
- Tables of contents

7.1 Mailings

The Mail Merge feature in Word helps you create personalised written communication more efficiently. You can create batches of personalised letters and emails that can include standard and customised content. All the data you use to customise communications is taken from a data source (a mailing list saved in Excel, Word or Access for example). You can also create and print personalised envelopes and mailing labels using Mail Merge.

The Mail Merge process uses three documents:

- The main document that contains images, text, etc. that are the same for each letter, email, envelope or label.
- The mailing list, which contains the data that is used to fill in information in the main document.
- The merged document, which is a combination of the main document and the mailing list.

In this section, you will learn how to create a Mail Merge for letters and labels.

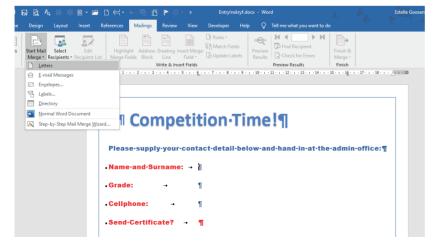
MAIL MERGE LETTERS

You can use Mail Merge to create fully customisable letters that have the same layout, formatting, text and graphics, but also have specific sections that vary and are personalised. Mail Merge will use data from a data source, like an Excel spreadsheet, to customise the sections in the letter.

Before you start the Mail Merge, make sure that the mailing list is complete and up to date. If you are using an Excel spreadsheet for the data, make sure you format the cells that contain postal codes and telephone numbers as text so that you do not lose any leading zeroes.

Guided activity 7.1

- 1. Open a blank document or an existing document. Use EntryInskryf.docx for this activity.
- 2. Open the *Mailings* tab, choose *Start Mail Merge* and then *Letters*.

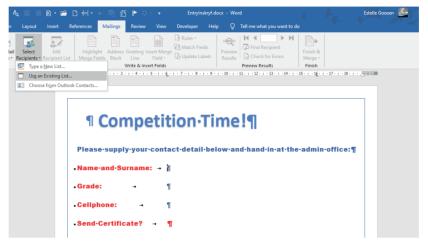


... continued

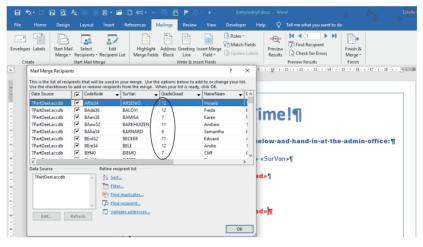
TERM 3 | CHAPTER 7 MAILINGS AND REFERENCES | UNIT 7.1 Mailings



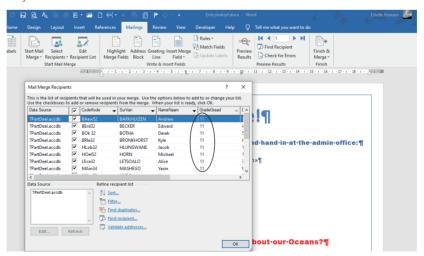
3. Select *Recipients*, *Use an Existing List*. Recipient lists can be created in a word processing table or spreadsheet. Select the spreadsheet *DetailBesond* to merge the documents in this activity.



4. Choose *Edit Recipients List*. Use any of the methods (sort, filter, etc) to edit the list. Or untick those recipients who should not receive the letter. In this case filter the list to show only Grade 11.

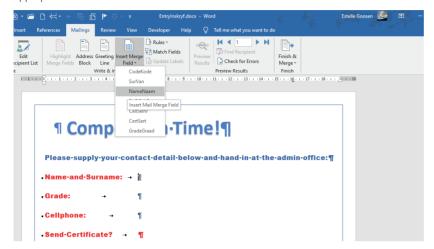


Only the Grade 11 learners will receive the letter.

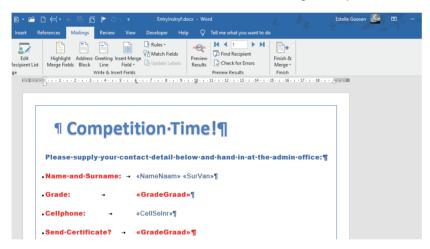


... continued

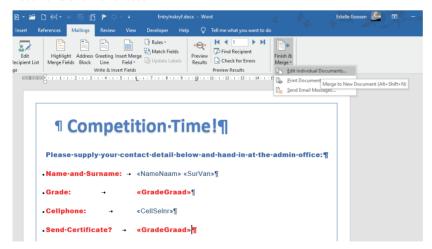
5. Click next to *Name and Surname* in the document and choose *Insert Merge Field*. Choose the appropriate field from the list. Do this for all the fields.



This is what the inserted fields would look like before the merge is completed.



6. The most important step is to complete the merge. Choose *Finish & Merge*, *Edit Individual Documents* and then choose *All*.

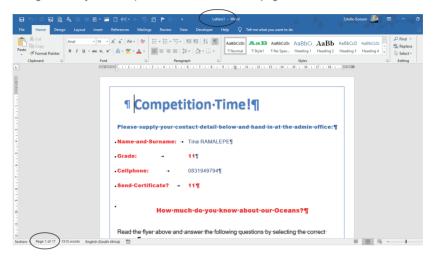


... continued

TERM 3 | CHAPTER 7 MAILINGS AND REFERENCES | UNIT 7.1 Mailings

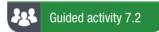


7. After the merge has been completed, a new document is created containing personalised letters to each of the recipients in the list. Note the name of the new document (which should be changed when you save it) as well as the number of pages at the bottom of the screen.

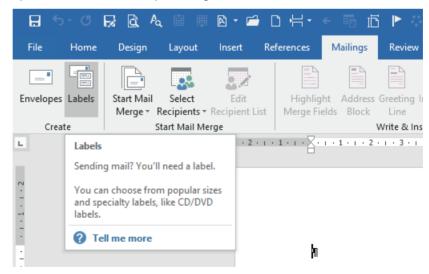


MAIL MERGE LABELS

You can create personalised mailing labels using the mailing list. It is always a good idea to use the built-in label templates before you start the mail merge.



1. Open a blank document and open Mailings. Choose Labels.

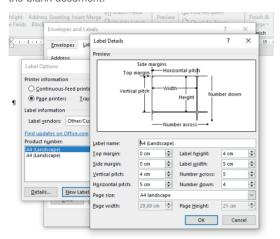


... continued

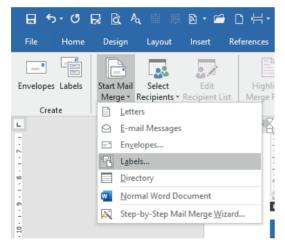
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... continued

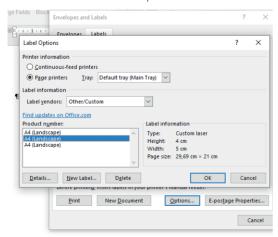
2. Choose New label and enter the measurements as indicated. Save the new label. Do not close the blank document.



3. Open Start Mail Merge and choose Labels.



4. Choose the label saved in Step 2. Click on *OK*.



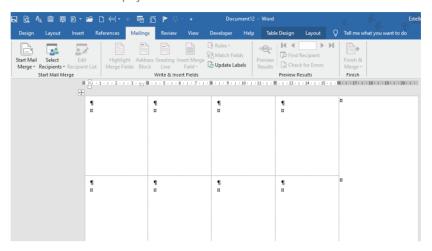
... continued

Note

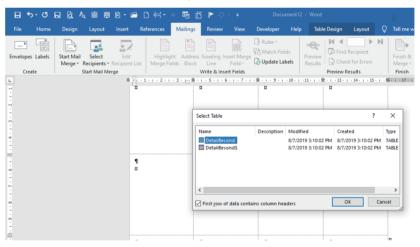
It is possible to create a customised label by clicking on New Label.

TERM 3 | CHAPTER 7 MAILINGS AND REFERENCES | UNIT 7.1 Mailings

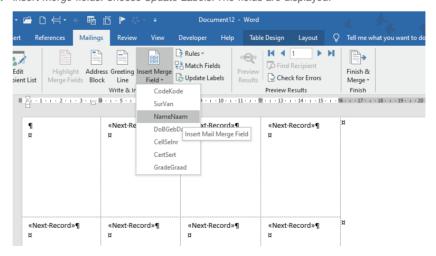
The blank labels are displayed as indicated below:



5. Choose *Select Recipients, Use an Existing List*. Use the same spreadsheet (*DetailBesond.xlsx*) you used for the previous Guided Activity. Select the list from the spreadsheet.

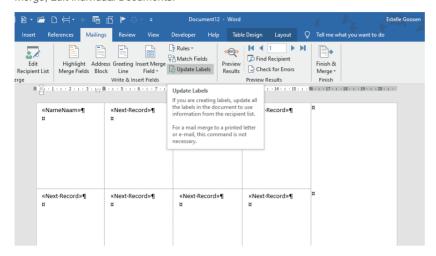


6. Insert Merge fields. Choose Update Labels. The fields are displayed.



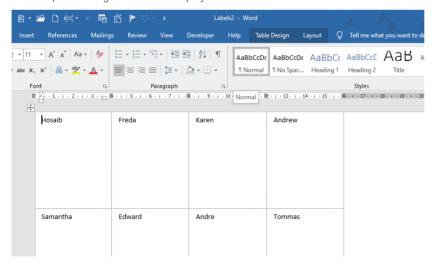
... continued

7. In the same way as previously explained, the merge has to be completed. Choose *Finish & Merge, Edit Individual Documents*.





The completed merged labels are displayed.



Save and close the document.

Note that the wizard can also be used to create envelopes for individually addressed recipients.



Activity 7.1

- **1.** Open *Act7.1(Letter).docx* and prepare a letter mail merge as follows:
 - **a.** Use the spreadsheet *Act7.1(Letter).xlsx* as the data source.
 - **b.** Use the *More items* option to add a name and an address to the letter.
 - **c.** Complete the merge and save the new merged document as *Act7.1(Merged_letter).docx*.
- **2.** Open *Act7.1(Letter).docx* and prepare a label mail merge as follows:
 - **a.** Use the spreadsheet *Act7.1(Letter).xlsx* as the data source.
 - **b.** Add the merge field Address block.
 - **c.** Complete the merge and save the new merged document as *Act7.(Merged_labels).docx.*

UNIT

7.2 References

When you are creating assignments for school or university, you will need to use references to show that you are not committing plagiarism. (This means stealing someone else's work.) You will also need to add captions to the images and tables and create a table of contents.

In this section, you will learn how to insert captions, footnotes, citations, bibliographies, and content tables.

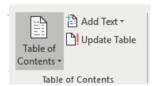
TABLE OF CONTENT

A table of contents helps the reader to navigate a document easily. The table of contents is used to reference where in the book a particular heading or topic is to move to that page. If the document is viewed electronically, click on the heading in the table of content and navigate straight to the relevant page.

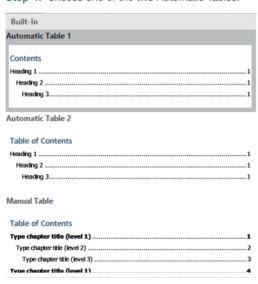
Tables of contents are usually found at the start of a document after the title or cover page. It is easiest to add them after you have written and formatted the document.

Guided activity 7.3

- **Step 1:** Ensure that all the headings have been formatted to specific Word styles, under the *Home* tab, Styles.
- Step 2: Start on a blank page after the cover page.
- Step 3: Select Table of Contents in the Table of Contents group in the References ribbon.



Step 4: Choose one of the two Automatic Tables.



Word will take all the items you have formatted into headings and add them to the table. If anything changes, you can simply click anywhere in the table and then select *Update Table*.



Something to know

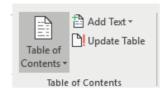
You will not be able to insert a table of contents if you have not applied heading styles to the headings.

TERM 3 | CHAPTER 7 MAILINGS AND REFERENCES | UNIT 7.2 References

You can also create a custom table of contents where you can set how many levels of headings you want to show, what Tab leader you want to use and even what style and fonts you would like to use.



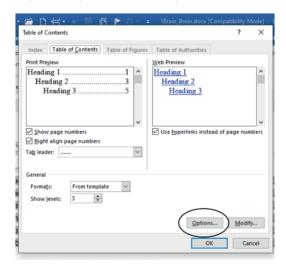
- **Step 1:** Start on a blank page after the cover page.
- **Step 2:** Select *Table of Contents* in the *Table of Contents* group in the *References* ribbon.



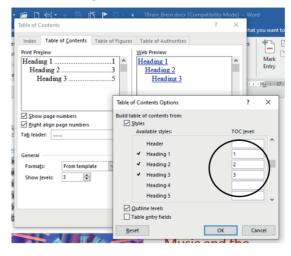
Step 3: Select Custom Table of Contents.



Step 4: To adjust the levels displayed in the Table of Contents, open *Options*:



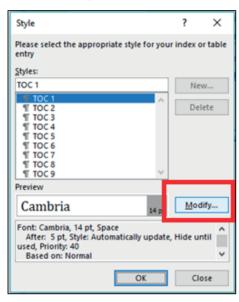
Delete the heading that is not needed. Click on OK and OK again to apply the setting.



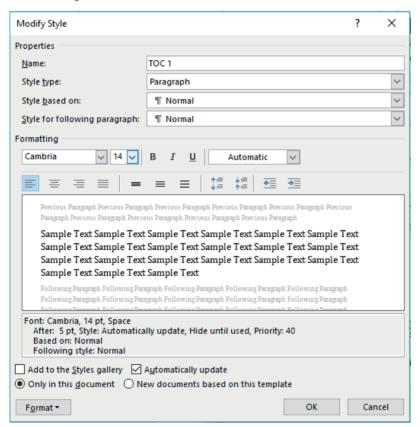
... continued

... continued

Step 5: To change the font and font size, select *Modify* and then select *Modify* again.



Step 6: Change the font and font size. Select *OK*, then select *OK* again. Select *OK* in the main dialogue box.



... continued

... continued

Step 7: The table of contents is complete and should look like this.

Chapter 3: Mailings and references	1
Introduction	1
Unit 3.1 Mailings	1
[ACT] Activity 3.1: Practical activity	8
Unit 3.2: References	10
Table of contents	10
[ACT] Activity 3.1: Practical activity	13
Table of figures	13
Footnotes	14
[ACT] Activity 3.2: Practical activity	16
Captions	16
[ACT] Activity 3.3: Practical activity	18
Citations	18
[ACT] Activity 3.4: Practical activity	21
Bibliography	21
[ACT] Activity 3.5: Practical activity	22
Index	22
[ACT] Activity 3.6: Practical activity	24
Revision activity	24



Activity 7.2

- 1. Open Act7.2(Pangolins).docx.
 - **a.** Insert a table of contents after the cover page.
 - **b.** Use the default style.
 - c. Show two levels of headings.

Save document as Act7.2(TOC) and close the document.

TABLE OF FIGURES

A table of figures is a list of the figures in a document along with the page number of the page they are on. A table of figures is a quick reference of the captioned items in a document.



Something to know

You cannot create a table of

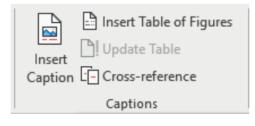
figures before you have added captions to all the

tables or figures in

the document.

Guided activity 7.5

- **Step 1:** Start on a blank page after the table of contents page.
- **Step 2:** Select *Insert Table of Figures* in the *Caption* group in the *References* ribbon.



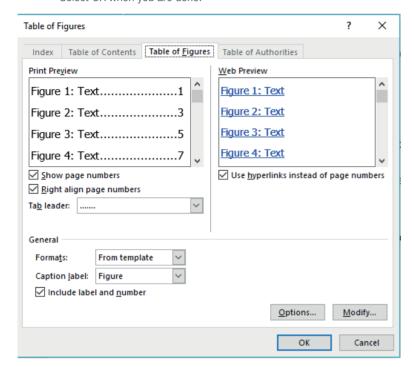
... continued

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... continued

Step 3: Make any changes you need to make in the *Table of Figures* dialogue box that opens. Select *OK* when you are done.



FOOTNOTES

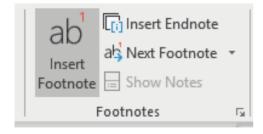
Footnotes are useful for including more information or an explanation of the text without adding more text to the main body of the document. Footnotes appear as smaller text in the Footer section of the page and are labelled with a number or letter in the body of the text. Inserting footnotes is very simple.

A footnote consists of two parts.

- 1. The number format or symbol used to indicate that there is a footnote.
- 2. The footnote's text at the bottom of the page or below the text.

Guided activity 7.6

- **Step 1:** Place the mouse cursor in the text where you want to put the footnote label.
- **Step 2:** Select *Insert Footnote* in the *Footnotes* group in the *References* ribbon.



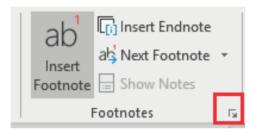
... continued

Step 3: Type the footnote in the space that is created at the bottom of the page.

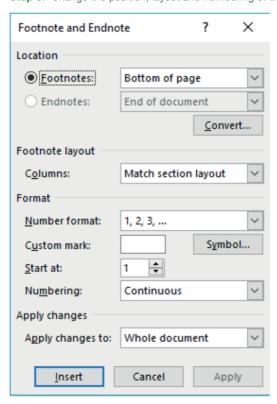
When he had in vain consulted many craftsmen and builders, he sent, by the advice of the archbishop, for Merlin, and asked him what to do. "If you would honour the burying-place of these men," said Merlin, "with an everlasting monument, send for the Giants' Dance which is in <u>Killaraus</u>1, a mountain in Ireland; for there is a structure of stone there which none of this age could raise without a perfect knowledge of the arts. They are stones of a vast size and wondrous nature, and if they can be placed here as they are there, round this spot of ground, they will stand for ever."

At these words of Merlin, Aurelius burst into laughter, and said, "How is it possible to remove such vast stones from so great a distance, as if Britain, also, had no stones fit for the work?"

Step 4: To format or customise the footnotes, select the arrow in the bottom right of the *Footnotes* group.



Step 5: Change the position, layout and numbering of the footnotes.



Step 6: Select *Insert* when you are done.

¹ Mount <u>Killaraus</u> is a legendary mountain in Ireland, most famous for being the source of the stones of Stonehenge in Arthurian legend.



Activity 7.3

- 1. Open Act7.3(Pangolins).docx.
 - a. Find the text "Philidota" under heading 1 "Introduction".
 - **b.** Insert a footnote on the text as follows:
 - The footnote must be on the same page as the text.
 - Use the letter "a", as the footnote symbol.
 - Add the text "From the Greek word pholis, meaning horny scale" as the footnote text.

Save document as Act7.3(Footnote) and close the document.

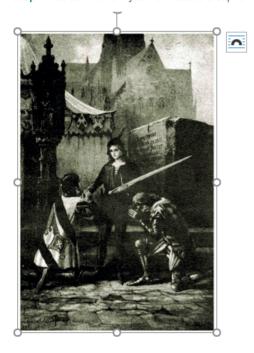
CAPTIONS

Captions are labels that provide an explanation of an image, equation, object or table. They are numbered, so that a reader can refer to them in the text and so that a list of figures or tables can be created without retyping figure names and numbers. MS Word's captions are automatically numbered, so you do not need to remember which item you are numbering. Each time that you add a new caption the other numbers will update.

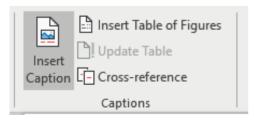


Guided activity 7.7

Step 1: Select the item you want to add a caption to. In this case, it is an image.



Step 2: Select *Insert caption* in the *Captions* group on the *References* ribbon. (You can also use a right-click on the mouse.)



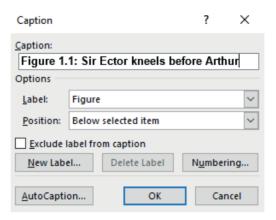
... continued

TERM 3 | CHAPTER 7 MAILINGS AND REFERENCES | UNIT 7.2 References

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Step 3: Type in the label you want for the image after the figure number.



Step 4: Make sure that the *Label* is *Figure* and that the *Position is Below selected item*.

Step 5: Select *OK* and then select *OK* again.



Figure 7.1: Sir Ector kneeling before Arthur

You can also change *Figure* to something else if you need to. The labels can be *Table or Equation*, or you can create your own under *new label*. You will use the same process in the example above to add captions to tables and equations. Table captions are usually above the table and equation captions are usually below the equation.



- 1. Open Act7.4(Pangolins).docx.
 - **a.** Add captions to the four images in the text as follows:
 - Images must use the label Figure and have a number (for example, Figure 5).
 - **b.** Add a table of figures after the table of contents

Save the document as Act7.4(Captions) and close the document.

CITATIONS

Using references or citations when creating reports, essays or other academic work can seem intimidating, especially if you have never used them before. For most people, their first experience with citing sources only comes during tertiary education, where the consequences for not citing correctly can be very severe.

Luckily, Microsoft Word has a Citation feature that helps you insert references and citations from a variety of academic referencing styles with a minimal amount of errors.

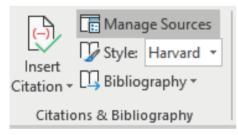
Before you can insert citations, you will need to build a list of sources. You can do this for several different types of sources, including:

- Books and book sections
- Journal and periodical (magazines, etc.) articles
- Conference proceedings
- Reports
- Websites and documents from websites
- Electronic sources
- · Artwork, recordings, films and performances
- Interviews, patents and cases
- Miscellaneous sources

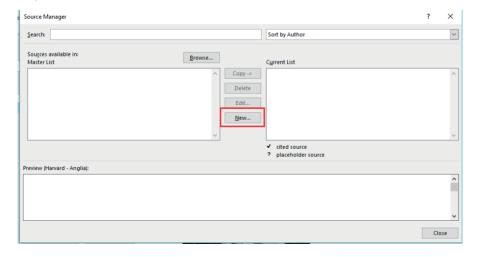
The required fields will change depending on the source you choose.

Guided activity 7.8

Step 1: Select *Manage Sources* in the *Citations & Bibliography* group in the *References* tab.



Step 2: Select New.

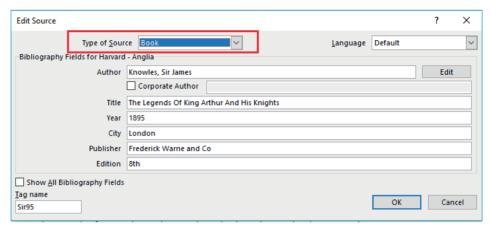


... continued

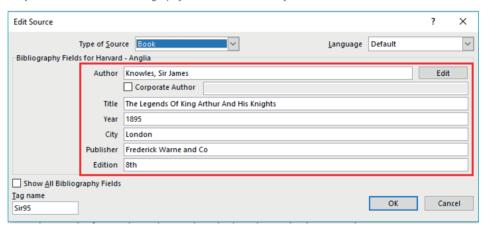
TERM 3 | CHAPTER 7 MAILINGS AND REFERENCES | UNIT 7.2 References

... continued

Step 3: Select the *Type of Source* from the drop-down menu.



- Step 4: Fill in the details for the source.
- Step 5: Check Show All Bibliography Fields if some fields you need are not shown.



Step 6: Select OK.

Word will insert the source in the text as well as store it for use in the bibliography.

Once you have added all the sources to the list, you can insert citations at the end of a paragraph or sentence as a source.



- Step 1: Place the mouse cursor in the text where you want to place the citation.
- **Step 2:** In the *Citations & Bibliography* group in the *References* ribbon, select *Insert Citation*.



... continued

Something to know

Some of the fields will change depending on the referencing style you choose. In this case, the fields are for the Harvard referencing style.

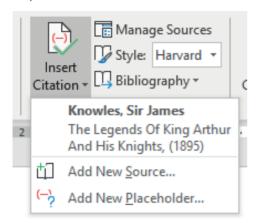


Something to know

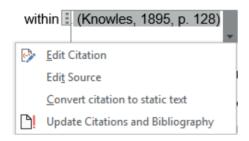
Harvard and APA are the two most common referencing systems at South African universities, and they are the ones you will most likely use. Harvard and APA are very similar in style, but they do have some differences.

... continued

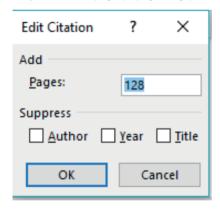
Step 3: Choose the source from the list.



Step 4: To add page numbers to the in-text citation, select the down arrow in the citation field and select *Edit Citation*.



Step 5: Add the page (or page range) number in the box and select OK.



Activity 7.5

- 1. Open Act7.5(Pangolins).docx.
 - **a.** Add any five items found under the References heading (at the end of the document) as sources.
 - Make sure that you use the correct format for each source (indicated in bold and square brackets next to each source).
 - Sources must use the Harvard referencing style.
 - **b.** Find the placeholders in the text for each source and add an in-text citation.

Save the document as Act7.5(Sources) and close the document.

BIBLIOGRAPHY

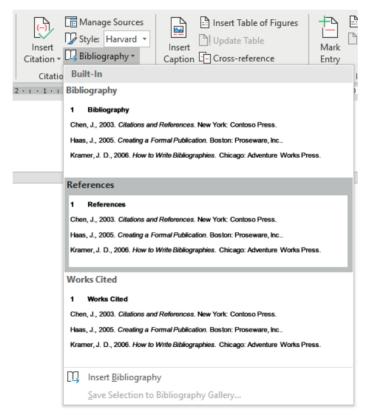
To insert a bibliography at the end of the document, follow the steps in the example below.



- **Step 1:** Start on a blank page at the end of the document. Place the mouse cursor at the start of that page. (Sometimes it is the easiest to place a break after the last text to ensure you start on a new page.)
- Step 2: In the Citations & Bibliography select the drop-down arrow next to Bibliography.



Step 3: Select the bibliography you want to use. The most common type has the heading *References*.



Word will use all the references you have added in *sources* before to generate the bibliography for the document.

8 References

Knowles, S. J., 1895. *The Legends Of King Arthur And His Knights*. 8th ed. London: Frederick Warne and Co.

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Figure 7.2: An inserted reference list



- 1. Open Act7.6(Pangolins).docx.
 - a. Insert a new bibliography under "References" on the last page.
 - **i.** If the word "References" is repeated once you have inserted the bibliography, you can remove the original.
 - **ii.** Remember to update the Table of Contents once the Bibliography has been added to the document.

Save as Act7.6(Bibliography) and close the document.

INDEX

An index is an alphabetical list of names, subjects, concepts, etc. found at the end of a document with reference to the page (or pages) they are on. Indexes are generally used to provide a quick reference for readers on where they can find information in the document.

Before you can add the index, you will first need to mark items for the index.

Guided activity 7.11

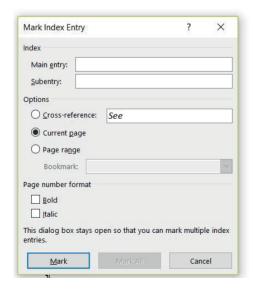
Step 1: Turn on Show/Hide in the Paragraph group on the Home tab.



- Step 2: Place the mouse cursor next to the word you want to index.
- **Step 3:** Select *Mark Entry* in the *Index* group on the *References* tab.



Step 4: Add a main and sub-entry name.

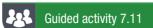


... continued

Something to know

You cannot insert an index or mark indexed items unless you have inserted a bibliography or list of references.

TERM 3 \mid CHAPTER 7 MAILINGS AND REFERENCES \mid UNIT 7.2 References



Step 5: Select Mark.

The dialogue box will stay open until you are done marking the index entries.

This is what the marked index entry will look like in the document.

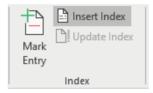
{-XE·"Rightful·king:Aurelius"-}¶

Once you have marked all the entries, you can then add the index.

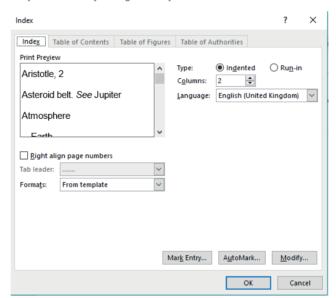
Guided activity 7.12

Step 1: On a new page after the Bibliography.

Step 2: Select Insert Index in the Index group.



Step 3: Make any changes or adjustments as needed and select OK.



Activity 7.7

- 1. Open Act7.7(Pangolins).docx.
 - **a.** Mark the following words in the text as items for the index:
 - i. Africa
 - ii. Poaching
 - iii. Scale
 - iv. Tongue

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b. Insert an index after the references.

Save as Act7.7(Index) and close the document.

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REVISION ACTIVITY

	KEV	ISION ACTIVITY	
1.	a.	en the <i>Chapter 7_Revision Activity 1</i> word processing document. Do the following: Set the top and right margins of the document to 2 cm. A cover page was inserted, but all the fields were not completed:	(2)
		i. Move the heading highlighted in green (page 3) to the document title position.ii. Display today's date in the appropriate field on the cover page.	(1) (1)
	C.	Create an automatic table of contents on the second page as indicated. Do the following before inserting the table of contents:	(0)
		 i. Apply the 'Heading 2' style to all headings highlighted in blue. ii. Modify all headings formatted as 'Heading 3' (highlighted in yellow) to display 7 pt before and 5 pt after each heading. 	(2)
		 iii. Create a new heading style by following the instructions below: Base the new style on 'Heading 1'. The new style is called 'STEM'. 	(_)
		 The font must not be expanded. iv. Insert the table of contents to display all three heading levels. 	(3) (3)
	d.	Find the pictures on page 4. Do the following: i. Insert a caption below the second picture indicating the following:	(0)
		'Figure 2 SA Rural education'. ii. Insert a table of figures on page 2.	(2) (2)
	e.	Make the following changes to the document: i. Add I. Pieterse as the author of the source 'Maths-and-science (2014)'. ii. Add a citation after the last word ('skills.') in the document to acknowledge the	(2)
2.	A le	source 'The 10 Skills Employers Most Want In 2015 Graduates'. iii. Insert a bibliography at the end of the document. Make sure the format is APA. en the <i>Chapter 7_Revision Activity 2</i> word processing document. Do the following: etter will be sent to the parents of the learners who scored less than 30% for either thematics or Physical Science.	(2)
	Use •	e the data from the spreadsheet 7Marks.xls and prepare a mail merge as follows: Sort the learners in ascending order according to their surnames. Replace all the text between '<< >>' with the appropriate fields.	
	•	Only include learners who scored less than 30% for either Mathematics or Physical Scier Save the document. Complete the merge.	ce.
	•	Save the merged document as 7Letter_Merged. Total: [(6) 30]

AT THE END OF THE CHAPTER

	CAN YOU	YES	NO
1	Use Mail Merge for labels?		
2	Use the referencing features to add captions, footnotes, citations, bibliographies, indexes and tables of contents?		



CHAPTER 8

SPREADSHEET FORMATTING

CHAPTER OVERVIEW

Unit 8.1: Advanced formatting

Unit 8.2: Advanced formulas and functions

Unit 8.3: Error indications

By the end of this chapter, you will be able to:



- Apply conditional formatting to cells.
- Use the AutoFill options.
- Use absolute cell referencing to keep a row or column constant.
- Describe spreadsheet functions.
- Apply the ROUND, SMALL, COUNTIF, COUNTA, COUNTBLANK, LARGE functions to cells.
- Demonstrate how to round numbers.
- Discuss the difference between rounding and formatting.
- Describe the circular reference and #NULL! error indicators.

INTRODUCTION

Excel is one of the most powerful tools in the Microsoft Office Suite, and learning to use it properly is one of the best things you can do. Excel is used in a wide range of professions, from teachers who use it to calculate term marks to finance professionals who use it to keep track of complex and important financial data.

Excel's built in tools make it easier for you to do simple and complex mathematics, organise, arrange and display data, analyse data and make predictions based on that data, etc.

FORMULAS IN A NUTSHELL

In Grade 10 you were taught about cell references. Cell references indicate a cell or a range of cells on a worksheet so that Microsoft Excel can find the values or data you want to use in a function or formula.

Cell references can be for a single cell, for example, C14 (which refers to the cell in column C, row 14), or for a range of cells, for example, A1:F4 (which looks at all the cells from column A, row 1 to column F, row 4).

While discussing cell references, you must also look at cell ranges. Cell ranges are usually a group of cells in a worksheet. They can be next to each other in a row (for example, A1:F1), below each other in a single column (for example, A1:A30) or in multiple columns and rows (for example, A1:F25). Ranges are indicated by a colon (:) in formulas.

Excel calculates the formulas you enter in a specific order. Excel calculates from left to right, starting at the equals sign (=), according to a specific order for each operator. The order for this is brackets (), negatives (for example -2), percent (%), exponents (^), multiplication and division (* and /), addition and subtraction (+ and -).

To change the order of a formula, you can use brackets around the part of the formula you want to calculate first. For example, the formula =5+2*3 will give you 11, since Excel multiplies 2 by 3 (to give you 6) and then adds the 5.



Figure 8.1: Formula with no brackets

But, if you use brackets to change the formula to $=(5+2)^{*}3$, you will get 21, since Excel works out the sum in the bracket first (to give you 7) and multiplies that total by 3.



Figure 8.2: Formula with brackets

Lastly, Excel uses various error indicators to show when or where something has gone wrong in a spreadsheet:

ERROR INDICATOR	DESCRIPTION	
#######	Displayed when a column is not wide enough to display all the numbers in a cell, or if the cell displays a negative time and date.	A 1 ########
#NAME?	#NAME? Shown when Excel does not recognise the text in a formula (if something is spelled incorrectly, for example).	
#DIV/0!	Shown when a number is divided by zero or in a cell with no value.	A 1 #DIV/0!
#REF!	Displayed when a cell reference is not valid. This can happen when you delete cells that other formulas referred to.	A 1 #REF!
#VALUE!	Displayed when the formula contains cells with different data types (letters and numbers, for example).	A 1 #VALUE!
#NUM!	Shown when a formula or function has invalid numerical values, for example \$1,000 will give this error, because the \$ is used as an absolute reference and the comma (,) is a separator in formulas. In Excel 2014, this was replaced with the semicolon (;).	A 1 #NUM!

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8.1 Advanced formatting

CONDITIONAL FORMATTING

Conditional formatting is a way to apply formatting automatically. It also helps you analyse the data. You can make worksheet data easier to interpret by using conditional formatting to format cells based on their values. If a value meets a particular condition, Excel applies the formatting; if it doesn't, the formatting is not applied.

There are many built-in options to the conditional formatting in Excel. Table 8.1 briefly describes each built-in rule.

Usage (Wa	att hours)										
From	То	01-Sep	02-Sep	03-Sep	04-Sep	05-Sep	06-Sep	07-Sep	08-Sep	09-Sep	10-Sep
12:00 AM	1:00 AM	1190	555	1215	585	1050	1960	1050	675	760	1870
1:00 AM	2:00 AM	4755	530	830	445	1190	2520	630	625	550	575
2:00 AM	3:00 AM	3735	505	850	485	585	1225	525	590	525	540
3:00 AM	4:00 AM	420	525	810	455	305	1100	450	555	550	555
4:00 AM	5:00 AM	410	515	800	530	390	795	450	670	540	540
5:00 AM	6:00 AM	410	515	805	820	375	785	440	545	530	560
6:00 AM	7:00 AM	1010	1155	1380	1085	365	790	435	565	535	545
7:00 AM	8:00 AM	1940	1980	2065	615	445	870	675	510	750	615
8:00 AM	9:00 AM	1870	1900	2090	455	435	925	770	755	760	615
9:00 AM	10:00 AM	1920	1955	2770	1605	1630	2765	1790	2085	2065	1790
10:00 AM	11:00 AM	1895	1845	2840	1710	2055	2105	1745	1980	2305	1825
11:00 AM	12:00 PM	1835	1755	5230	1915	3160	2115	1815	2500	2135	1810

Figure 8.3: Colour scales and other conditional formatting can make it easy to quickly identify data trends

Table 8.1: Conditional formatting rules

RULE	DESCRIPTION		
Highlight Cells Rules	Allows you to highlight data based on certain conditions (for example, highlight all cells with a value greater than 4 000 or less than 100). You can also use this to find values in a range, highlight cells containing specific text or highlight cells containing duplicate values.		
Top/Bottom Rules	These rules allow you to find the 10 top or bottom values, the top and bottom 10% of values or values that are over or below average. This tool is very useful for teachers who want to track class performance.		
Data Bars	Adds a coloured bar to highlight the data in the cell. The longer the bar, the higher the value. Data bars are almost like bar graphs for each individual value.		
Colour Scales	our Scales Colour scales use a gradient to apply background colour to a cell based on where the value of that cell falls in a range. The darker the colour, the higher the value.		
Icon Sets	Used to add different symbols, ratings and indicators based on the values in the cell. For example, if you wanted to track monthly sales of products, you could use arrow indicators to show where sales went up, down or stayed the same.		

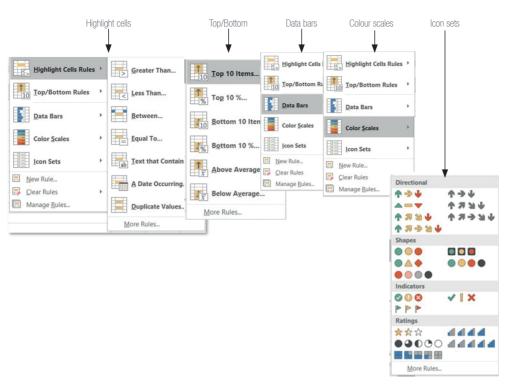


Figure 8.4: There are many built-in conditional formatting options



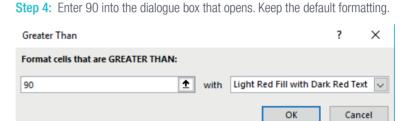
In this example, we want to highlight all marks above 90 in the file GA 8_1.xlsx.

Step 1: Select the data you want to highlight.

	А	В
1	Name	Mark
2	Jackson Love	70
3	Priya Patel	97
4	Sharia Clemmons	95
5	Ming Lu	91
6	Thembiso Tshabalala	86
7	Jensen Howard	54
8	Taariq Mosagee	77
9	Maria Saldana	100
10	Kyle Jacobs	90
11	John Feinstein	89
12	Calvin September	75
13	Bongani Sithole	93
14	Betsy Michaels	90
15	Dexter Cooper	62

... continued

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Step 5: Select OK. The marks above 90 are now highlighted.

	А	В	
1	Name	Mark	
2	Jackson Love	70	
3	Priya Patel	97	
4	Sharia Clemmons	95	
5	Ming Lu	91	
6	Thembiso Tshabalala	86	
7	Jensen Howard	54	
8	Taariq Mosagee	77	
9	Maria Saldana	100	
10	Kyle Jacobs	90	
11	John Feinstein	89	
12	Calvin September	75	
13	Bongani Sithole	93	
14	Betsy Michaels	90	
15	Dexter Cooper	62	

You can also highlight cells that contain text.

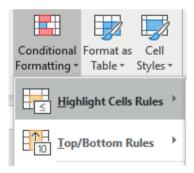
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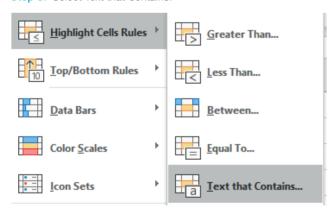
Step 1: Select the data you want to highlight in the datafile *GA 8_2.xlsx*.

	А	В
1	Name	Sport
2	Jackson Love	Soccer
3	Priya Patel	Hockey
4	Sharia Clemmons	Netball
5	Ming Lu	Hockey
6	Thembiso Tshabalala	Hockey
7	Jensen Howard	Soccer
8	Taariq Mosagee	Soccer
9	Maria Saldana	Netball
10	Kyle Jacobs	Hockey
11	John Feinstein	Soccer
12	Calvin September	Soccer
13	Bongani Sithole	Soccer
14	Betsy Michaels	Hockey
15	Dexter Cooper	Hockev

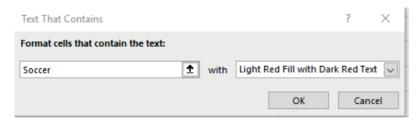
Step 2: Select Conditional Formatting and then select Highlight Cells Rules.



Step 3: Select Text that Contains.



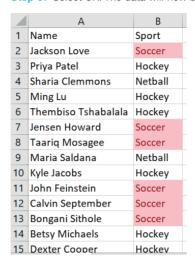
Step 4: Enter "soccer" into the dialogue box that opens. Keep the default formatting.



... continued



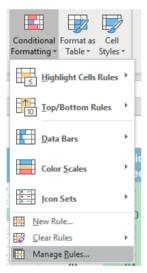
Step 5: Select OK. The data will now be highlighted.



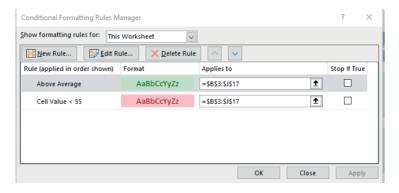
You can also edit and change the existing conditional formatting in a spreadsheet by using the Manage Rules function.

Guided activity 8.3

Step 1: Select the down arrow next to Conditional Formatting and then select Manage Rules.



Step 2: Select the arrow next to Show formatting rules for: and select This Worksheet.

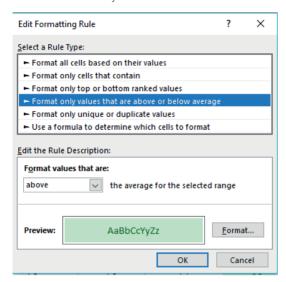


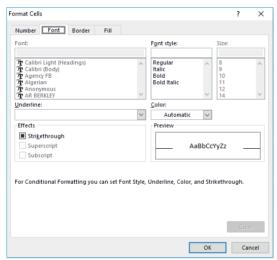
... continued

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Step 3: Double click on the rule you want to edit to open the *Edit Formatting Rule* dialogue box and select what you want to edit.





You can change the *Rule Type or Edit the Rule Description*. You can also change the formatting of the conditional formatting rule.



Activity 8.1

Work in the Learners worksheet of Act8.1 (Report).xlsx

- **1.** Apply conditional formatting to column G so that all cells showing learners that have reported bullying:
 - a. Appear in a light grey fill.
 - **b.** Have a green border.
- 2. Apply conditional formatting to column D so that all cells showing learners younger than 17 appear in:
 - a. A red fill, and

learners older than 17 appear in

- b. a green fill with a blue border.
- 3. Edit the conditional formatting rules for column E so that all cells showing learners from the B group appear in:
 - a. purple

AUTOFILL OPTIONS

The AutoFill option in Excel allows you to automatically fill in cells with data that follows a pattern or that is based on data in other cells. This allows you to save time when you are adding data to an Excel spreadsheet.

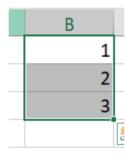
The example below shows you how to use AutoFill in Excel.



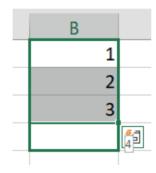
Guided activity 8.4

Step 1: Select one or more cells you want to use as a basis for filling additional cells.

Step 2: For a series like 1, 2, 3, 4, 5..., type 1 and 2 in the first two cells.

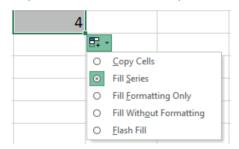


Step 3: Drag the fill handle down.

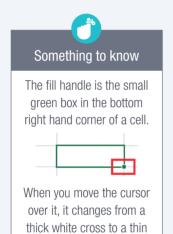


You can also AutoFill data horizontally. To do this, you drag the fill handle across the row (instead of down the column).

Step 4: If needed, select AutoFill Options and choose the option you want.



The AutoFill options button allows you to select what type of data you want to fill in the cells. These options will change depending on the data you are working with, but there are options that stay the same. Table 8.2 explains what each option is.



black cross.

Table 8.2: AutoFill options

OPTION	DESCRIPTION
Copy Cells	Copies the value in a cell into the selection.
Fill Series	Fills in the next numbers, days or dates in a series.
Fill Formatting Only	Takes the formatting in a cell and fills it in the other cells in the selection, for example, the text colour or a highlight.
Fill Without Formatting	Fills in only the values and not the formatting from the first few cells.
Flash Fill	Looks at the data in the cells next to the one you selected, detects a pattern and then fills the cells with that pattern.
Fill Days	Fills in the names or dates of days in the range you selected.
Fill Weekdays	Fills in only the names or dates of weekdays (not Saturday or Sunday) in the range you selected.
Fill Months	Fills in the month in a date. For example, if you only want a list of the last days of the month, you will use this option.
Fill Years	Changes the years in a date to be consecutive years. For example, you can start the list with the date 01/11/2018, use Fill Years and have the list be 01/11/2019, 01/11/2020, 01/11/2021, etc.

1

Activity 8.2

Open the file *Act8.2(Autofill)* and work on the *Incident* worksheet. Use AutoFill to complete the following columns for each person:

- Column A: so that we can see how many entries there are to the worksheet
- Column E: A unique code is created for every person

Also, complete:

- Column N: Months of the year
- · Column O: Days of the week
- Column P: Create a custom list so when the Autofill feature is used, the nine South African Provinces are shown based on the data in the Custom List sheet.

ABSOLUTE CELL REFERENCING

In Excel all cell references in are relative references. This means that the reference is based on the location of the cell. For example, in Figure 8.5, the formula in Cell D2 (=B2*C2) will change to =B3*C3 if we copy it into Cell D3.

4	Α	В	С	D	E
1	ITEM	UNIT PRICE	QUANTITY	LINE TOTAL	
2	Coca-cola 300ml	R5.80	64	R371.20	
3	Coca-cola 400ml	R6.20	78	=B3*C3	
4	Diet Coke 300ml	R5.20	56	R291.20	
4					

Figure 8.5: No absolute referencing applied

Using relative references means you do not need to retype the formula for each cell, you simply need to copy the formula from one cell to another and it will update based on where it is in the spreadsheet.

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Absolute cell referencing, on the other hand, lets you move a formula around on a worksheet without changing the cell references. You create an absolute reference by using the dollar sign (\$) in front of the column name, row number or both. To add in the VAT (which is the same 15% for every item) in the above example, you would use an absolute cell reference which is contained in cell F1.

In this case, you type in 15% in Cell F1 and then use the formula =D2*\$F\$1 in cell E2 to work out the total VAT for all the products in row 2.

4	Α	В	С	D	Е	F
1	ITEM	UNIT PRICE	QUANTITY	LINE TOTAL	TOTAL VAT	15%
2	Coca-cola 300ml	R5.80	64	R371.20	=D2*\$F\$1	
3	Coca-cola 400ml	R6.20	78	R483.60	R72.54	

Figure 8.6: Formula with absolute referencing

If you copy the formula down to cell D3, the reference to cell F1 will stay the same.

4	А	В	С	D	Е	F
1	ITEM	UNIT PRICE	QUANTITY	LINE TOTAL	TOTAL VAT	15%
2	Coca-cola 300ml	R5.80	64	R371.20	R55.68	
3	Coca-cola 400ml	R6.20	78	R483.60	=D3*\$F\$1	
4	Diet Coke 300ml	R5.20	56	R291.20	R43.68	

Figure 8.7: Formula with absolute referencing

You can also mix relative references and absolute references in a formula, by only adding the dollar symbol to one of the two values, for example:

\$A1 makes the column name absolute, so all information would have to come from column B

	А	В	С
1	12	13	
2	18	16	=\$A1*B2
_			

B\$1 makes the row number absolute, so all information would have to come from row one.

	А	В	С	
1	12	13		
2	18	16	=A2*B\$1	

2

Activity 8.3

Open Act8.3(Club).xlsx and work in the Music sheet.

- 1. Change the function in:
 - cell H2 so that it can be copied into cells H3:H17 and still give the correct results as in the current cells.
 - cell F2 so that it can be copied into cells F3:F17 and still give the correct results as in the current cells.
 - cell L2 so that it can be copied into cells L3:L17 and still give the correct results for all the years.

8.2 Advanced formulas and functions

Excel was designed to be primarily a spreadsheet program, so it is particularly powerful when it comes to calculating numbers and solving complex equations.

Before you can learn how to use the functions and formulas, you will need to know the difference between the two. A *formula* is an expression that uses the values in a cell or range of cells to calculate the value of those cells. It is an instruction to Excel about what you want to do. All formulas begin with an equal sign (=) to let Excel know that it must do something to the data that follows it. An example of a formula is =A1+A2+A3+A4, which tells Excel to add up all the values in cells A1 to A4 and return a result.

A function is a formula that is built-in to Excel. Functions perform specific calculations in a particular order based on the values in the cells and the function's name. These are called arguments or parameters. For example, the function =SUM does what the example above does, but without you needing to add the plus sign (+). Instead, you can type in =SUM(A1:A4) and Excel will add up the values in cells A1 to A4.

There are over 400 functions in Excel, but you do not need to know the name of each and every one. You can access the functions in the *Function Library* on the *Formulas* tab.

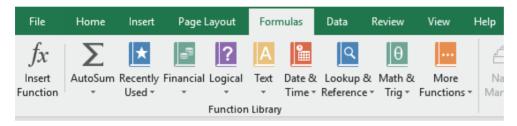


Figure 8.8: The Function Library

Excel also has something called Formula Intellisense, which helps you find a function based on the information you type into a cell and prompt the function's syntax and arguments as you type. You can see this in Figure 8.9.

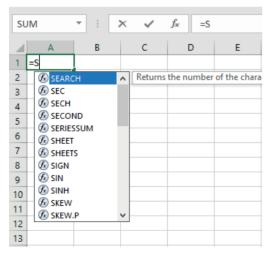


Figure 8.9: Formula Intellisense in action

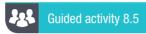
In the figure above, you may notice a small text window next to SEARCH. This is the description of the function. To see this, hover the mouse cursor over the function name.

USING SPREADSHEET FUNCTIONS

The ROUND function rounds a number to a specified number of digits. For example, if cell A1 contains the number 23.7825, and you want to round that value to two decimal places, you can use the following formula:

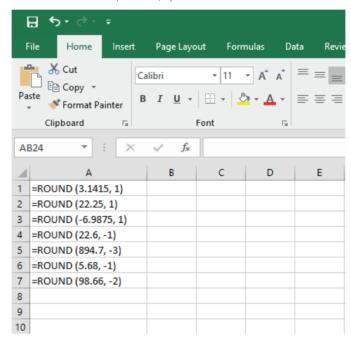
=ROUND(A1, 2).

The result of this function is 23.78.

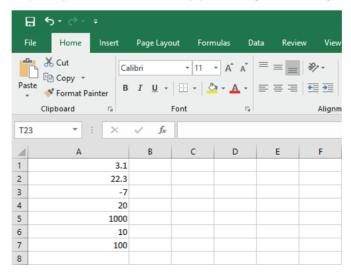


Step 1: In a blank Excel worksheet, enter the following data into column A:

- =ROUND(3.1415, 1) to round to one decimal place.
- =ROUND(22.25, 1) to round to one decimal place.
- =ROUND(-6.9875, 1) to round to the nearest whole number.



Step 2: If you have done this correctly, you should get the following results:



You can also use ROUND with cell references, for example =ROUND(A1, 1), if you would like to have the original number and the rounded number side by side.

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The difference between rounding and formatting

Rounding and formatting may look the same, but they're not. Rounding lets you get a specific value, while formatting only displays the first (x) digits of a decimal number.

In everyday life, rounding is commonly used to make numbers easier to estimate, communicate or work with. For instance, you can use rounding to make long decimal numbers shorter, to report the results of complex calculations or round off currency values. Excel's ROUND functions alter the actual value in a cell.

If you want to round numbers in Excel to make the spreadsheet look neater, you can change the cell's format. This method changes the display format without changing the actual value stored in a cell. If you refer to that cell in any formula, the original non-round value will be used in all calculations.

The SMALL and LARGE functions do similar things. They return the smallest or largest value (based on a condition that you set) from a set of values. This means that in a range of numbers, you can specify that you're looking for the fourth or second smallest or largest number.

For example, if you have a list of numbers in cells A1 to A16, you can enter the formula =SMALL(A1:16, 4) into cell B17 to get the fourth smallest number in the range and the formula

=LARGE(A1:A16, 2) in cell B18 to get the second largest number. You can see this in Figure 8.10.

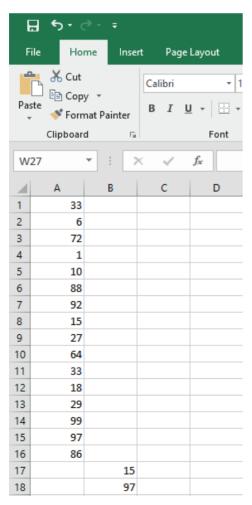


Figure 8.10: SMALL and LARGE applied to a range of numbers



EXAM TIP

Always keep the data in mind when you are applying LARGE and SMALL. For example, if you are looking for the fastest lap time, it will be the smallest number.

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The POWER function returns the result of a number raised to a power. For example, if you have the value 2 in cell A1 and you want to know what the result will be if you raised it to 10, you could enter the formula =POWER(A1, 10) into cell B1 to get the answer, or 1 024. You can also use a caret (^) instead of the POWER function.

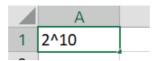


Figure 8.11: Using a caret instead of the POWER function

THE COUNT FUNCTIONS

COUNT counts cells containing numerical values.

COUNTA counts cells containing any type of information. For example, if the range contains a formula that returns an empty string, the COUNTA function counts that value. The COUNTA function does not count empty cells.

COUNTBLANK counts the number of empty cells in a range.

FUNCTION	DESCRIPTION	EXAMPLE
SUM	This function adds all the values in a cell range.	=SUM(B2:B10)
AVERAGE	This function calculates the average of the values.	=AVERAGE(B2:B10)
COUNT	This function counts the number of cells that have numerical values.	=COUNT(B2:B10)
MIN	This function finds the minimum value in a specific cell range.	=MIN(B2:B10)
MAX	This function finds the maximum value in a specific cell range.	=MAX(B2:B10)



Activity 8.4

Open Act8.4(Rain).xlsx and work in the Rain spreadsheet.

- 1. Insert a function in cell G48 to determine the total rainfall for April.
- 2. Insert a function in cell H49 to determine how many times no rain fell in May.
- 3. Insert a function in cell K50 to determine the highest rainfall in August.
- 4. Insert a function in cell M51 to determine the lowest rainfall in October.

8.3 Error indicators

Error indicators are Excel's way of letting us know that we did something incorrectly when entering a formula and that our logic does not make sense. In Grade 10, you were taught about ######, #NAME?, #DIV/0!, #REF!, #VALUE! and #NUM!, which are all used to alert you that the values in the formula or the formula's parameters are incorrect.

In this unit, you learn about two new error indicators, namely circular references and #NULL!.

CIRCULAR REFERENCE

A circular reference error happens when the formula you entered is trying to calculate a value in the cell you put it in, which means that the formula keeps going in circles, almost like a dog chasing its own tail. You can see an example of this error message in Figure 8.12.

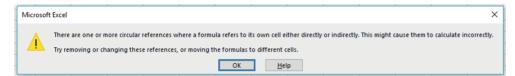
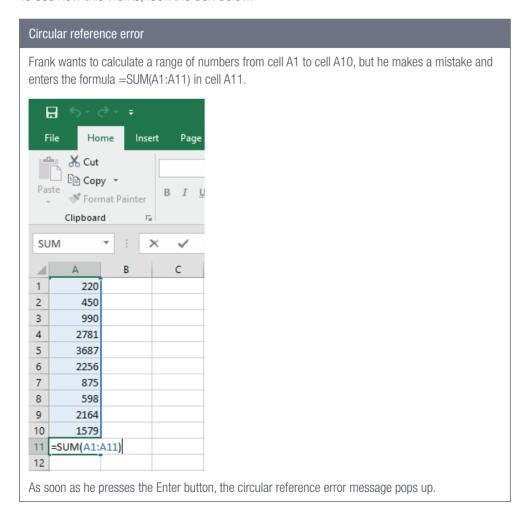


Figure 8.12: The circular reference error message

To see how this works, look the box below.



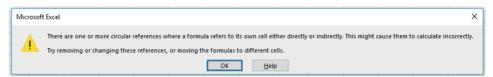
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HOW TO FIX CIRCULAR REFERENCE ERRORS

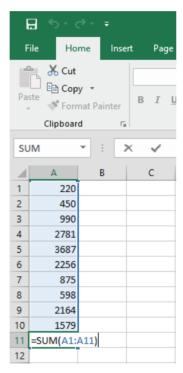
Circular reference errors are relatively simple to fix. All you need to do is go to the formula and check it very carefully.



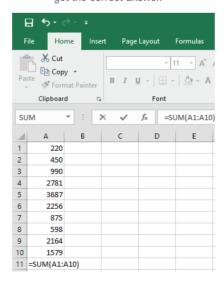
Step 1: Select *OK* in the error message that pops up.



Step 2: Go to the formula you were trying to calculate and check the cell references.

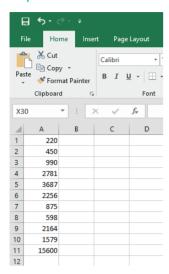


Step 3: Change the incorrect cell reference to the correct one. In this case, change A11 to A10 to get the correct answer.



... continued

Step 4: Press Enter to let Excel calculate the sum.



#NULL!

#NULL! errors happen in one of two cases:

- 1. When you use an incorrect range operator in a formula, for example, using a semicolon (;) instead of a colon (:) to separate cell ranges.
- When you use a space between range references to specify an intersection between two ranges that do not intersect. An intersection in Excel is a point in the spreadsheet where the data in two or more ranges cross.

The reference operators in Excel are the:

- Range operator (colon or :) which defines the reference to a range of cells.
- Union operator (comma or ,) that combines to references into one reference.
- Intersection operator (a blank space) that indicates the intersection of two ranges.
- You can see an example of a #NULL! error in Figure 8.13.

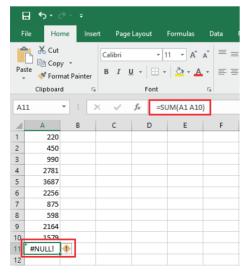


Figure 8.13: A #NULL! error

As you can see, the range operator (:) has been left out of the sum.

HOW TO FIX #NULL! ERRORS

You need to check that you are using the correct syntax in the formula. This means that you must make sure that you are using a colon when you are referencing a range of cells that follow on from each other (for example A2:A36 or A1:R1) or a comma to reference cells that need to be combined (for example A1:A25,A36 or A1:L1,M1).



Activity 8.5

Open Act8.5(Data Errors).xlsx. Select OK on the error message that opens.

- 1. Determine why the #NULL! error is in all the cells and correct it.
- 2. Correct the circular references.

REVISION ACTIVITY

Open the Chapter 8_Revision Activity spreadsheet. Work in the Travellers worksheet.

The worksheet shows the statistics of the arrival and departures of travellers using the King Shaka airport from 2010 to 2014.

airport from 2010 to 2014.	
1. Format the cells in row 1 as follows:	
a. Merge the text in row 1 from cells A1:11.	(1)
b. Change the row height of row 1 to 57.	(1)
c. Change the size of the heading in row 1 to 22 pt.	(1)
2. Adjust the column width of rows 2 & 3 so that all the subheadings are clearly visible.	(1)
3. Column C has the arrival months of the travellers. Use AutoFill to continue the arrival months.	(1)
4. Apply conditional formatting to column D so that all the cells displaying more than	
4000 SA arrivals:	(3)
a. Appear in a light blue fill.	
b. Have a red border.	
5. In cell D54 calculate the number of SA residents that arrived at the Airport.	(2)
6. In cell L4 determine the second largest number of foreign travellers that have departed	
from the airport.	(2)
7. In cell L5 determine the least number of SA residents that have departed from the airport.	(2)
8. Use a function in cell L6 to determine how many visitors overnighted in May.	(2)
Work on the <i>Foreign</i> worksheet. The spreadsheet contains the number of nights spent in	
each province by foreign tourists.	
9. Change only the vertical borders between the headings in row 2 to a reddish line.	(2)
10. Insert a function in cell L3 to display the average number of ALL Malawian visitors to	
South Africa.	(3)
11. Insert a function in cell L4 to show how many provinces did not receive Mozambican	
visitors who came by air.	(2)
12. Use conditional formatting to automatically display from which 8 countries the most	
travellers to KwaZulu Natal came. Fill the background of these cells with any background	(0)
colour of your choice.	(3)
13. Use a function in cell B50 to calculate all the foreign tourists who visited Gauteng.	(2)
14. Insert a function in cell L5 that will display how many countries had people visiting	(0)
North West.	(2)
Total:	[30]

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AT THE END OF THE CHAPTER

	CAN YOU	YES	NO
1	Apply conditional formatting to cells?		
2	Use the AutoFill options?		
3	Use absolute cell referencing to keep a row or column constant?		
4	Describe spreadsheet functions?		
5	Apply the ROUND, SMALL, COUNTIF, COUNTA, COUNTBLANK, LARGE functions to cells?		
6	Demonstrate how to round numbers.		
7	Discuss the difference between rounding and formatting?		
8	Describe the circular reference and #NULL! error indicators.		

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CHAPTER 9

IF FUNCTIONS AND CHARTS

CHAPTER OVERVIEW

Unit 9.1: Simple IF function

Unit 9.2: Relational operators

Unit 9.3: Charts

By the end of this chapter, you will be able to:



- Use SUMIF and COUNTIF.
- Describe the use of relational operators in simple IF statements.
- Create and interpret charts and graphs in Excel.
- Format and edit charts and graphs in Excel.
- Embed charts and graphs into Microsoft Word.

INTRODUCTION

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The IF function is one of the most used functions in Excel. IF statements allow you to compare conditions in a worksheet. Simply put, IF statements allow you to say that if one condition is true, then the formula should do something. If it is not, the formula should do something else. IF statements can return text, values or even more calculations.

One of Excel's most useful visual tools are the charts and graphs you can create using data. Charts and graphs help you create a visual representation of data that makes it easier for others to interpret and analyse the data.

In this chapter, you will learn about simple IF functions and how to use them as well as how to create charts using data in Excel.

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Simple IF function 9.1

The IF function is built-in to and is one of the Logical Functions in Excel, which means that it follows the logic of IF something is true, then do this, else/otherwise do that. It can be entered as part of a formula in a cell of a worksheet or it can stand alone in a cell. IF statements are usually written with the following syntax:

IF (condition, value_if_true, [value_if_false])

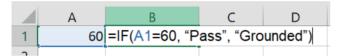
Where the condition is the value you want to test, the value_if_true is the value that the function gives you if the condition is true and the value_if_false is the value that the function returns if the condition is false.

Guided activity 9.1

Step 1: Enter the number 60 in cell A1.



Step 2: In cell B2, enter the formula = IF(A1=60, "Pass", "Grounded"). This says that if A1 is 60, enter "Pass". If it is not, enter "Grounded".



Step 3: Press *Enter* to see the result.

	А	В
1	60	Pass
2		

Let us look at another example of an IF statement in action.

Guided activity 9.2

Step 1: Enter the word rain in cell A1.

	А	
1	Rain	

Step 2: In cell B2, enter the following IF statement = IF(A1="rain", "umbrella", "cap")

	А	В	С	D	
1	Rain	=IF(A1="r	ain", "umb	rella", "cap) ")
_					

Step 3: Press *Enter* to see the result.

	А	В	
1	Rain	umbrella	
_			

Something to know

You can work along with these examples in a blank Excel spreadsheet.

TERM 3 | CHAPTER 9 IF FUNCTIONS AND CHARTS | UNIT 9.1 Simple IF function



Activity 9.1

Open *Act9.1(Learners).xlsx* and work in the Members worksheet. An email must be sent to every person who does NOT have a cell phone number (Column G).

- 1. Insert a function in cell I3 to determine if an email needs to be sent. If an email must be sent, "Yes" must be displayed, otherwise "No" needs to be displayed. Copy this function to cells I4:I101
- 2. Every member who joined in 1998 (Column C) qualify for a discount in membership fees. Insert a function in cell J3 to determine which members qualify for a discount. If a member qualifies, "Qualify" must be displayed, otherwise "Not qualify" needs to be displayed. Copy this function to cells J4:J101
- 3. Members who paid on the 25th day or later (Column E) will be fined for late payment. Insert a function in cell K3 to determine if a member must be fined. If the entry shows the day 25 or later, "Fined" must be displayed, otherwise "No Fine" needs to be displayed. Copy this function to cells K4:K101

SUMIF

The SUMIF function lets you sum in one range based on a specific criterion you look for in another range. This means that you can use the values in a range to modify the values in another range.

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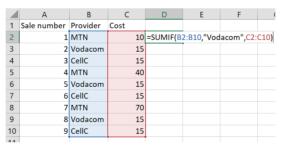


Guided activity 9.3

Open the spreadsheet GAct 9.3.xlsx. Calculate the total sales of Vodacom airtime only.

	А	В	С
1	Sale number	Provider	Cost
2	1	MTN	10
3	2	Vodacom	15
4	3	CellC	15
5	4	MTN	40
6	5	Vodacom	15
7	6	CellC	15
8	7	MTN	70
9	8	Vodacom	15
10	9	CellC	15

Step 1: In cell D2, enter the formula = *SUMIF*(*B2:B10,"Vodacom",C2:C10*)



Step 2: Press Enter to see the result.

4	А	В	С	D
1	Sale number	Provider	Cost	
2	1	MTN	10	45
3	2	Vodacom	15	
4	3	CellC	15	
5	4	MTN	40	
6	5	Vodacom	15	
7	6	CellC	15	
8	7	MTN	70	
9	8	Vodacom	15	
10	9	CellC	15	

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To make sure that you do not make logic or argument mistakes in functions like SUMIF, you can use the *Function Builder* in Excel. This tool gives you tips and guidance on how to build functions and keep arguments in the correct order.



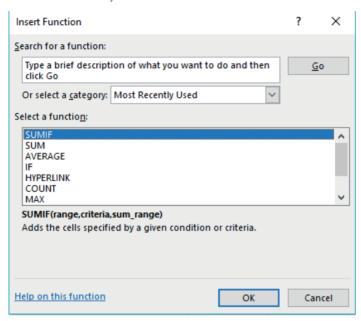
Open the spreadsheet *GAct 9.3.xlsx*. Using our data from the previous example, we want to calculate all CellC data sales.

Step 1: Select cell D2.

Step 2: Select the Function Builder icon next to the Formulas bar.

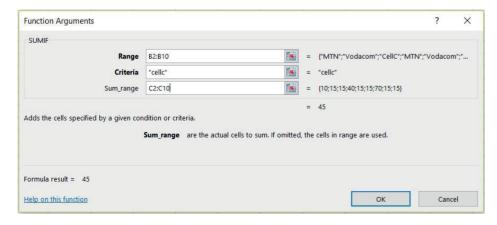


Step 3: Type a brief description of what you want to do, select a category or select a function to find the function you want to use.



- Step 4: Select the function you want to use (SUMIF) and then select OK.
- **Step 5:** Begin filling in the function arguments and then select *OK*.

To select the range, you can return to the sheet by selecting on the arrow next to the *Input* bar. Select the range and press enter to return to the *Function Builder*.



... continued

TERM 3 | CHAPTER 9 IF FUNCTIONS AND CHARTS | UNIT 9.1 Simple IF function

Step 6: See the result in cell D2.

	А	В	С	D
1	Sale number	Provider	Cost	
2	1	MTN	10	45
3	2	Vodacom	15	
4	3	CellC	15	
5	4	MTN	40	
6	5	Vodacom	15	
7	6	CellC	15	
8	7	MTN	70	
9	8	Vodacom	15	
10	9	CellC	15	



Activity 9.2

Open Act9.2(Sales).xlsx and work in the Data worksheet.

- 1. Insert a function in cell I3 to determine the total value (Column H) of all the products sold by the 7Digital Store (in column A). Remember to format the answer as Currency.
- 2. Insert a function in cell I6 to determine the total value (Column H) of all the MP3s (in column A) sold. Remember to format the answer as Currency.
- **3.** Insert a function in cell I9 to determine the total value (Column H) of all the products sold by the artist Green Day (in column D). Remember to format the answer as Currency.
- **4.** Insert a function in cell I12 to determine the total value (Column H) of all the products sold by the Label EMI UK (in column E). Remember to format the answer as Currency.
- **5.** Insert a function in cell I15 to determine the total value (Column H) of all the DVDs sold (in column B). Remember to format the answer as Currency.

COUNTIF

The COUNTIF function counts the number of cells that meet a criterion; for example, to count the number of times a particular city appears in a customer list.

In its simplest form, COUNTIF says:

=COUNTIF(Where do you want to look?, What do you want to look for?).

For example: =COUNTIF(A2:A5,"London"); =COUNTIF(A2:A5,A4)



Activity 9.3

Open Act9.3(sales).xlsx.

- 1. Insert a function in cell E3 to determine how many sales were made by Williams (in column A).
- 2. Insert a function in cell E6 to determine how many sales were made by Jones (in column A).
- 3. Insert a function in cell E9 to determine how many sales were made in Qtr. 2 (in column D).

9.2 Relational operators

You can use relational operators (>, <, <=, >= and <>) in simple IF functions. These will help you refine the data even more. Table 9.1 gives a brief explanation of each relational operator.

Table 9.1: Relational operators in Excel

OPERATOR	DESCRIPTION	
>	Greater than. Used to determine if one value is larger than another.	
<	< Less than. Used to determine if one value is lower than another.	
<=	Less than or equal to. Used to determine if one value is less than or the same as another value.	
>= Greater than or equal to. Used to determine if one value is more than o another value.		
<>	Not equal to. Used to show that two values are not equal to each other.	

Guided activity 9.5

Mr Tshabalala wants to see if his students may play on the soccer team. They may only play if they have less than 20 demerit points. Open the spreadsheet *GAct 9.5.xlsx*.

Step 1: Mr Tshabalala enters the formula = *IF*(C2>20, "No", "Yes") in cell D2. This says that if the student has more than 20 demerit points, they may not play on the soccer team.

	Α	В	С	D	Е	
1	First name	Last name	Demerits			
2	Andrews	Steven	15	=IF(C2>20	,"No","Yes	")
3	Becker	Andries	22			

Step 2: He presses *Enter* to view the result.

	Α	В	С	D
1	First name	Last name	Demerits	
2	Andrews	Steven	15	Yes
3	Becker	Andries	22	

Step 3: He then copies the formula down to check the rest of the data.

4	А	В	С	D
1	First name	Last name	Demerits	
2	Andrews	Steven	15	Yes
3	Becker	Andries	22	No
4	De Jong	Willem	5	Yes
5	Dlamini	Kagiso	0	Yes
6	Fischer	Christopher	10	Yes
7	Kelley	Grant	8	Yes
8	Landry	Andrew	29	No

You can use relational operators in IF statements to force additional calculations to be performed if a certain condition is met.

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Guided activity 9.6

Open the spreadsheet *GAct 9.6.xlsx*. A school administrator wants to check how many Grade 10 learners can be classified as teenagers (younger than 16) or young adults (16 years old and older). He takes the class list of all Grade 10 learners in his school and does the following:

Step 1: In cell C2, he enters the formula = *IF*(B2>=16, "Young adult", "Teenager"). This states that if the learner is older than or is 16, they are classified as a young adult.

	А	В	С	D	E
1	Name	Age			
2	Jerry Cook	16	=IF(B2>=16,"Young adult","Teenager")		
3	Kagiso Lethuli	15			

Step 2: She presses *Enter* to see the result.

A	А	В	С	D
1	Name	Age		
2	Jerry Cook	16	Young adult	
3	Kagiso Lethuli	15		
4	Andrew Banks	15		

Step 3: She copies the formula down to check the rest of the data.

	M	U	C
	Name	Age	
!	Jerry Cook	16	Young adult
	Kagiso Lethuli	15	Teenager
Ļ	Andrew Banks	15	Teenager
,	Thiasha Pillay	14	Teenager
i	Danie van Vuuren	16	Young adult
•	Barry Williams	15	Teenager
	Alna Joubert	15	Teenager
1	Herman du Toit	17	Young adult
0	Paulo de Freitas	14	Teenager
1	Brenton Naidoo	16	Young adult
2	Oliver Parker	15	Teenager
3	Dineo Rabada	15	Teenager

While the calculations in these activities could be done manually (since the amount of data was small), it would be very time consuming to do this with a larger set of data. Imagine if the worksheet had 4 000 entries. It would be labour intensive to go through all of the entries and check each one. This is why using IF statements are very useful since the statements will check the entries for you.

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Activity 9.4

Open Act9.4(Dublin).xlsx. Work in the List worksheet.

- 1. The organisers of St Patrick's Day want to know with which currencies they will be dealing with, whether visitors will contribute pound sterling, dollars or Yen.
 - **a.** Insert a function in cell G3 to determine which visitors in Column F are from the UK. If they are from the UK the word "Pounds" must be displayed, otherwise "No Pounds" must be displayed. Copy this function to the cells in Column G for all visitors.
 - **b.** Insert a function in cell H6 to determine which visitors in Column F are from the USA. If they are from the USA the word "Dollars" must be displayed, otherwise "No Dollars" must be displayed. Copy this function to the cells in Column H for all visitors.
 - c. Insert a function in cell I4 to determine which visitors in Column F are from the Japan. If they are from the Japan the word "Yen" must be displayed, otherwise "No Yen" must be displayed. Copy this function to the cells in Column G for all visitors.
 Work in the Summary worksheet
 - **d.** Insert a function in cell C2 to display "True" if the total number of visitors per city (Column B) is 4 visitors or more. Otherwise, the function must display "False". Copy the function to indicate for all cities' visitors up to cell B21.
 - **e.** Insert a function in cell D2 to display "True" if the total number of visitors per city (Column B) is less than 8. Otherwise, the function must display "False". Copy the function to indicate for all cities' visitors up to cell B21.

TERM 3 | CHAPTER 9 | IF FUNCTIONS AND CHARTS | UNIT 9.2 Relational operators

9.3 Charts

Charts are especially important when you are presenting data in a report. In this unit, you will learn how to create charts and graphs, how to format them and how to edit them.

In Mathematics and Maths Literacy, you learned about graphs. In Excel, we call these charts. In this unit, we will refer to them as charts.

CREATING CHARTS

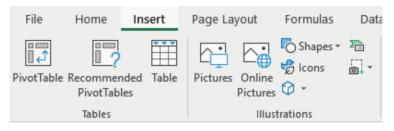
Charts can only be created when the data is in the sheet and is sorted in a logical way. In Excel, charts are under the *Insert* tab in the Illustrations group.



Step 1: Select data for the chart.

4	А	В	С	D	Е	F	
1	Genre	2014	2015	2016	2017	2018	
2	Classics	R27,228.00	R25,984.00	R20,346.00	R18,223.00	R15,547.00	
3	Young Adult	R30,056.00	R32,128.00	R36,987.00	R42,694.00	R65,321.00	7.
4	Science Fiction & Fantasy	R9,150.00	R8,561.00	R8,498.00	R9,589.00	R8,924.00	
5	Mystery	R25,667.00	R25,432.00	R27,629.00	R27,978.00	R28,456.00	
6	Thriller	R25,945.00	R25,165.00	R28,078.00	R29,656.00	R30,215.00	
7	Romance	R35,065.00	R32,973.00	R33,756.00	R33,561.00	R33,798.00	
8	Non-fiction	R18,655.00	R26,563.00	R20,765.00	R18,594.00	R15,364.00	
9	Self-help	R22,698.00	R21,654.00	R17,985.00	R10,874.00	R9,578.00	
10	Biography	R27,894.00	R24,605.00	R22,654.00	R22,983.00	R23,549.00	
11							

Step 2: Select the *Insert* tab.



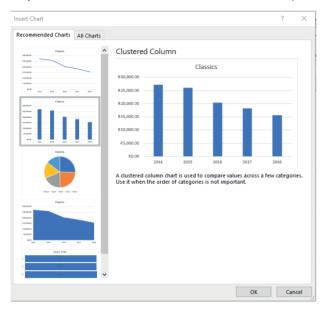
Step 3: Select Recommended Charts.

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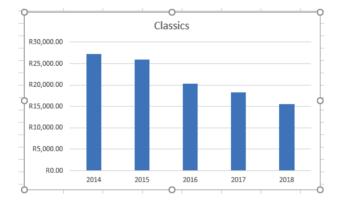
Step 4: Select a chart on the *Recommended Charts* tab to preview the chart.



Step 5: Select the chart that will work best for the data.

Step 6: Select OK.

The chart or graph will be added to the Excel spreadsheet. You can then move the chart around, resize it or edit it.



2

Activity 9.5

- 1. Open *Act9.5(Species).xlsx* and work in the *Spec* worksheet.
 - **a.** Create a pie chart in a new worksheet called Pie Chart to display the severity percentages for all Vertebrates (Column A).
 - Add the title "% of Endangered Vertebrates" roughly in the middle of the chart.
 - Add the legend at the bottom.
 - You must use data labels for each piece of the pie chart.
 - The "Birds" section must be separated from the rest of the pie.
 - **b.** Create a column graph in a new worksheet called Column Chart to display the number of threatened species per year (2008 2014) for all Invertebrates (Column A).
 - Add an appropriate title to the chart.
 - Add the legend at the top.
 - You must use data labels for the chart.

FORMATTING AND EDITING CHARTS AND GRAPHS

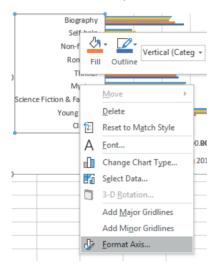
When it comes to finally displaying the data, there are many formatting options you can choose from to make sure the data is displaying in a way that gets the message across in the most effective way. There are two main ways that you can format a chart:

- Using the Format task pane.
- Using the Chart Tools ribbon.

The Format pane allows you to format the data display elements of the chart, like the axes, the data series, the title, etc. The Chart Tools ribbon allows you to format the colour, shapes and text.

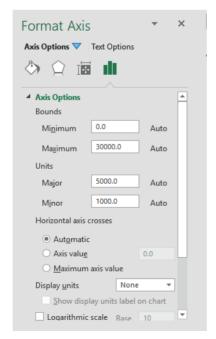


Step 1: Right-click on the chart element you want to format. This could be the axes, data series or titles, for example.



Step 2: Select Format [chart element]. In this case, it's the axis.

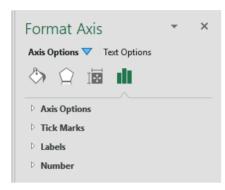
Step 3: The Format pane opens on the right of the screen with options for the element.



... continued



Step 4: Using this window, you can change the label position of the axes, change the number format, add tick marks to the axes or adjust the axes themselves.



In the Format pane, you can format the chart element using the following tools:

- Fill & Line lets you change the fill colour and border type for each element.
- Effects lets you add image effects (like shadows or a glow) to the element.
- Size & Properties lets you change the width, height and scale of the element as well as assign it certain properties.

You can change the chart's layout, style and chart type as well as adding shapes and text effects to the chart using the *Chart Tools* ribbon. There are several things that you can format using the ribbon. On the *Design* tab, you can:

- Add new chart elements.
- Change the layout using Quick Layout.
- · Change the colours and styles.
- Use the Data group, you can switch the rows and columns and change the data range.
- Change the chart type and move the chart to another sheet or tab in the workbook.



Figure 9.1: The Design tab of the Chart Tools ribbon

Using the Format tab, you can:

- Format the element you have selected.
- Insert shapes and change the styles of those shapes.
- Add WordArt and change the styles.
- Rearrange the chart's position in the spreadsheet.
- · Change the size of the chart.



Figure 9.2: The Format tab of the Chart Tools ribbon

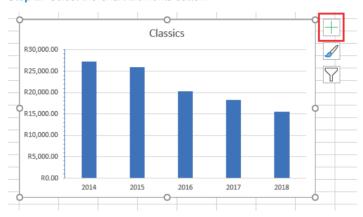
You can also add or remove gridlines, legends, data labels, titles and other options by using the *Chart Elements* button.

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Guided activity 9.9

Step 1: Select the chart.

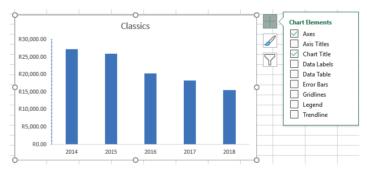
Step 2: Select the Chart Elements button.



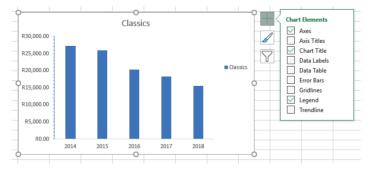
Step 3: Tick or untick elements you want to add or remove from the chart.



Step 4: Remove the gridlines from a chart by unticking the Gridline box.



Step 5: Add a legend to the chart by ticking the *Legend* box.



Legends are useful when you have more than one bar or data element in a chart since they let you reference the chart more easily.

GIVING CHARTS AND GRAPHS MEANINGFUL TITLES AND LABELS

The most important thing to think about when creating a chart is that the chart should give the reader all the information they need to quickly and easily interpret the data without them needing to interact with the data in any way.

This is why you need to make sure that the chart's titles and labels are meaningful and carry the appropriate message across. When you create a chart, think carefully what you will call the chart. It's not enough to call it "Marks" when the chart is actually showing different English class marks. Rather call it "Term 3 English Marks" to convey the appropriate and relevant message.

Naming the axes is also important, since people need to know that they are looking at. If you just have rows and columns of numbers without explaining them, the people looking at the chart might not be able to interpret it correctly. For example, if the y-axis (the line on the left going up) shows how many people attended an event, call that axis "Attendance". If the x-axis (the flat line on the bottom) shows dates for the event, call that axis "Event dates".

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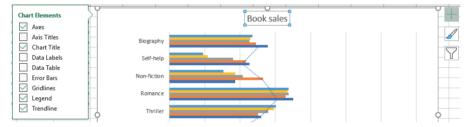
Guided activity 9.10

There are two ways to add chart titles and labels.

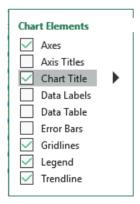
Method 1: Adding a title directly

Step 1: In the chart, select the Chart Title box and type in a title.

Step 2: Select the *Chart Elements* button.



Step 3: Select the arrow next to Chart Title.



Step 4: Select *Centered Overlay* to lay the title over the chart or use *More Options* to get extra choices.



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TERM 3 | CHAPTER 9 IF FUNCTIONS AND CHARTS | UNIT 9.3 Charts

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Guided activity 9.10

... continued

Step 5: Right-click the chart title to get options like *Fill* or *Outline* to format the chart.

Method 2: Linking a title to a cell

Step 1: In the chart, select the *Chart Title* box.

Step 2: Type = and select the cell that contains the text you want to use as a chart title.

Step 3: Press Enter.

EDITING CHARTS AND GRAPHS

Editing charts is actually very simple as long as you remember that whatever you do to the data, you do to the chart. This means that if you make a change to the source data that the chart draws from, the chart will update automatically to reflect that.

There are three main things you can edit in a chart:

- The data itself
- 2. The data series
- 3. The titles

In this section, you will learn how to edit the titles and data series of the chart. If you have any titles (like a chart or axis title) or labels (specifically data labels) in the chart, you can edit them in the chart itself. You can also use rich text formatting to make changes to the titles and labels, by adding colour, text effects and more.

Note that if you have linked the chart title or label to a cell in the worksheet, you will make the changes in that cell.



Guided activity 9.11

Step 1: To edit:

- A title, select the chart or axis title that you want to change.
- A data label, click twice on the data label that you want to change.
- (The first click selects the data labels for the whole data series, and the second click selects the individual data label.)
- **Step 2:** Click again to put the title or label in editing mode.
- **Step 3:** Select the text that you want to change and type the new text or value.
- **Step 4:** When you are finished editing, click outside of the text box where you have made text changes.



Guided activity 9.12

Step 1: Right-click on the chart, and then choose Select Data.



You can also get to this dialog box from the Value tab in the Chart Filters gallery.

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REVISION ACTIVITY

Ace Travel has stored a list of their clients in a spreadsheet.

Open the Chapter 9 Revision Activity spreadsheet and work in the Clients Kliënte worksheet.

- **1** Format the worksheet as follows:
 - a. Centre the text in row 1.
 - **b.** Use a light blue fill colour for row 1. (1)
 - **c.** Change the height of row 1 to 30pt. (1)
 - **d.** Wrap the contents of cell A3. (1)
- Use conditional formatting on column E to automatically highlight all males in a yellow fill
 colour and red text colour.
- 3. Insert a function in cell K8 to determine the total number of trips made by clients. (2)
- 4. Insert a function in cell K9 to determine how many clients are NOT international travellers. (3)
- **5.** Create a pie chart to display the percentage breakdown of each category of traveller status. Use the data in cells J11:K13 to create the chart as follows:
 - Add the following chart title above the chart (bold & 14pt): Traveller Status
 - Display the percentage for each category of traveller status.
 - Fill the category that has the highest percentage with any gradient colour of your choice.
 - Display the chart in a new worksheet and rename it to: Travellers (8) Work in the Bookings_Besprekings worksheet.
- **6.** The rate per day is stored in column H.
 - Insert a formula in cell D5 to determine the total accommodation cost for the duration of the stay for Bertha Hood. (2)
- 7. Insert a function in cell J7 to determine the third lowest rate per day. (2)
- 8. Insert a function in cell J10 to determine the total number of days (column C) that clients will spend at hotels or lodges in Kenya.
- 9. A booking reference in column A that is indicated with an 'X' indicates an international hotel or lodge. A booking reference that is indicated with a 'D' indicates a domestic hotel or lodge. Insert a function in cell E10 to return the value 'TRUE' if the hotel or lodge in row 10 is international and the value 'FALSE' if the hotel or lodge in row 10 is domestic.

Total: [32]

(1)

AT THE END OF THE CHAPTER

	CAN YOU	YES	NO
1	Use simple IF functions to solve problems?		
2	Use SUMIF and COUNTIF?		
3	Describe the use of relational operators in simple IF statements?		
4	Create and interpret charts and graphs in Excel?		
5	Format and edit charts and graphs in Excel?		
6	Embed charts and graphs into Microsoft Word?		

TERM 3 | CHAPTER 9 IF FUNCTIONS AND CHARTS | UNIT 9.3 Charts



CHAPTER 10

WORKING WITH SPREADSHEETS

CHAPTER OVERVIEW

Unit 10.1: Import/export data

Unit 10.2: Help files

Unit 10.3: Manipulating worksheets

Unit 10.4: Integration techniques

By the end of this chapter, you will be able to:



- Export data from Excel into various formats.
- Manipulate spreadsheet data, including moving and copying data, adding headings, freezing panes and viewing gridlines.
- Protect a spreadsheet using Excel's built-in tools.
- Use different print options, including print area.
- Link cells and formulas between sheets.

INTRODUCTION

Excel's ability to take large sets of data and perform complex calculations on it has made it one of the most popular spreadsheet programs in the world. This popularity is also due to the fact that Excel makes it easy for users to import data from other sources and to manipulate that data so that it makes sense.

WORKING WITH EXCEL

You can make a workbook easier to read and more presentable by inserting headers and footers. A header is found in the top margin and the footer is found in the bottom margin.

To insert a header or footer:

- Navigate to the bottom right hand side of the workbook. Select the *Page Layout* view command. The worksheet will then be shown in the *Page Layout* view.
- Select the header or footer that you want to format. In this example we will modify the header at the top of the page.

• The *Header & Footer* tools tab will appear in the Excel ribbon. From here, you can add page numbers, dates, workbook names and so on.

The header will change and then automatically add page numbers.

You may also need to format or update the data type of a particular cell. To do this, you will:

- 1. Select the cell or cells that you want to modify.
- 2. Select the drop-down arrow in the *Numbers* group on the *Home* tab.
- 3. A dialogue box will open; from there you can select the data type that you want.
- 4. Lastly, select OK and the data type will be applied to the selected cells.

TERM 3 | CHAPTER 10 WORKING WITH SPREADSHEETS

10.1 Import/Export data

Not all the data you will work with in Excel will be in Excel to begin with. You may need to import data from an external source into Excel in order to work with it properly. You may also need to export the data from Excel to another program so that you can share it with people who may not have access to Microsoft's Office products.

In this unit, you will learn how to import data from an Access database, a CSV file and from another Excel workbook. You will also learn how to export Excel data to a CSV file.

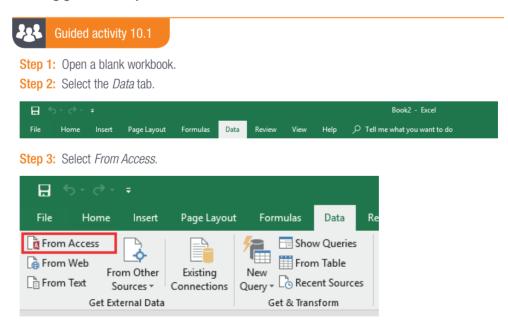
IMPORTING DATA

Imagine for a moment that you have been given a Notepad file containing rows and rows of data that needs to be input in Excel so that it can be sorted and analysed. If you were to try doing this manually, it could take days to do and you may make mistakes or leave something out. Luckily, Excel's import function will allow you to quickly import the data without any mistakes.

In your future careers, you may need to analyse data from a variety of sources, a Microsoft Access Database, a text file or a SQL file, for example.

IMPORTING DATA FROM ACCESS

When you are importing data from Access, you may need to take information from more than one table. Excel allows you to select the tables in an Access database when you are importing the data. To see how to import data from Access to Excel, read through the following guided activity.

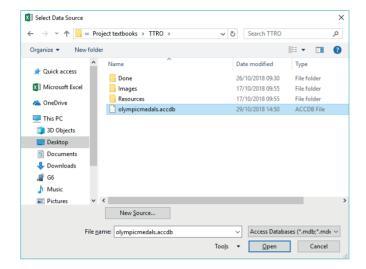


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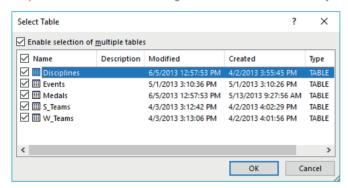
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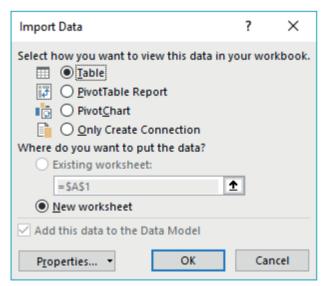
Step 4: Select the Access file you would like to import data from and select Open. Access files end in *.accdb.



Step 5: Use the *Select Table* dialogue box to choose which tables you want to import.



Step 6: Choose how you want to view the data in the Import Data window. In this example, we selected Table.



Step 7: Select OK and wait for the data to be loaded. This may take a few seconds, depending on the size of the database.

... continued

TERM 3 | CHAPTER 10 WORKING WITH SPREADSHEETS | UNIT 10.1 Import/Export data

Something to know If you want to select more

than one table, make sure

Enable selection of multiple

tables is checked.

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Step 8: As you can see, the data has been imported as tables on separate worksheets.

_		-	-
1	Discipline <u></u>	DisciplineID 💌	SportID 🔻
2	Alpine Skiing	D1	S37
3	Biathlon	D10	S8
4	BMX	D11	S15
5	Bobsleigh	D12	S9
6	Boxing	D13	S10
7	Canoe / Kayak F	D14	S11
8	Canoe / Kayak S	D15	S11
9	Cricket	D16	S12
10	Croquet	D17	S13
11	Cross Country S	D18	S37
12	Curling	D19	S14
13	Archery	D2	S2
14	Cycling Road	D20	S15
15	Cycling Track	D21	S15
16	Diving	D22	S1
17	Dressage	D23	S16
18	Eventing	D24	S16
19	Fencing	D25	S17
20	Figure skating	D26	S36
21	Football	D28	S18
22	Golf	D29	S19
23	Artistic G.	D3	S20
	← → She	et1 Sheet2	Sheet3

Step 9: The data is now imported and ready for you to work with.

IMPORTING DATA FROM A TEXT FILE

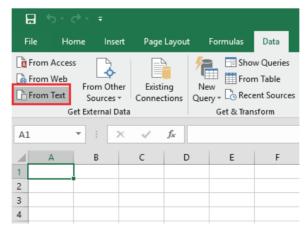
Very often, data that you download or extract from websites or online databases will be in a text file (*.txt). Reading this data in that file can be extremely difficult and it may be nearly impossible to analyse it or draw any conclusions from the data.

In the following guided activity, you will see how data from a text file can be imported into Excel.





Step 3: Select *From Text*.



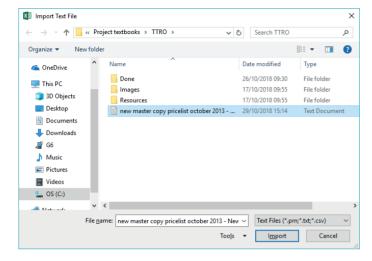
... continued

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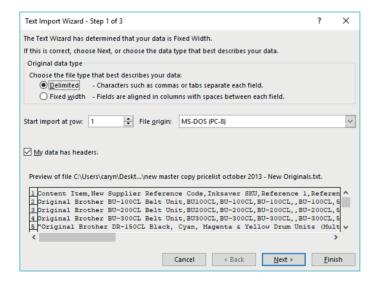
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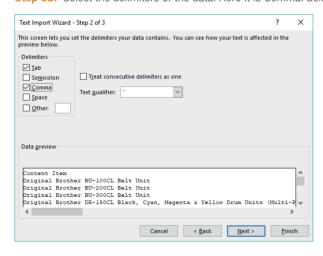
Step 4: Select the text file, Import.txt, to import data from and select Import. Text files end in *.txt



Step 5: Use the *Text Import Wizard* to select the format that best describes the data.Step 5a: In this case, we selected *Comma Delimited* and made sure that *My data has headers* has been ticked. Select *Next*.



Step 5b: Select the delimiters of the data. Here it is *Comma*. Select *Next*.

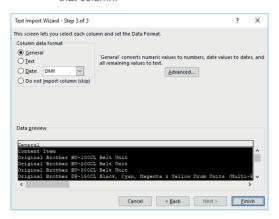


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TERM 3 | CHAPTER 10 WORKING WITH SPREADSHEETS | UNIT 10.1 Import/Export data

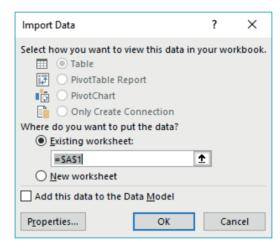


Step 5c: Select the format for the data. You can select each column and choose the *Data Format* for that column.



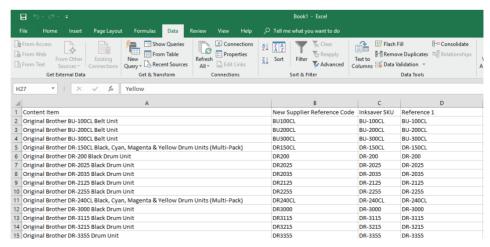
Once you are done, select Finish.

Step 6: The *Import Data* dialogue box will open. Select how you want to view the data. In this case, *Table* was automatically selected. You can also choose where you want the data to start in the worksheet. We chose cell A1.



Select OK when you are done.

Step 7: Check that the data has imported correctly and that the columns are correct.



Step 8: The data is now imported and ready to work with.

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You can also simply copy and paste the data from one workbook to another. Once you have all the data you need in one place, you can compare the data or create relationships between the data in one sheet and the data in another sheet.

EXPORTING DATA

When you have finished manipulating the data in Excel, you may need to export it to a different file format. This could be because you want to upload it to a SQL database, and you need it to be a comma separated values (CSV) file or the people you are sharing the data with do not have access to Excel.

The simplest way to export data to a different file format is to use the *Save As* function and change the file to a CSV.

EXPORTING TO CSV

To export the data in an Excel spreadsheet to CSV, you simply need to use the Save As function.



Step 1: Select File.



Step 2: Select Save As.



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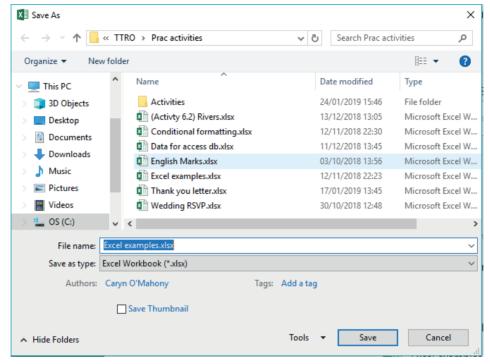
TERM 3 | CHAPTER 10 WORKING WITH SPREADSHEETS | UNIT 10.1 Import/Export data

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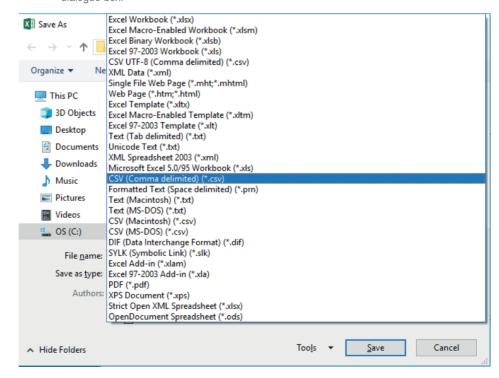


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Step 3: Select the location you want to save the file to.



Step 4: Select *CSV (Comma delimited) (*.csv)* from the *Save as type* dropdown menu in the *Save As* dialogue box.



... continued

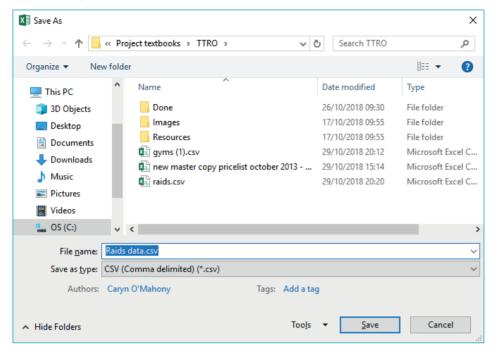
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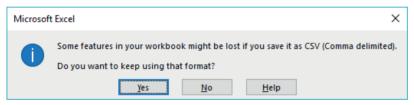


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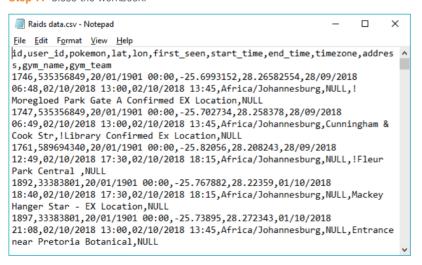
Step 5: Change the name from Book1 to the document's new name and select Save.



Step 6: Select Yes in the message box that pops up.



Step 7: Close the workbook.





Open Act10.1(Species).xlsx.

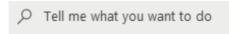
- 1. Import the data from *Act10.1(Imp).csv* into the worksheet *Imp*.
- 2. Save and close the spreadsheet.

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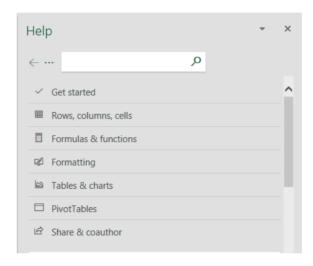
10.2 Help files

To access help in Microsoft Excel, you can do any of the following four things:

1. Enter a query in the box labelled *Tell me what you want to do* at the end of the tabs at the top of the document.



2. Press F1 on the keyboard to enter the Help panel on the right-hand side of the document.



3. Select File and then select the ? in the top right-hand corner.



4. Select the Help tab.

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10.3 Manipulating worksheets

Knowing how to manipulate the data in the worksheets correctly is an essential skill when working with Microsoft Excel. If you do not move the data correctly, this could lead to errors in the results or the formulas not working correctly.

In this unit, you will learn how to work with Excel spreadsheets and how to move and copy data, how to add headings and freeze panes, how to view gridlines and how to protect the spreadsheet. You will also learn about different print options available to you when you want to print it.

WORKING WITH SHEETS

When you move or copy a cell, Excel will keep that cell's formulas and the results, the formatting and any comments.

MOVING AND COPYING DATA

If you only want the resulting values of a formula to be moved.

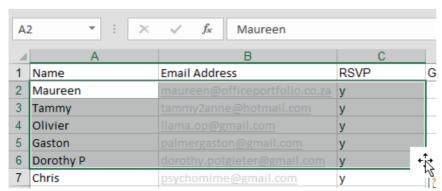
You can drag and drop cell data to move data.



Step 1: Select the cells you want to move.

A	A2 • : X					
4	Α	В	С			
1	Name	Email Address	RSVP	G		
2	Maureen	maureen@officeportfolio.co.za	у	Γ		
3	Tammy		у			
4	Olivier		у			
5	Gaston		у			
6	Dorothy P	dorothy.potgieter@gmail.com	у			
7	Chris	psychomime@gmail.com	У	4		

Step 2: Move the mouse cursor to the border of the selection and wait for it to become the move pointer.



... continued

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Step 3: Drag the selection to another part of the worksheet.



Another option for moving data is to use the Cut and Paste commands.

Sometimes, you might have to copy the results of a formula without copying the formula itself. Remember that when Excel copies a cell it copies all of the data in that cell. To copy just the values to a new area, you will need to use the *Paste Special* feature in in Excel.

Paste Special in Excel has more options than in Microsoft Word. In the example below, you will learn how to use the most commonly used option, pasting values only.



Guided activity 10.5

Step 1: Select the data you want to copy. As you can see, there are functions in these cells.

f_x	=IF(B2>=1000, "No", "Yes")			
	С	D	Е	
	Shipping?	Total		
10.00	No	R0.00		
0.00	Yes	R350.00		
10.00	No	R0.00		
8.00	Yes	R1,098.00		
10.00	No	R0.00		
10.00	Yes	R700.00		
10.00	No	R0.00		
1.00	No	R0.00		
0.00	Yes	R250.00		
i0.00	No	R0.00		
10.00	No	R0.00		
10.00	Yes	R300.00		

Step 2: Copy the data using the *Copy* command in the *Home* ribbon or by pressing Ctrl+C.



... continued

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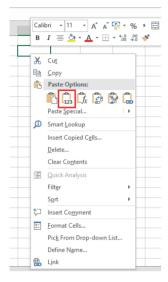
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... continued

Step 3: Right-click in the cell you want to move the data to. An *Options* dialogue box will open.

Step 4: Select the Paste Values icon.



Step 5: The data will be pasted as values only. As you can see, when the data is selected, the functions have been removed.

No				
С	D	Е	F	G
Shipping?	Total			
No	R0.00		No	0
Yes	R350.00		Yes	350
No	R0.00		No	0
Yes	R1,098.00		Yes	1098
No	R0.00		No	0
Yes	R700.00		Yes	700
No	R0.00		No	0
No	R0.00		No	0
Yes	R250.00		Yes	250
No	R0.00		No	0
No	R0.00		No	0
Yes	R300.00		Yes	300

There are many other moving and copying options available in Excel. To find out more, visit the Microsoft Support website by scanning the QR code on the right.

VIEWING GRIDLINES AND FREEZING PANES

Often, the way the data is displayed can make it easier or harder to read. This is especially true when you have many rows of data that you need to scroll down to see and the title rows disappear.

You can change the way the gridlines are displayed on a worksheet and you can also freeze certain panes in a worksheet to make scrolling through the sheet easier.



Guided activity 10.6

Excel has the gridlines in every workbook on by default. To turn the gridlines on and off, you can do the following:

Step 1: Go to the View tab.

Step 2: Tick or untick the *Gridlines* box in the *Show* group.



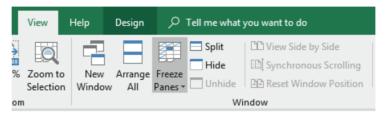
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When you have a lot of data in a workbook and do not want to lose track of what each column or row contains, you can freeze certain parts of the document so that they stay in place while you scroll. You can choose to freeze the top row of data, the first column of data or rows and columns of your choice. To do this, follow the steps below.



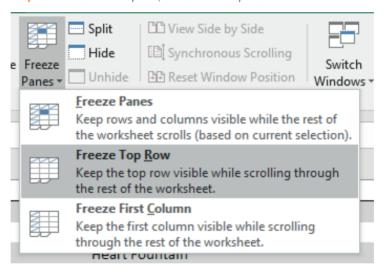
Step 1: Select the View tab.

Step 2: Select Freeze Panes in the Window group.

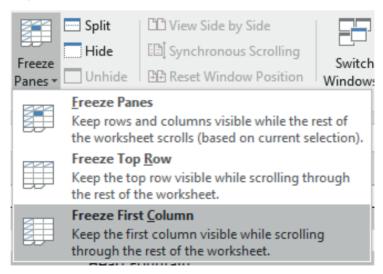


Step 3: Select the type of pane you want to freeze.

Step 3a: To freeze the top row, select *Freeze Top Row*.



Step 3b: To freeze the first column, select *Freeze First Column*.



... continued

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... continued

Step 3c: To freeze a selection of rows:

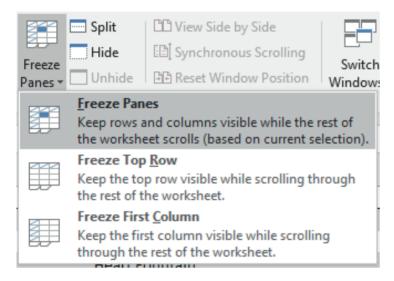
Select the row directly below the one you want to freeze.

Select Freeze Panes.

To freeze a selection of columns:

Select the column directly after the one you want to freeze.

Select Freeze Panes.

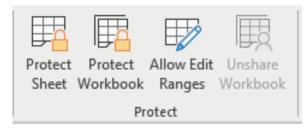


PROTECTING THE WORKBOOK

If you are going to be sharing the Excel workbooks with other users, you may want to stop those users from making changes. Protecting the workbook means preventing others from viewing hidden worksheets, adding, moving, deleting, or hiding worksheets and renaming worksheets by setting up a password. You can also lock specific cells in a spreadsheet.



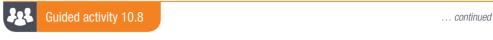
Step 1: Select the *Review* tab.Step 2: Select *Protect Workbook*.



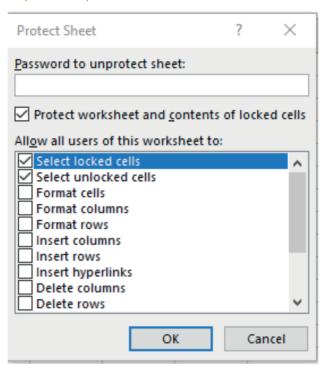
... continued

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Step 3: Enter a password in the *Password* box.



- **Step 4:** Tick the boxes to allow users to do certain things. If you want to make the spreadsheet read-only, untick all the boxes.
- Step 5: Select OK. Retype the password and select OK again.

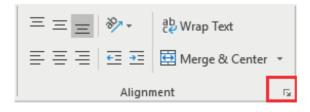
Guided activity 10.9

Step 1: Open the file GA 10_9.xlsx.

Step 2: Select the cells you want to protect.

	А	В	С	D	E	F
1	Genre	2014	2015	2016	2017	2018
2	Classics	R27,228.00	R25,984.00	R20,346.00	R18,223.00	R15,547.00
3	Young Adult	R30,056.00	R32,128.00	R36,987.00	R42,694.00	R65,321.00
4	Science Fiction & Fantasy	R9,150.00	R8,561.00	R8,498.00	R9,589.00	R8,924.00
5	Mystery	R25,667.00	R25,432.00	R27,629.00	R27,978.00	R28,456.00
6	Thriller	R25,945.00	R25,165.00	R28,078.00	R29,656.00	R30,215.00
7	Romance	R35,065.00	R32,973.00	R33,756.00	R33,561.00	R33,798.00
8	Non-fiction	R18,655.00	R26,563.00	R20,765.00	R18,594.00	R15,364.00
9	Self-help	R22,698.00	R21,654.00	R17,985.00	R10,874.00	R9,578.00
10	Biography	R27,894.00	R24,605.00	R22,654.00	R22,983.00	R23,549.00
11		# =				

Step 3: Select the arrow next to *Alignment* on the *Home* tab to open the *Format Cells* dialogue box.



... continued

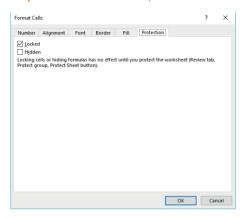
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... continued

Step 4: In the *Protection* tab, tick the *Locked* check box and then select *OK*.



Step 5: Protect the worksheet or workbook.

PRINT OPTIONS

If you need to print an Excel spreadsheet, there are various options you can choose from. For example, you can choose to print the entire workbook, just a single sheet or a selection. Table 10.1 explains the different print options.

Table 10.1: Excel print options

PRINT OPTION	DESCRIPTION
Print Active Sheets	Print only the sheet(s) that you have selected to print.
Print Entire Workbook	Prints all the sheets containing data in a workbook.
Print Selection	Prints only the cells, rows or columns you have selected.

You can also manipulate the layout of a worksheet to make the data easier to read when printed and to save paper. For example, if you have a lot of data on a single worksheet, you can choose how the data will be printed to use fewer pages by:

- Changing the orientation. Landscape orientation, which means the page has the long edge on the top and bottom, can fit more data on a line.
- Changing how many columns are on a printed page. You can do this using the scaling options in the *Print* menu.

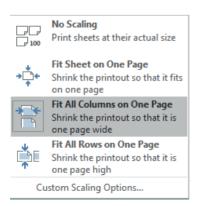


Figure 10.1: Excel scaling options



- Setting the width of the margins. Narrower margins mean that there is more space in the main body of the page for the data to fit on to.
- Use Scaling, fit to one page in Page Setup.
- Drag the page break lines as you please in the Page Break View.

You can find out more about all the printing options in Excel on Microsoft's support site.



Activity 10.2

Open Act10.2(Rivers).xlsx

- 1. Work in *Rivers* sheet.
 - a. Protect columns A-C to stop users from entering text.
 - b. Use 1234 as a password.
- 2. Work in the *Rivers* sheet.
 - **a.** Change the page layout to ensure that all the data will fit on one page without adjusting the font size and column widths.
- 3. Save and close the workbook.

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10.4 Integration techniques

Excel is ideally suited to be used with other programs since you can use Excel to create graphs or charts from the data to enhance the Word or PowerPoint documents or to manipulate and check the data before you upload it to an Access database.

Excel is also able to integrate with itself, since you can link cells and formulas to other spreadsheets in the same workbook and have the data in one spreadsheet influence the data in another.

In this unit, the different Excel integration techniques will be described as well as how Excel can be used for problem solving.

LINKING CELLS AND FORMULAS BETWEEN SHEETS

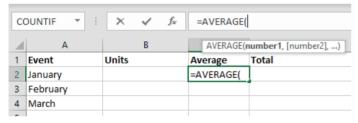
Very often, you will want to draw conclusions from a large set of data that is in the same workbook. Instead of manually calculating the data you have, you can link the cells across worksheets so that each worksheet's data can affect the data in other sheets.

This may sound complicated but look at the following guided activity to see how you can link cells and why you would need to.

Guided activity 10.10

Step 1: Select the cell you want to add the function to.

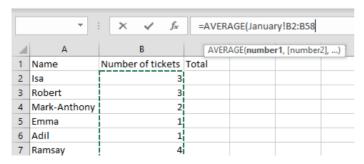
Step 2: Start by typing "=" and then the function's name in the formula bar, in this case we're using AVERAGE.



Step 3: Select the tab of the worksheet you want to reference.

22	Chantelle		1			
22	Daul					
	\longleftrightarrow	Tickets totals	January	Beldum Day	Cyndaquil Day	

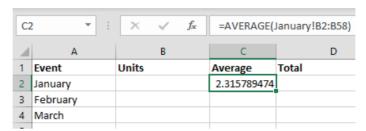
Step 4: Select the range of cells or the single cell you want to reference. Note that the sheet name is followed by an exclamation mark (!).



... continued

... continued

Step 5: Close the bracket and press *Enter*. Go back to the first sheet to see the result.



You can type the information in Steps 3 and 4 manually if you know the exact range of cells or cell you want to reference.



Activity 10.3

A local Pokémon GO! community group has been hosting their special events at a nearby zoo. They sell tickets for R45. They have captured data for each of the events they sold online tickets for.

They want to see how many tickets they have sold on average since the first event, how much money they made at each event and which event had the highest number of ticket sales.

Open the spreadsheet Act10.3(Sales data).xlsx and calculate the following:

- 1. In column C of each sheet (Chikorita Day, Beldum Day and Cyndaquil Day) calculate how much each person paid for their tickets for each event.
- 2. Calculate the total number of tickets sold and the total sales for each event. This will be done in:
 - Cells B59 and C59 respectively for Chikorita Day
 - Cells B74 and C74 respectively for *Beldum Day*
 - Cells B39 and C39 respectively for Cyndaguil Day
- 3. On the sheet called *Ticket totals*, calculate for each event
 - the number of tickets sold (B2:B4)
 - the average number of tickets sold (C2:C4)
 - The average sales (D2:D4); by linking the calculations for each event to their respective cells on the sheet *Ticket totals*.

REVISION ACTIVITY

Open the *Chapter 10_Revision Activity* spreadsheet. The details of the blood donors at the school are stored in this spreadsheet. Work in the DonorsInfo worksheet.

- 1. Format the headings in A1:G1 with a red fill and the font colour to be white.
- 2. Change the format of the heading in cell I2 to resemble the image below:



3. Change the font of rows 1 & 2 to Comic Sans MS.

- (1)
- **4.** Apply a suitable formatting in column H so that all cells with donors who weights below 60KG are displayed with a light blue fill.
- (3)

(2)

(2)

(2)

5. Use a suitable formatting in row 1 and 2 to lock the headings so that they are kept visible when you scroll through the rest of the worksheet.

... continued

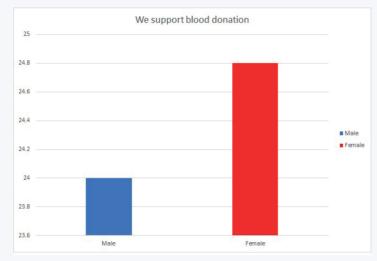
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REVISION ACTIVITY ... continued

6. Learners that donate more than 30 litres of blood are seen as "Peer Promoters" and those less than 30 litres seen as "Beginners". The words "Peer Promoter" and "Beginner" should appear in column F based on the litres of blood donated in column I. In cell F26, use a function to determine category for Liyema Frans. Work in the Save-a-ton worksheet.

- 7. General statistics are normally needed of the learners that are taking part in the Save-a-Ton.
 - a. In cell I5, use a function to calculate the number of girls that took part. (2)
 - b. In cell I6 insert a function to determine the number of male adults. (2)
- 8. Use the totals for the Male and Female in J1:K2 to create a graph similar to the one below.



NOTE:

- The graph must be a column chart.
- Display a centred overlay chart title: "We support Blood Donation".
- Format the column for female to a stack filled with a picture Droplets.jpg.
- The vertical axis must have a rotated title that reads "Number of Adults".
- Legend must be displayed on the left side.
- Data labels must be displayed inside base.

(8)

(3)

- Move the chart/graph to a new worksheet within the existing spreadsheet. Rename the new sheet "Chart".
- Work in the Import worksheet.
- 10. Import the data from the Import.txt file into the Import worksheet.

(3)

(2)

Total: [30]

AT THE END OF THE CHAPTER

	CAN YOU	YES	NO
1	Import data into a spreadsheet from various sources?		
2	2 Export data from a spreadsheet into various formats?		
3	Manipulate spreadsheet data, including moving and copying data, adding headings, freezing panes and viewing gridlines?		
4	4 Protect a spreadsheet using a spreadsheet's built-in tools?		
5	5 Use different print options, including print area?		
6	Link cells and formulas between sheets?		

TERM 3 | CHAPTER 10 WORKING WITH SPREADSHEETS | UNIT 10.4 Integration techniques



CHAPTER OVERVIEW Unit 11.1: Templates Unit 11.2: Integration with other packages Unit 11.3: Problem solving Unit 11.4: Troubleshooting By the end of this chapter, you will be able to: Insert a header or footer. Create templates and save workbooks as templates.

- Integrate spreadsheet with other packages, such as linking charts and graphs.
- Plan and design your own documents for specific scenarios or enquiries.
- Solve problems using spreadsheets.
- Troubleshoot spreadsheets and find and view Help files in Excel.

INTRODUCTION

A spreadsheet application's ability to take large sets of data and perform complex calculations on it has made it one of the most popular spreadsheet programs in the world. This popularity is also due to the fact that Excel makes it easy for users to import data from other sources and to manipulate that data so that it makes sense.

RECAPPING HEADERS AND FOOTERS AS WELL AS DATA TYPES

You can make a workbook easier to read and more presentable by inserting headers and footers. A header is found in the top margin and the footer is found in the bottom margin.

To insert a header or footer:

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- Navigate to the bottom right hand side of the workbook. Select the *Page Layout* view command. The worksheet will then be shown in the *Page Layout* view.
- Select the header or footer that you want to format. In this example we will modify the header at the top of the page.

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• The *Header & Footer* tools tab will appear in the Excel ribbon. From here, you can add page numbers, dates, workbook names and so on.

The header will change and then automatically add page numbers.

You may also need to format or update the data type of a particular cell (for example, dates, currency and text). To do this, you will:

- Select the cell or cells that you want to modify.
- Select the drop-down arrow in the Numbers group on the Home tab.
- A dialogue box will open; from there you can select the data type that you want.
- Lastly, select OK and the data type will be applied to the selected cells.

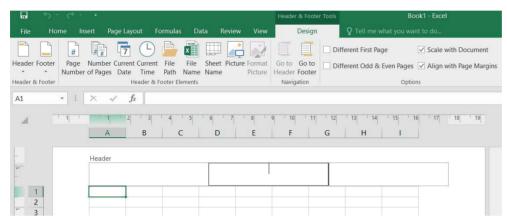


Figure 11.1: Recapping headers and footers

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11.1 Templates

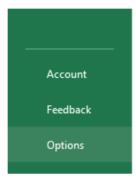
It is easy to create a template from a workbook you use often (like a stocktake sheet or a products list with specific formulas). When you have created a template remember that the template is always there to use over and over again, the spreadsheet you save after you have added the data to the template, is saved with a new file name and can be saved in a different location.



Guided Activity 11

If you are saving a workbook to a template for the first time you need to start by setting the default personal templates location:

Step 1: Select File and then select Options.



Step 2: Select Save.



Under *Save workbooks*, enter the path to the personal templates' location in the Default personal templates location box. This path is typically: C:\Users\[UserName]\Documents\Custom Office Templates.

Save to Computer by default	
Default local file location:	
Default personal <u>t</u> emplates location:	C:\Users\[UserName]\Documents\Custom Office Templates

Step 3: Select OK.

... continued

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Guided Activity 11.1

... continued

Once this option is set, all custom templates you save to the *My Templates* folder automatically appear under *Personal* on the *New* page (File > New).

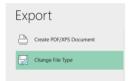
To save as a Template:

Step 1: Open the workbook you want to use as a template.

Step 2: Select File and then select Export.



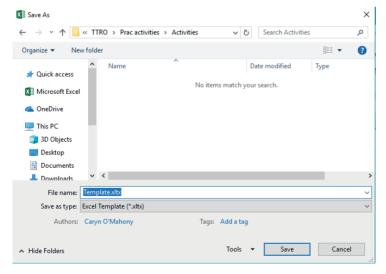
Step 3: Under Export, select Change File Type.



Step 4: In the Workbook File Types box, double-click Template.



Step 5: In the File name box, type the name you want to use for the template.



Step 6: Select Save, and then close the template.

With the template you created above, you can create a new workbook. To use the template, simply follow the instructions in Example 5.11, but instead of searching for the template in Step 2, select Personal to view your own template.



- 1. Open a blank Excel document.
- 2. Add the following headings to cells A1-E1:
 - a. Item
 - b. Units
 - c. Unit price
 - d. Price
 - VAT
- 3. Add the following formula to cell D2: =C2*B2. The answer will be 0.
- **4.** Add the following formula to cell E2: =C2*1.15. The answer will be 0.
- **5**. Save the document as a template called *Stock-on-hand.xltx*.

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11.2 Integration with other packages

Excel integrates very well with other Microsoft Office products like Word and Access. In Word, you can link charts and graphs from Excel and update them in Word when you update them in Excel. You can also import Excel spreadsheets into a Word document.

To import charts and graphs in to Word, you have to link the object in the Word document. This creates a link between the two, so any changes you make in Excel will reflect in Word and you can edit the data in Word as a normal Word table and have the data update in Excel. The easiest way to insert an Excel chart into Word is to copy and paste it.

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Guided Activity 11.2

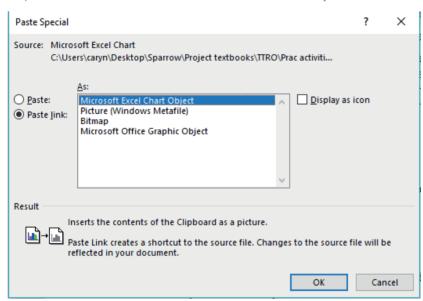
Step 1: In Excel, select the chart.

Step 2: Press Ctrl+C or select the Home tab and then select Copy.

Step 3: In a Word document, select where you want the chart to appear.

Step 4: Select Paste Special on the Home ribbon.

Step 5: Select Paste Link and also select Microsoft Excel Chart Object.



The chart will still be linked to the data in the Excel spreadsheet, so when you update the data in Excel, the chart will update in Word.



Activity 11.2

Open the workbook Act11.2(Pie chart).xlsx

- 1. Create a pie chart using the data in *Sheet 1*.
- 2. Insert the chart into the Word document, *Act11.2(Pie chart).docx*. Find the text [insert chart here]. (Remove the placeholder after the chart has been inserted.)
- 3. The chart should update automatically when the original data is changed.
- 4. Save and close both files.

11.3 Problem solving

When you use Excel to solve problems, you need to start with an end-goal in mind. Ask yourself what you want the data to show and how you will show it. Not all problems can be solved with the same formulas or functions.

Excel is a useful tool to use to solve real life problems. However, it can seem very overwhelming when you are looking at the problem and trying to figure out how to solve it using formulas and functions. At the end of this section, you will see that you do have the skills you need to get there.

All you need to solve problems is some planning, some basic Maths skills and an idea of how formulas and functions work. Example 6.13 will show you how you can go about solving a real-life problem with Excel.

Solving real-life problems with Excel

Julia wants to buy a car for herself after school before she goes to university. She knows she needs to save up but has no idea how much she must set aside each month. At the beginning of her Grade 11 year, her parents tell her that they will give her 50c for every R1 she saves towards her car.

She does some research and finds that the car she wants will cost her R150 000. She now needs to figure out how much money she will need to save (minus the money her parents will give her) in order to buy the car at the end of her Matric year.

To do this, she needs to break down each step so that she can create the correct formulas to help her.

- **Step 1:** First, she needs to work out how much she'll need to save each month over the next 24 months. She enters the cost of the car in cell A2.
- Step 2: She then uses the formula =A2/24 in cell B2 to work out how much money she potentially needs to save. This gives her R6 250
- Step 3: She knows she can only save R3 000 a month, so she needs to work out how much her parents will be willing to give her based on her savings. She puts the amount in cell C2 and then uses the formula = C2*0.5 in cell D2.

Her parents will give her R1 500 a month.

She knows that adding those two values together gives her R4 500. This is not enough to buy the car in two years. Julia now needs to rethink how long she has to save for.

As you can see by the example, Julia was able to work out that she would need to save for a bit longer to buy her car using simple Excel formulas.

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11.4 Troubleshooting

Sometimes, despite how careful you have been in entering data and putting formulas together, something may go wrong with the Excel spreadsheet. Often, it's something easy to fix, maybe you entered the wrong value somewhere so now the sum is not correct, and other times it may be quite difficult to figure out what exactly went wrong.

In this unit, you will learn how to troubleshoot basic Excel issues. You will also learn about Excel's help files and where to find them.

TROUBLESHOOTING SPREADSHEETS

Troubleshooting errors with formulas can be a big job, and Excel does give you tools to help you work through those errors (found in the *Formula Auditing* group in the *Formulas* tab), but you might not need to use such an advanced tool. Sometimes, all you will need is some knowledge of the problems you are looking at.

The error indicators you learned about earlier in this chapter and in Grade 10 are a valuable clue to help you spot what went wrong. If Excel cannot calculate a formula, it will give you an error specific to the problem. You should learn these errors, what they mean and how to correct them. This is often enough to make sure the spreadsheet works as it is supposed to.

If Excel gives you an error you are not familiar with or if something less obvious is wrong, you may need to try a different troubleshooting option. Table 11.1 gives you a list of troubleshooting tips.

Table 11.1: Troubleshooting tips

ERROR	DESCRIPTION	SOLUTION
Wrong result	The formula has returned an incorrect result according to the parameters you set.	Highlight the cell and use F9. Excel will evaluate the expression and give you a result in the formula bar. This allows you to see any errors in the logic of the expression.
Formula looks too simple	The data is complex but the formula in the Formula bar looks too simple.	Check that the formula does not contain multiple lines. Check that the right end of the Formula does not have an up/down arrow showing. Use the down arrow or Expand Formula Bar button to see the formula.
Incorrect value	The formula returned a date. instead of a number.	The formula is in a cell that is formatted as Date or Time. Change the cell formatting to Number or General to view the correct result.
Function returns the function	The formula you entered displays as the formula or function and not as a value.	Make sure the cell is not formatted as text and that there is nothing before the equals sign. Make sure you have used an equal sign at the start of the expression.

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EXCEL HELP FILES

Sometimes, even Excel experts need help. The Help function in Excel is a useful tool for finding out how to do something or for looking up the answer to a question you have. Just as in Word, there are three ways to access the help files in Excel:

- 1. Press F1 on the keyboard to open the Help pane.
- 2. Type the query into the box labelled Tell me what you want to do at the end of the tabs at the top of the document.
- 3. Select File and then the ? in the top right corner.



- 1. Open the Act11.3(Excel Help).xlsx file and use the Excel Help feature to answer the guestions/fix the errors in the functions.
 - 1.1 The guestion deals with the POWER function. Enter the correct function in cell E3.
 - **1.2** The question deals with the SMALL function. Enter the correct function in cell E6.
 - **1.3** The guestion deals with the ROUND function. Enter the correct function in cell E16.
 - 1.4 The guestion deals with the #VALUE error. Enter the correct function in cell E19.
 - 1.5 The question deals with the IF function. Enter the correct function in cell E25.

REVISION ACTIVITY

Open the Chapter 11 Revision Activity spreadsheet and complete the tasks below.

- 1. Format row 1 as follows:
 - Apply text wrapping to the headings in row 1.
 - Increase the font size of the text to 14.
 - Apply any gradient fill to cells A1:H1.
 - Freeze row 1 to make navigation easier of the worksheet. (4)
- 2. In cells B16-H16, use a function to track marks over the school year for each of the subjects.
- 3. In cells B17-H17, use a function to work out the average over the school year for each of the subjects. Round the average to one decimal place using the Round function.
- 4. Use conditional formatting to keep track of when the average for Life Orientation went up or down and when the mark was below or above the average. If the mark is below average the cell must appear with a light red fill and if the mark is above average the cell must appear with a yellow fill.
- 5. Insert a page header as follows:

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- Left section: Page Number
- Center section: Add your name and surname
- 6. You need to represent the averages of all the marks for each of the subjects visually.
- - Create a pie chart with the averages that you have determined in cells B17:H17.
 - Display the legend below the chart.
 - Add the following chart title above: 'AVG Year marks'
 - Data labels must be displayed outside end.
 - Move the chart to be displayed on a new sheet.
- Rename the sheet of the chart to: Avg Marks.

(1)

7. Save a copy of the workbook as a template in the Chapter 11 file.

Total: [33]

(8)

(7)

(7)

(3)

(3)

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AT THE END OF THE CHAPTER

	CAN YOU	YES	NO
1	Insert a header or footer?		
2	2 Create templates and save workbooks as templates?		
3	Integrate Excel with other packages, such as linking charts and graphs?		
4	Plan and design your own documents for specific scenarios or enquiries?		
5	Solve problems using spreadsheets?		
6	Troubleshoot spreadsheets and find and view Help files in Excel?		

TERM 3 | CHAPTER 11 TEMPLATES AND INTEGRATION | UNIT 11.4 Troubleshooting



CHAPTER 12

INTRODUCTION TO DATABASES

CHAPTER OVERVIEW

Unit 12.1: Basics of Access

Unit 12.2: Work with different views

Unit 12.3: Database structure

By the end of this chapter, you will be able to:

Discuss the uses of a database.

- Describe the role of tables, queries, forms and reports.
- Explain the difference between records and fields.
- Describe how field names determine the data type in each field.
- Define the different data types in an Access database.
- Describe the structure of a database.
- Create tables and forms in an Access database.
- Work with design and table views in Access.
- Format and edit data and tables in a database.

INTRODUCTION

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In the days before computers were as common and cheap as they are today, people would use filing cabinets to store their data. This could be the patient records a doctor kept or the records of every student who attended a particular school. The data in a filing cabinet would usually be a paper form that was either filled in by hand or typed and the data would be sorted into different drawers using a key piece of information, usually alphabetically by last name or using a unique number (such as a file number).

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Figure 12.1: A filing cabinet with files

Once computers became more available to the general public, these filing cabinets were slowly replaced with databases, which stored the same information in a digital format.

Databases are all around us, in ways we do not even think about. When you go to an ATM and put in a card, the information on the magnetic strip is stored on a database somewhere and the PIN is the unique key to enable access to the account data. In a restaurant, the point-of-sales system connects to a database that lists all the food items on the menu. At school, your marks and your classmates' marks are all stored on a database, ready for the term report to be drawn from that data.

Databases are incredibly important tools in our Information Age. Every transaction and action done by people and computers on the internet generates data that has to be stored, sorted, organised and analysed. Databases, from the small ones used by your school to the large ones used by companies like Google, are where this data is stored and used to generate meaningful ideas about the way people interact with the digital world.

DATABASES

In Grade 10, you learned about Excel and how you can use it to sort through and analyse data using spreadsheets, which are mainly used to perform calculations. A spreadsheet program allows you to store, organise and analyse information.

Access, a database application, uses tables in a way that you will recognise from your work with Excel, that is, to store and organise data.

In this chapter you will learn what databases can be used for, what tables, queries, forms and reports are and why they are essential to databases. You will also learn about records and field and how field names influence data. Data types and the structure of a database will also be explained.

You will be shown how to create a table and form in Microsoft Access, how to add and delete records and fields and how to validate and sort data. You will learn about how to use the Datasheet View and the Design View for different tasks in a database and the basics of formatting and editing data.

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12.1 Basics of Access

A database is a collection of a large amount of data, which is organised into files called tables. Tables give you a structured way to access, manage and update data.

DATABASE USES

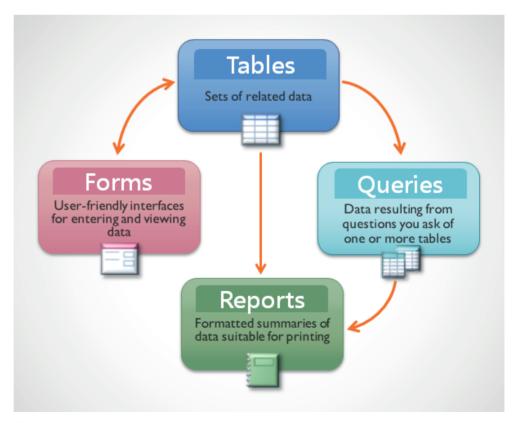
Databases are used in a wide range of fields. A doctor might use a database to store patient information, or a school might store the subjects and marks for each learner attending that school. Larger databases can store the information generated by a company's sales teams all around the country or the browsing habits of an entire city. Retail stores can use databases to store information on their products and link this information generated by the barcode scanners at each till point to track how much of each product it has at any given time. Databases are basically used anywhere that data needs to be stored and accessed easily.

TABLES, QUERIES, FORMS AND REPORTS

Databases in Access are made up of four objects:

- 1. tables
- 2. queries
- 3. forms
- 4. reports

Together, these objects allow you to enter, store, analyse and compile data however you want.



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Figure 12.2: The relationship between database objects

In a database, all data is stored in tables, which puts tables at the heart of any database. Like in Excel, the tables in Access are organised into vertical columns, called fields, and horizontal rows, called records.

TABLES	Although data is stored in tables, the other three objects (forms, queries and reports) are the ways you work with the data. Each of these objects interacts with the records stored in the database's tables.
FORMS	Forms are used for entering, modifying, and viewing records. Forms make entering data easier because they standardise the way data is entered or captured in the database. They are an easy way to guide people into giving you the correct data you need to enter into a database. When you use a form in Access, the data goes into the table you want it to go into.
	Database designers can set restrictions on individual form components to ensure all of the data is entered in the correct format. Forms help keep data consistent and organised, which is essential for an accurate and powerful database.
QUERIES	Queries are a way of searching for and pulling data from one or more tables. Running a query is like asking a detailed question to the database. When you build a query in Access, you are defining specific search conditions to find the exact data you want. Queries are far more powerful than the simple searches you might carry out in a table in Excel. A well-designed query can give information you might not be able to find just by looking through the data in tables.
REPORTS	Reports give you the ability to present data. A timetable or a report card are examples of reports. Reports are useful because they allow you to present components of a database in a way that is easy to read. You can customise a report's appearance to make it look attractive. Access offers you the ability to create a report from any table or query.

RECORDS, FIELDS AND FIELD NAMES

Fields and records make up the data in a table. As mentioned in the previous section, fields are the columns in the table and records are the rows. Each field will contain a single type of data, for example, a field marked *Name* will contain only names while a field marked *Telephone Number* would contain only telephone numbers. The type of data inside a field is always determined by the field's name.

Records, on the other hand, contain all the data in a single row of the table, so in a table called *Users*, a record will contain the entry's identifier (or ID), a username, full name, email address and password. All the cells in that row make up the whole record.

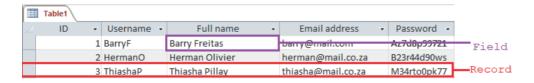


Figure 12.3: Fields and records in a database table

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DATA TYPES IN ACCESS

There are a number of different data types in Access that you will use. These are shown in Table 12.1.

Table 12.1: Data types in Access

DATA TYPE	PURPOSE	EXAMPLE
Text	Used to store up to 255 characters of text. Since Access 2013, this data type has been called Short Text.	Usernames are stored as Text in the field Username.
Number	Used to store numbers that are not a currency value. If the values in the field are needed for a calculation, use this data type.	In the field <i>Contact Number</i> , the users' telephone numbers are stored.
Date/Time	Used to store dates and times.	The date and time a user created a user profile is marked in the <i>Date</i> and <i>Time</i> fields.
Currency	Used to store monetary values. Currency values are not rounded off when doing calculations.	The <i>Users</i> table has a field marked <i>Donations</i> . The data type here notes the amount of money each user donated.
AutoNumber	An AutoNumber field is used to generate a unique value that serves no other purpose than making each record unique.	Each record begins with a <i>User ID</i> field. This field is an AutoNumber field that generates a unique user ID each time a new record is entered.
Yes/No	This is used to enter a Boolean value in the field.	This table records whether a user has signed up for the newsletter. If they have, the field entry is Yes. if they have not, the field entry is No.
Memo	A Memo field is used to store a block of text that is more than 255 characters long. Since Access 2013, this data type has been called Long Text.	The database also contains a field for a short thank you note. The data type used here is the Long Text.
Hyperlink	Text or combinations of text and numbers stored as text and used as a hyperlink address.	A hyperlink can be a UNC path or a URL. It can store up to 2048 characters.
OLE Object	Used to attach an OLE Object to a record. If you want to use OLE features, you must use the OLE Object data type.	Such as a Microsoft Office Excel spreadsheet.
Attachment	Attach supported files to a record similar to attaching files to e-mail messages.	Such as images, spreadsheet files, documents, charts, and other types of supported files.

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Activity 12.1

Written Activity

- 1. What can databases be used for? Give two examples.
- 2. Explain the function of each of the elements in Access (tables, forms, queries and reports).
- **3.** Describe the difference between fields and records in a database.

TERM 4 | CHAPTER 12 INTRODUCTION TO DATABASES | UNIT 12.1 Basics of Access

12.2 Work with different views



Guided Activity 12.1

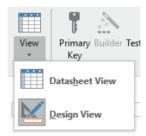
Step 1: Select *View* on the *Home* or *Table Tools* tab.



Step 2: If you are in *Datasheet View*, selecting *View* will switch you to *Design View*.



Step 3: If you are in *Design View*, selecting *View* will switch you to *Datasheet View*.



When you are creating database tables, you will use *Datasheet View* and *Design View*. Each view does different things, but both work together to help you create a well-designed table.

DATABASE VIEW

The *Datasheet View* shows only the data in the database. It allows you to enter and edit data in tables, but you cannot change the formatting of the database (other than adjusting the column width).

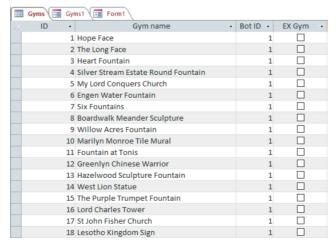


Figure 12.4: The Datasheet View

The *Design View* allows you to create or change the table, form or other database object and allows you to configure the fields (that is, defining the field properties, etc.). *Design View* also allows you to set primary keys and restrict the values that can be entered into a table. You cannot change the actual data in the *Design View*.

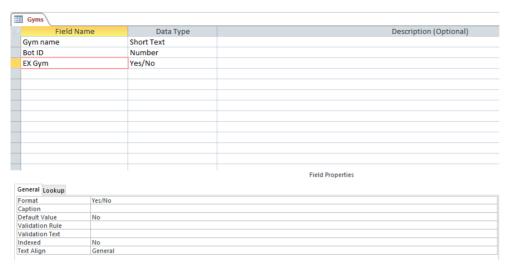


Figure 12.5: The Design View

To work effectively, you will need to switch between the different views as you create and maintain the database tables.

It is important that you know what these two views do before you begin creating tables. Before you can add records and fields to a table, you will need to use *Design View* to design the table. Once that is done, you can switch to *Datasheet View* to add the data.

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TERM 4 | CHAPTER 12 INTRODUCTION TO DATABASES | UNIT 12.2 Work with different views

12.3 Database structure

All Access databases begin with creating tables and adding records and fields to those tables. Getting the basics of creating these tables right is incredibly important if you want the database to be accurate and work correctly.

In this unit, you will learn how to create tables and forms, enter data into tables, add and delete records and fields, validate the data and how to use filters to sort the data. You will also learn how to work with the *Design* and *Table* views, and how to format and edit database tables.

CREATE TABLES

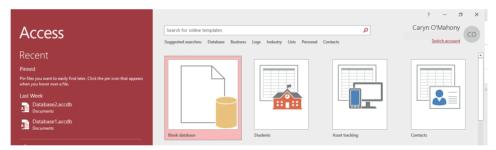
As mentioned in Unit 12.1, tables are the backbone of any database. There are two ways to add a table in an Access database:

- 1. Adding a new table to a new database.
- 2. Adding a new table to an existing database.

Guided Activity 12.2

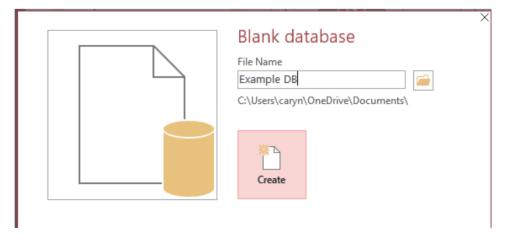
Step 1: Open Microsoft Access.

Step 2: In the Backstage view, select Blank database.



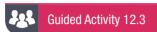
- **Step 3:** Type a name for the database into the *File Name* box.
- Step 4: To save the database in a different location, select the Folder icon.
- **Step 5:** Browse to the location you want to save in.
- Step 6: Select Create.

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A new table is automatically created for you whenever you create a new blank database, since a database cannot exist without a table. To add a table to a database that already has data in it, you will need to:



Step 1: Open Access.

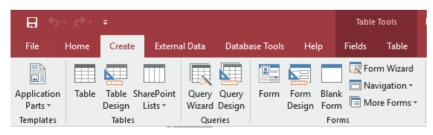
Step 2: Select File and then select Open.



Step 3: If the database is listed under Recent, select it. If not, select Browse and find the database.



Step 4: Select Create.



Step 5: Select Table.



TERM 4 \mid CHAPTER 12 INTRODUCTION TO DATABASES \mid UNIT 12.3 Database structure

PRIMARY KEYS

A primary key is the unique identifier for something across the whole database. Primary keys can be single or multiple fields (for example, in one database the primary key could be just the user ID while another will use the user ID, name, last name and email address as the primary key).



Figure 12.6: Primary key icon

FIELD PROPERTIES

Some of the most important field properties to note are:

FIELD SIZE	This property also exists for the common Text data type. It enables you to set a maximum size limit on data entered into the column. For the Text data type, size refers to the length (number of characters and spaces) of the Text data in the column.
FORMAT	This property enables you to set the precise manner in which Access displays or prints the data that is located in its Tables. As with Field Size, the format available to select depends on the data type of that column.
INPUT MASK	This feature can be useful in data entry situations. Where Format controls how data is displayed, Input Mask controls how data is entered into a particular field. Input Mask is available for the following data types: Text, Number, Date/Time, and Currency.
DECIMAL PLACES	In number fields, you can set the number of decimal places to the right of the decimal point that will be recorded.
DEFAULT VALUE	An important database concept, the default value can help save time in the data entry process. The default value is automatically placed in that column every time a new record is added.
REQUIRED	Required simply forces a user to enter some value, using the proper data type, in the designated field. A new record will not be added if the Required field is not properly completed.



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Activity 12.2

- 1. Create a new database *Activity 12.2*.
 - a. Create a table *Learner Data*. Add the following fields.

FIELD NAME	DATA TYPE
LearnerID	Autonumber
Name	Short Text
Surname	Short Text
Grade	Short Text
Fees Paid	Number

b. Set a primary key for the *LearnerID* field. Save and close the database.

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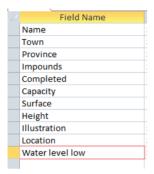
FORMATTING TABLES

Before you can add data to a database, you will need to format the tables. To do this, you will work in the *Design View*. In this view, you can add new field names, determine the data type and give the description for each field.

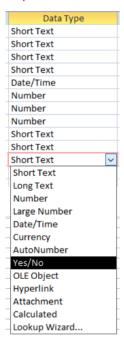


Guided Activity 12.4

Step 1: Add a new field name.



Step 2: Choose the data type from the list.



Step 3: Add a description.

Description (Optional)
The name of the dam/Die naam van die dam
The town in which the dam is located/Die dorp waarin die dam geleë is
The province in which the dam is located/Die dorp waar die dam geleë is
The source river/Die inlooprivier
Date on which the dam was completed/Datum waarop die dam voltooi is
The capacity of the dam/Die kapasiteit van die dam
The surface of the dam/Die oppervlak van die dam
The height of the dam wall/Die hoogte van die damwal
Picture of the dam/Prent van die dam
Coordinates of the dam/Koördinate van die dam
Indicates if the water level is low/Dui aan of die watervlak laag is
7

... continued

TERM 4 | CHAPTER 12 INTRODUCTION TO DATABASES | UNIT 12.3 Database structure

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Something to know

The *General* tab will have different options depending on the data type you choose.



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Step 4: In the *General* tab add validation rules and text, align the text in the field and set the default value.

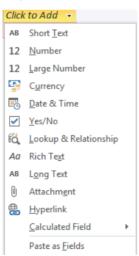
General Lookup			
Format	Yes/No		
Caption			
Default Value	No		
Validation Rule			
Validation Text			
Indexed	No		
Text Align	General		

ADDING AND DELETING RECORDS AND FIELDS

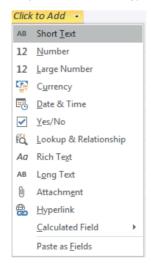
Once the table has been created, you can then move on to adding data to it. You can do this manually.



Step 1: Select Click to Add.



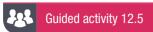
Step 2: Select the data type for that field, in this case *Short Text*.



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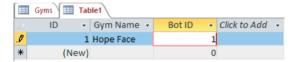
Step 3: Give the field a name, in this case Gym Name.



Step 4: Begin filling in the data.



Step 5: Repeat this for every column.



New data will be indicated by a * at the start of the row.

Every field you add, adds to the records. Once you have filled in one row in a field, the next record will be created below that. Access will also create an ID for each record as you add data to the table.

Adding or deleting records is very simple. Select the box next to the record to highlight it and then right-click to delete it. You will get a warning box that pops up asking if you are sure you want to delete the record. You can also do the same for fields by selecting the field name and then right clicking to delete it.



Figure 12.7: Deleting a record and field



Open the Activity 12.3 database and edit the table tblCode as follows:

- 1. Remove the *ID* field.
- 2. Change the data type for the *Entry date* field to a more suitable data type.
- **3.** Add a new field called *Type*, using an appropriate data type.

... continued

TERM 4 | CHAPTER 12 INTRODUCTION TO DATABASES | UNIT 12.3 Database structure

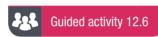
4. Go to the datasheet view and complete the table by adding the following missing data:

CODE	NAME	NAME ENTRY DATE	
Е	Endangered 12/03/2019		Bird
SC	Specific Concern	ecific Concern 05/02/2019 B	
SR	Significantly Rare	10/02/2019	Plant
Т	Threatened	18/03/2019	Plant

Save and close the database.

CREATING A FORM

In Access, you can create a form from an existing table, which will name the form fields based on the field names or create a blank form where you define the form fields yourself.



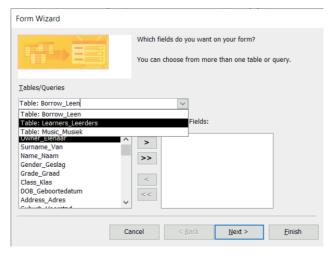
Step 1: Select the *Create* tab.



Step 2: Select Form Wizard.



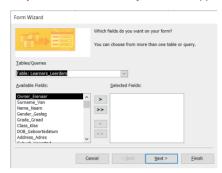
Step 3: Select the table that contains the data for the form in the *GAct 12.6* file.



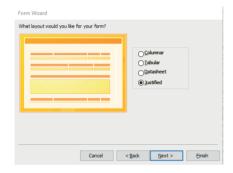
... continued



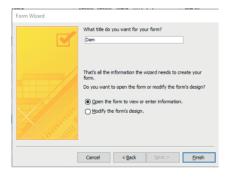
Step 4: Choose the fields you want to appear on the form and select *Next*.



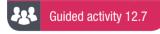
Step 5: Choose the layout for the form. You can choose between columns, tables, datasheet or justified views.



Step 6: Give the form a name and then choose whether you want to open the form to view it or if you would like the change the form's design.



Creating a blank form has a slightly longer process. Blank forms have no controls or preformatted elements.



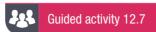
Step 1: Select the *Create* tab.



... continued

TERM 4 | CHAPTER 12 INTRODUCTION TO DATABASES | UNIT 12.3 Database structure

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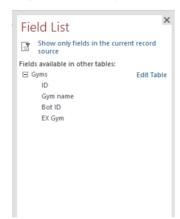
Step 2: Select Blank Form.



Step 3: The Design view becomes available, under the Form layout tools.



Step 4: Access will open a blank form in the Layout view and displays the Field List pane.



Step 5: Select the + sign next to the table or tables that have the fields you want to see in the form in the *Field List* pane.

Step 6: Double click or drag the field onto the form.

DATA VALIDATION AND SORTING

A data validation rule is one way to restrict what is entered into a table field or on a form. Validation text lets you give users who input the incorrect information or invalid data. There are built in data validation rules in Access:

- Data types restrict what data can be entered into a field. For example, a Date/Time field will only accept dates and times, a Number field will not accept text, etc.
- Field properties can also restrict data input. For example, if the amount of data is more than the maximum allowed by the Field Size property, the input will be invalid.

To easily find what you are looking for in a database, you can use filters to sort the data, just like in Excel. To use the filters, select the down arrow next to the field name and select how you want the data sorted. You can choose to sort the fields alphabetically, from smallest to largest, etc. You can also choose to filter out all records that do not share the same criteria (like Bot ID in our example).



Activity 12.4

Open the Activity 12.4 database.

- 1. Create a form called *frmSpecies* based on the *Survey* table as follows:
 - **a.** Include all the fields of the *Survey* table.
 - **b.** Make sure the form has a tabular layout.
 - **c.** Change the font of the form heading to bold and change the background of the form to any colour of your choice.

Save and close the form.

REVISION ACTIVITY

WRITTEN ACTIVITY

Match the description in Column B to the term/description in Column A.

	COLUMN A		COLUMN B
1	Database	А	Shows only the data in the database.
2	Table	В	Searching for and extracting data from tables.
3	Record	С	Different folders.
4	Field	D	Allows you to create/ change the table or other database object and allows you to configure the fields.
5	Datasheet View	Е	A collection of a large amount of data.
6	Design View	F	Used for entering, modifying, and viewing records.
7	Primary Key	G	Present components of the database in a way that is easy to read.
8	Queries	Н	Contain a single type of data.
9	Form	I	Contain all the data in a single row of the table.
10	Report	J	A set of related records/ data.
		K	Unique identifier for something across the whole database.
		L	All the data on the computer.

(10)

PRACTICAL ACTIVITY

Open the Chapter 12_Revision Activity database.

1. Create a new table: *Sales*. The table must consist of the following fields. Note carefully the data type and the size of each field:

FIELD NAME	DATA TYPE	FIELD SIZE/TYPE
Customer ID	AutoNumber	Primary key
Customer name	Short text	20
Customer surname	Short text	25
Shipping	Short text	30
Category	Short text	40
Date received	Date / Time	Medium date

(12)

... continued

TERM 4 | CHAPTER 12 INTRODUCTION TO DATABASES | UNIT 12.3 Database structure

REVISION ACTIVITY

... continued

2. Switch to Design View and enter the following records:

CUSTOMER ID	CUSTOMER NAME	CUSTOMER SURNAME	SHIPPING	CATEGORY	DATE RECEIVED
1	Claire	Nelson	Express	Furniture	19-June-19
2	Sean	Powers	Standard	Technology	22-May-19
3	Andrew	Smith	Express	Office Supplies	10-May-19
4	Sandra	Grove	Express	Furniture	15-April-19
5	Eric	Hoffman	Standard	Technology	20-April-19

Save and close the table.

- 3. Create a form called $\it frm_Sale\ records$ based on the $\it Sales$ table as follows:
 - **a.** Include all the fields of the *Sales* table.
 - **b.** Make sure the form has a tabular layout.

(3)

(5)

Save the form and close the database.

Total: [30]

AT THE END OF THE CHAPTER

	CAN YOU	YES	NO
1	Discuss the uses of a database?		
2	Describe the role of tables, queries, forms and reports?		
3	Explain the difference between records and fields?		
4	Describe how field names determine the data type in each field?		
5	Define the different data types in an Access database?		
6	Describe the structure of a database?		
7	Create tables and forms in an Access database?		
8	Work with design and table views in Access?		
9	Format and edit data and tables in a database?		



TABLES AND QUERIES

CHAPTER 13

CHAPTER OVERVIEW

Unit 13.1: Design database tables

Unit 13.2: Queries

By the end of this chapter, you will be able to:



- Describe other applications that Access can be integrated with.
- Choose the correct data types for tables.
- Set field properties for data fields.
- Design and execute basic queries.
- Select which fields to display in a query.
- Troubleshoot basic Access errors.
- Describe how Access can be used to solve problems.

INTRODUCTION

Databases can also be customised to make reading the data easier. In this chapter, you will learn how to apply custom formatting to fields and records in a database and how to integrate Access into other applications.

You will also learn how to troubleshoot basic Access errors and describe how you can use Access to solve problems.

TERM 4 | CHAPTER 13 TABLES AND QUERIES

13.1 Design database tables

A properly designed database will always give you accurate and up-to-date information when you need it. This is why it is important that you understand how to design a database correctly and how to make a database that can adapt to your changing needs.

In this unit, you will learn about the basics of good database design, how to choose the correct data types for a database and how to set field properties correctly for the fields.

Before deciding to build a database, you may want to look at the templates included in Access to see if any of them match your needs. When you select a template, Access creates a new database based on that template. Once it is created, you can fill the database with your own information or modify it to suit your needs. These template databases are well designed and flexible and are built to meet most common database needs.

BASICS OF GOOD DATABASE DESIGN

There are two main principles that determine good database design:

- No redundant data
- Correct and complete information
- Redundant data is data that is duplicated, meaning that there is more than one record with the same information in it. Redundant data in a database is bad, because it takes up unnecessary space and it can lead to errors when you are creating a report. Information should also be complete and correct because if the data in the database is wrong, any reports you pull from that information and any conclusions you make using those reports will also be wrong.
- A good database design:
 - Divides information into subject-based tables to limit the amount of redundant data.
 - Gives the database program the information it needs to join the data in the tables together correctly.
 - Helps to make sure the data is accurate and maintains its integrity.
 - Matches data processing and reporting needs.
- Before you can begin designing database tables, you need to first determine the
 purpose of the database, that is, what it will be used for. You then need to find and
 organise the information you will want to record in the database, starting with the
 information you already have (such as customer details or song title lists). Once you
 have sorted the information you want, you can design the database tables.

For example, say you have a spreadsheet with customer details that contains the following information:

1. Company name

2. Contact name

3. Telephone number

4. Email address

5. Street address, city, province

6. Post code

You then break it down into the tables you think it should be in. The easiest way to do this is to use some form of visual representation. This could be a piece of paper that you draw on, a whiteboard or a blank Excel spreadsheet. In this case, we are using an Excel spreadsheet.

Guided activity 13.1

Step 1: Sort through the data and break down what you have into columns and rows.



Step 2: Map out the tables according to the data you have and give each field a name.

4	А	В	С	D	E	F	G	Н	1	J	K	Ĺ
1	Companies					Addresses						Contacts
2	Company_ID					Address_ID						Contact_ID
3	Name					Company_ID						Company_ID
4	Create date					Address 1						First Name
5						Address 2						Last Name
6						City						Contact number
7						Province						Email Address
8						Post code						
9						Is_Postal						
10												

Make sure that the ID fields are at the start of each table.

Now that you have the basic idea for the database, you can move on to choosing the correct data type for each field.



Activity 13.1

- 1. Why is it important to have properly designed databases?
- 2. Which two principles determine good database design?
- 3. What is redundant data and why is it bad for a database?
- 4. What benefits does a good database design give you?
- **5.** What is the first step in designing a good database?

CHOOSING APPROPRIATE DATA TYPES

The data types you choose for the tables will be determined by the information you have available and what you want to the database to do. But there are other data types that you will need to use if the ones you learned about previously do not suit your needs.

Other data types you could use are:

- Hyperlinks, which are text or combinations of text and numbers stored as text that are used as a hyperlink address.
- Lookups, which display a list of values taken from a table or query or a set of values you specified when you created the field.
- OLE, or object linking and embedding, objects are information created by other programs (including Word and Excel) that can be embedded in and linked to an Access database. You can also use the Attachment data type to do this.

Guided activity 13.2

This may seem like a simple step, but it can actually take the longest and you will need to ask yourself some interesting questions and give yourself good answers. In this example, we had to ask:

- Why is telephone number not a Number field? They all start with zero and so do some postcodes.
- Why are there two IDs in Addresses and Contacts? Maybe we get more than one contact for each hotel or guesthouse and we need to link them to something.
- Why are we checking the post code? We are not, we are checking that the address given to us is a postal address.
- Why is there a create date in the Companies table? We would like to track how long this hotel or guest house has been buying our products.

FIELD PROPERTIES

When you are choosing data types, you will also need to set the properties for each field. Different data types do have some specific field properties (such as a decimal place for numbers), but there are common data type properties as well.

PROPERTY	DESCRIPTION
Size/length	Determines how much space is allowed for each value. This is determined by the data type. If you are using a Short text field, you can limit the amount characters that can be used. This is especially important for Number and Currency fields because it determines the range of the numbers (for example, one bit can only store from 0–255).
Default value	Automatically assigns a specified value to a field when a new record is added (for example, a user ID when a new user is added). This field property is common to all data types and Access will automatically assign that data type to a field in the record when you add a new record.
Decimal places	Specifies how many decimal places to use when displaying numbers (for example, two decimal places for Currency or four decimal places for Number).
Required	Data must be entered into that field (for example, a username for a social media website). This is usually used when creating the unique identifiers, such as user IDs, in a field using AutoNumber. In a database, you could potentially have 45 J. Smiths, but each one will have a different user ID to make their record unique.
Input mask	A string of characters that indicates the format for valid input values. You use this property when it is important that the format of the input values is the same. For example, Access will not add the value in a telephone number field unless it contains 10 digits.
Validation rule	Specify a criterion that all valid field values must meet before they are added to the database. For example, in a currency field, setting the field to not accept data that is less than or equal to zero (>=0).
Validation text	An error message that displays describing what went wrong when a data entry breaks a validation rule, for example, "Price cannot be a negative number".
Text align	Specifies the default alignment of text in a field. You can set this to left, right or centre.

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ADDING INPUT MASKS, VALIDATION RULES AND VALIDATION TEXT

Input masks and validation rules and text are slightly more complicated to add to a field than other field properties. This section will show you how to add them to fields in a database.

There are three parts to an input mask:

- 1. The first part contains the mask characters or series of characters (the string) along with placeholders and literal data, like brackets, full stops or hyphens. This part must be included.
- 2. The second part is the embedded mask characters and how they are stored in the data. If this is set to 0, the characters are stored in the data, if it is set to 1, the characters are only displayed. This part is optional.
- **3.** The third part indicates a single character or space that is used as a placeholder. This is also optional.

INPUT MASK CHARACTER SHEET

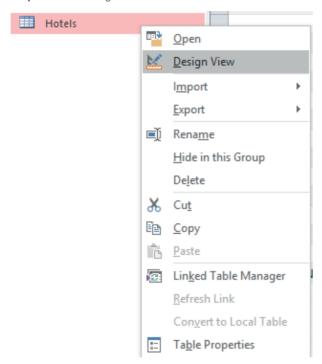
CHARACTER	DECORIDATION
CHARACTER	DESCRIPTION
0	Digit (0 to 9, entry required; plus [+] and minus [-] signs not allowed)
9	Digit or space (entry not required; plus and minus signs not allowed)
#	Digit or space (entry not required; spaces are displayed as blanks while in Edit mode, but blanks are removed when data is saved; plus and minus signs allowed)
L	Letter (A to Z, entry required)
?	Letter (A to Z, entry optional)
А	Letter or digit (entry required)
а	Letter or digit (entry optional)
&	Any character or a space (entry required)
С	Any character or a space (entry optional)
.,:;-/	Decimal placeholder and thousand, date, and time separators (The actual character used depends on the settings in the Regional Settings Properties dialog box in Windows Control Panel.)
<	Causes all characters to be converted to lower case
>	Causes all characters to be converted to upper case
l	Causes the input mask to display from right to left, rather than from left to right. Characters typed into the mask always fill it from left to right. You can include the exclamation point anywhere in the input mask.
\	Causes the character that follows to be displayed as the literal character (for example, \A is displayed as just A)

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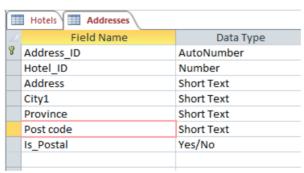
Guided activity 13.3

Step 1: Right click on the table in the *Navigation* pane on the right side of the screen.

Step 2: Select Design View.



Step 3: Select the field you want to add the input mask to.



Step 4: Select the *Input Mask* box in the *Field Properties Group* on the *General* tab.

Step 5: Select the Build button to start the Input Mask Wizard.



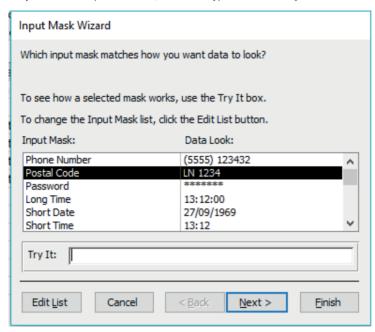
... continued

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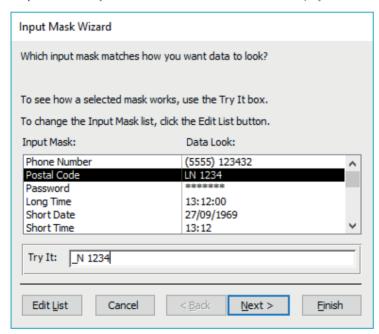
Guided activity 13.3

... continued

Step 6: In the *Input Mask* list, select the type of mask that you want to add.



Step 7: Select *Try It* and enter data to test how the mask displays.



... continued

TERM 4 | CHAPTER 13 TABLES AND QUERIES | UNIT 13.1 Design database tables





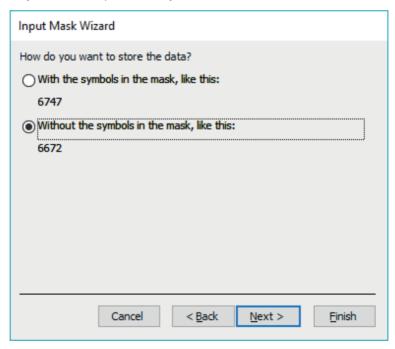
Step 8: To keep the input mask without any changes, select *Next*. Otherwise, select *Edit List* and make the changes you want.



Select Close when you are done.

Step 8a: Select Try It and then select Next.

Step 9: Select an option for how you want the data to be stored.



Step 10: Select *Finish* and save the changes.

VALIDATION RULES AND TEXT

There are two types of validation rules:

- **1. Field Validations Rules** specify the criteria that all valid field values must meet, for example, a date field may have a restriction that does not allow dates in the past.
- 2. Record Validation Rules specify the condition that valid records must meet. For example, a record with two date fields might specify that the first date field must always be a date before the second date field (that is, the start date must be before the end date).

VALIDATION RULE EXAMPLES

TEXT VALIDATION RULE EXAMPLES

EXAMPLE	FUNCTION
Like "G*"	Word must start with G
"M" or "F"	Only enter 'M' (Male) or 'F' (Female)
Like "*@*"	Enter a valid email address
Is Not Null	Field cannot be left empty

NUMBER VALIDATION RULE EXAMPLES

EXAMPLE	FUNCTION
>0	Only positive numbers / numbers greater than 0
>=5	Only numbers greater than or equal to 5
>=10 And <= 100	Numbers between 10 and 100, including 10 and 100
Between 10 And 100	Numbers between 10 and 100, including 10 and 100
2 Or 3 Or 4	Only 2, 3 or 4

DATE VALIDATION RULE EXAMPLES

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Dates should be written according to the South African Regional Settings (yyyy/mm/dd)

EXAMPLE	FUNCTION
>#2019/02/28#	Only dates after 28 February 2019
Between #2019/03/01# And #2019/03/31#	Only dates in March 2019
>Date()	Dates after today's date

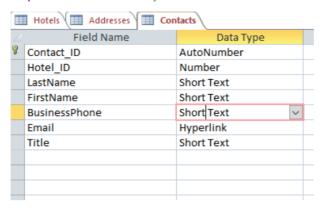
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Guided activity 13.4

To create field validation rules:

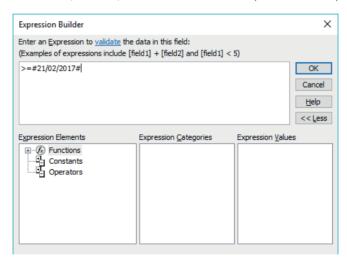
Step 1: Select the field that you want to validate.



Step 2: Select *Validation Rule* in the *General* tab. And then select the *Build* button to start the *Expression Builder*.

Step 2a: Enter an expression into the top field. In this case, we do not want users to enter a date earlier than 21/02/2019.

After or later than, will be indicated by ">" and the "=" suggest that the date 21 Feb 2019 is included. So, dates on, or after the 21st will be accepted in this example.



Step 2b: Select OK.

Step 3: To add validation text, select the field that needs a message. The field should already have a validation rule.

... continued

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Step 4: Select *Validation Text* in the *General* tab.

Format	
Input Mask	
Caption	
Default Value	
Validation Rule	>=#21/02/2017#
Validation Text	
Required	No
Indexed	No
IME Mode	No Control
ME Sentence Mode	None
Text Align	General
Show Date Picker	For dates

Step 5: Enter the message you want to display.

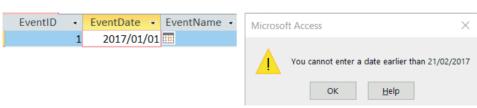
The message will appear as a pop-up if data is typed in the field which is not accepted according to the rule.

General Lookup	
Format	
Input Mask	
Caption	
Default Value	
Validation Rule	>=#21/02/2017#
Validation Text	You cannot enter a date earlier than 21/02/2017
Required	No
Indexed	No
IME Mode	No Control
IME Sentence Mode	None
Text Align	General
Show Date Picker	For dates

To create record validation rules:

- **Step 1:** Open the table you want to validate records for.
- **Step 2:** Select *Validation*, and then select *Record Validation Rule*. This is on the *Fields* tab, in the *Field Validation* group.
- **Step 3:** Use the *Expression Builder* to create the rule.
- **Step 4:** To add validation text, open the table you want to add a message to. The table should already have a record validation rule.
- **Step 5:** Select *Validation* and then on *Record Validation Message*. This is in the *Field Validation* group on the *Fields* tab.
- **Step 6:** Enter the message you want to display. For example, if the validation rule is [StartDate]<[EndDate], the message might be "StartDate must precede EndDate".

Below are error messages that you may get when you enter invalid information:



13.2 Queries

At their most basic, queries are the language you use to display data from a database. It is the way you interact with the database. Using queries makes it easier to view, add, delete or change data, it also allows you to find specific data quickly by filtering using specific conditions, calculate or summarise data and make some data management tasks, like reviewing the most current data, automated.

In a well-designed database, the data is usually located in multiple tables. Working through those tables on your own to find the information you need to create a form or report can be time-consuming and can lead to errors. Queries can pull the information from the various tables, assemble it and display it for you far faster than you would be able to.

There are two major query types:

- 1. Select queries that fetch data from tables or do calculations.
- 2. Action gueries that add, change or delete data.

In this unit, you will learn how to design basic queries using the example of a simple select query. As part of this process, you will also learn how to select the fields you want to display in a query.

DESIGN BASIC QUERIES (AND, OR, NOT, SORT)

Once you know how to create a query in Access, you will be able to work through the database at lightning speed. When you want to select specific data from one or more sources, you will use a select query. This query helps you get only the data you want and helps you combine data from several sources.

In this section, you will learn how to create a select query manually in Access using the *Design View*. This is a very long process and it is easy to make mistakes if you are not careful. You will need to take your time and make sure that you understand each step in the process and that you have done each step correctly before moving on to the next step.



Take note

There are two different options shown for Steps 1 to 3 in this guided activity. Both options then continue with same steps from Step 4 onwards.

Guided activity 13.5

Option 1:

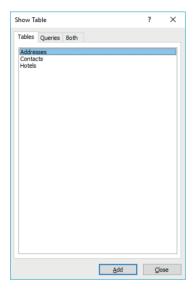
Step 1: Add data sources.

Step 1a: Select *Query Design* in the *Queries* group on the *Create* tab.



... continued

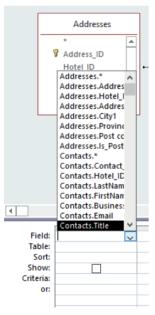
Step 1b: In the *Show Table* dialogue box double-click each data source that you want to use or select each data source and then select *Add*.



Step 1c: Close the Show Table dialogue box.

Step 2: Add output fields.

Step 2a: In the Query Design Window, select the field you want to add.



When you add a field this way, Access automatically fills in the *Table* row of the design grid to show the data source.

Step 3: Specify criteria.

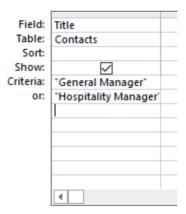
This step is crucial; a query can only exist if you have criteria. No criteria and the full table will be displayed.

Step 3a: Type the criteria in the *Criteria* row in the query design grid.

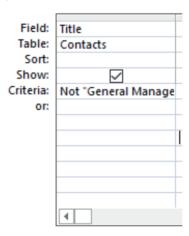
This will be the data that has been typed in the table and should be typed in the same format. The question might ask display all the General Managers, but in the criteria, you will only type General Manager (singular, as this is the way the data has been typed).

... continued

Step 3b: To find matches to multiple criteria, use the *Or:* field in the query design grid. This will return records where one or the other is found.



Step 3c: To exclude a field, use the word "Not" in the Criteria row.



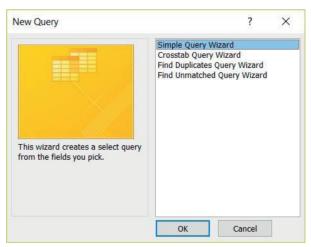
Step 3d: To find more than one specific record, use the word "And" between two criteria in the Criteria row, for example "General Manager" And "Hospitality Manager".

Option 2:

Step 1: Add data sources.

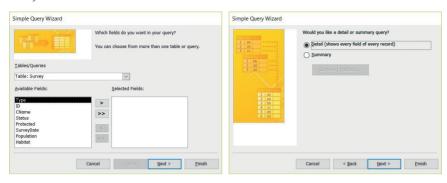
Step 1a: Select *Query Wizard* in the *Queries* group on the *Create* tab.

Step 1b: Select Simple Query Wizard.



... continued

Step 2: Add output fields from *Available Fields* on the *Query Wizard* and select *Next*. Select *Detail Query* and *Next*.



- **Step 3:** Select Finish on the *Query Wizard* Dialogue box and view your Query. To specify criteria, you select *View Design*.
- **Step 4:** Summarise the data if asked to do so.
 - **Step 4a:** With the query open in *Design view*, select *Totals* in the *Show/Hide* group on the *Design* tab. Access displays the *Total* row in the query design grid.
 - **Step 4b:** For each field that you want to summarise, choose the function you want to use from the list in the *Total* row. The functions that are available depend on the data type of the field.
- Step 5: View the results.
 - Step 5a: Select Run on the Design tab to see the query results.



Access displays the results of a query in the Datasheet View.

- **Step 5b:** To make further changes to the query, select the *Home* tab.
- Step 5c: Select View and then Design View to switch back from the Datasheet View.
- **Step 5d:** If necessary, change fields, expressions or criteria, and rerun the query until it returns the data that you want.



Activity 13.2

Open the Activity 13.2 database.

- 1. Create a guery called *grySchool* based on the Contestant table.
 - a. Extract all learners from Cape High School and Bay High School who are 18 years old.
 - **b.** Display only the Surname_Van, Name_Naam, School_Skool and Age_Ouderdom fields. Save and close the query.

REVISION ACTIVITY

A database was created to capture data about different species and survey data about their endangered status.

Open the Chapter 13_Revision Activity database.

- 1. Work in the *tblSurvey* table and make the following changes to the design of the table:
 - **a.** Change the field size of the *CName* field to 40. (2)
 - **b.** The *Status* field must be a required field. (2)
 - **c.** Set the *ID* field as the primary key. (2)
 - d. Create an input mask for the Status field to accept data in the following format:
 - a compulsory capital letter followed by
 - an optional capital letter.
 - Examples: SR, T, etc (4)
 - **e.** Set a validation rule to ensure that users are not allowed to capture dates before 2012 for the *SurveyDate* field. If they should enter invalid dates the following validation text must appear: 'No entries before 2012'.
 - must appear: 'No entries before 2012'. (4) **f.** Change the row height of the table to 20 units. (1)
 - g. Change the font size of the table to 12pt and the font type to Georgia. (2)
 - h. Set all the gridlines on red. (1)
- 2. Create a query called qryPlant based on the Survey table.
 - Display only the Type, CName and Protected fields.
 - Sort the data in ascending order according to the CName Field. (4)
- 3. Create a guery called gryPopulation based on all the fields of the Survey table.
 - Do not show the Habitat and ID fields.
 - Only species of a population of more than 500 must be displayed.
 - Show all the species with a "T" or 'SR" status.

Total: [26]

(4)

AT THE END OF THE CHAPTER

	CAN YOU	YES	NO
1	Apply custom formatting to fields and records in an Access database?		
2	Describe other applications that Access can be integrated with?		
3	Choose the correct data types for tables?		
4	Set field properties for data fields?		
5	Design and execute basic queries?		
6	Select which fields to display in a query?		
7	Troubleshoot basic Access errors?		
8	Describe how Access can be used to solve problems?		

REPORTS

CHAPTER 14

CHAPTER OVERVIEW

Unit 14.1: Reports

Unit 14.2: Formatting technique

By the end of this chapter, you will be able to:

- Design basic reports that include calculations and headers and footers.
- Import and export data to and from an Access database.

INTRODUCTION

In this unit, you will learn how to create basic reports and have basic calculations, such as SUM, AVG, COUNT, MIN and MAX at the end of the report. You will also learn how to add headers and footers to reports and how to import data into and export data from an Access database.

TERM 4 | CHAPTER 14 REPORTS

14.1 Reports

Reports are one of the most useful tasks that a database can do. Reports give you a way to format, view and summarise the information in an Access database for a huge range of different applications. For example, you can create a simple report that gives you the contact information of all the students in your Grade or you can extract a more complex report that lists a company's total sales across all their branches for the last three years.

DESIGN BASIC REPORTS

A report is a database object that you can use to present information for any of the following reasons:

- To display or distribute a summary of the data
- Archive snapshots of the data
- Give details about individual records
- Create labels

Creating a report in Access is relatively easy, as long as the database is well-designed.

DIFFERENT SECTIONS OF A REPORT

- **a. Report Header:** At the beginning of the report. Use the report header for information that might normally appear on a cover page, such as a logo, a title, or a date.
- **b.** Page Header: At the top of every page. Use a page header to repeat the report title on every page.
- **c. Group Header:** At the beginning of each new group of records. se the group header to print the group name.
- **d. Detail section:** Appears once for every row in the record source. This is where you place the controls that make up the main body of the report.
- e. Page Footer: At the end of every page. Use a page footer to print page numbers or per-page information.
- **f. Report Footer:** At the end of the report. Use the report footer to print report totals or other summary information for the entire report.

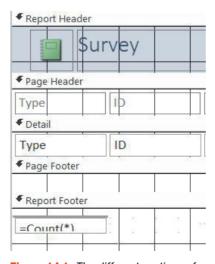
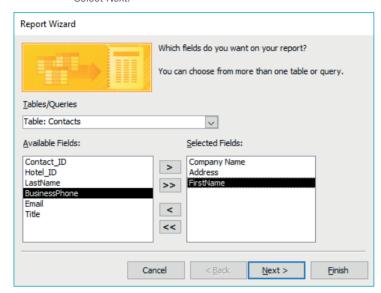


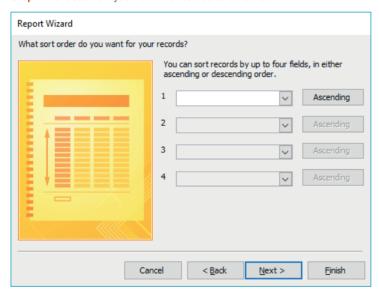
Figure 14.1: The different sections of a report

Guided activity 14.1

- **Step 1:** Open under the *Create* tab, locate the Report group and select the *Report Wizard*.
- **Step 2:** Select the table or query on which the report should be based.
- **Step 3:** Select the fields you want on the report:
 - will add one field at a time
 - will add all the fields in one click Select *Next*.



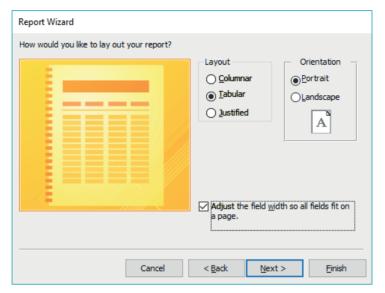
Step 4: Choose how you want the records to be sorted.



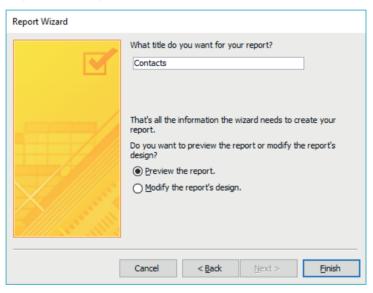
... continued

TERM 4 | CHAPTER 14 REPORTS | UNIT 14.1 Reports

Step 5: Choose how you want to lay out the report.



Step 6: Give the report a title.



Step 7: Select Finish.

'The report will then open in the design view, where you can continue with formatting and editing

Once you have finished creating the report, you can format it in the ${\it Layout}$ view.



Open the Activity 14.1 database.

- **1.** Create a report called *Country* based on the Info_Inlig table as follows:
 - **a.** Display only the following fields: Surname_Van, Country_Land, Departure_Vertrek and Arrival_aankoms.
 - **b.** Sort the records in the report according to the Surname_Van field.
 - **c.** Use the outline layout.

Save and close the report.

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EXAM TIP

Create the habit of changing the radio button to *Modify the report design*, as this will always be asked in examinations.

BASIC CALCULATIONS IN A REPORT

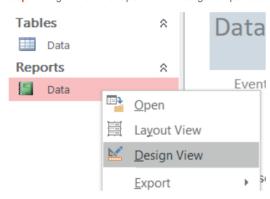
You can add basic calculations to a report in either the *Layout* view or the *Design* view. Table 14.1 gives a breakdown of the basic calculations which can be added to a report.

Table 14.1: Basic report calculations

CALCULATION	DESCRIPTION	FUNCTION
Sum	The sum of all the numbers in the column. Sum()	
Average	The average value of all the numbers in the column. Avg()	
Count	The count of items in the column. Count()	
Maximum	Maximum The highest numeric or alphabetic value in the column. Max()	
Minimum The lowest numeric or alphabetic value in the column. Min()		Min()

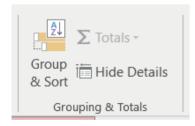


Step 1: Right click the report in the Navigation pane and then select Design view.



Step 2: Select the field you want to summarise.

Step 3: Select *Totals* in the *Grouping & Totals* group in the *Design* tab.



Step 4: Select the calculation you want to add for that field.

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Guided activity 14.3

Step 1: Right click the report in the Navigation pane and then select Design view.

Step 2: Select the field you want to summarise.

Step 3: Select *Totals* in the *Grouping & Totals* group in the *Design* tab.

Step 4: Select the calculation you want to add for that field.

HEADERS AND FOOTERS

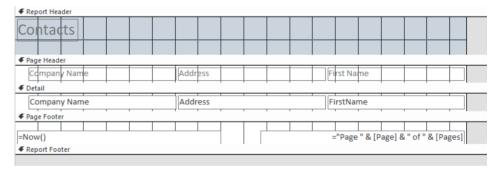
Headers and footers are report sections you can use to display information that is common to the entire report, or to each page of a report. For example, you can add a Page Footer section to display a page number at the bottom of each page, or you can add a Report Header section to display a title for the entire report.



Guided activity 14.4

Step 1: In the *Navigation* Pane, right click the report that you want to change, and then select *Design View* on the shortcut menu.

Step 2: Verify which sections are already on the report. The sections are separated by shaded horizontal bars called section selectors. The label on each section selector indicates what the section directly below it is.



Every report has a *Detail* section and can also contain *Report Header*, *Page Header*, *Page Footer* and *Report Footer* sections. In addition, if there are grouping levels in the report, you might see group headers or footers. By default, group headers and footers are named by using the field name or expression that is the basis of the group. To have access to the group footers and headers, you need to open the group and sort command on the ribbon.

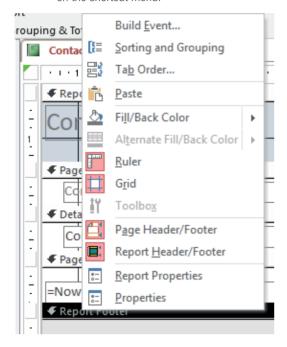
... continued

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Guided activity 14.4

... continued

Step 3: To add page header and footer sections or report header and footer sections to a report, right click any section selector and then select Page Header/Footer or Report Header/Footer on the shortcut menu.





EXAM TIP

When you have completed the Wizard to create a report, always select *Modify* the report design.

Do the following before you continue with the questions:

Open the area for the report footer, by dragging the double arrow cursor.

Calculations based on the entire report will always be done in the report footer.

Select Group & Sort and check that you have grouped and sorted correctly.

Select More and change the drop-down arrow to with a footer.



Any calculation based on the group, must be completed in the group footer.

Page footers will only contain dates, times and page numbers.

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Activity 14.2

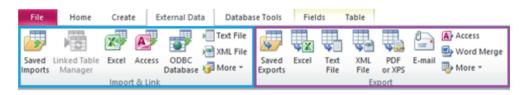
Open the Activity 14.2 database.

- 1. Create a report called *rptFees* based on the tblBookings table.
 - **a.** Display only the Name, UnitType, Days and AmountReceived fields.
 - **b.** Use a function to display the total amount received by unit type.
 - **c.** Use a function in the Report Footer to display the average amount of all the money received. The amount must be displayed as currency (SA Rand).
 - **d.** Use the tabular layout for the report.

Save and close the database.

IMPORT/EXPORT DATA

You can import data from an Excel spreadsheet to an Access database, but it is far easier to copy the information from Excel and paste it in Access.



O

Set up Access to link to data

For more information on how to import a whole spreadsheet at once, visit: https://support.office.com/en-us/article/import-or-link-to-data-in-an-excel-workbook-a1952878-7c58-47b1-893d-e084913cc958

Guided activity 14.5

- Step 1: Select the column you want to copy and then press Ctrl+C.
- Step 2: Open a new Notepad document and paste the data there by pressing Ctrl+V.
- Step 3: Copy the data from Notepad.
- **Step 4:** In Access, select the field you want to populate, making sure to select the whole column (select the field name at the top) and then press Ctrl+V.

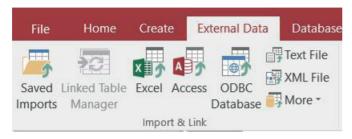
The data should paste in the field.

You can also import data into Access from a text file, such as a *.csv file. You will need to prepare the text file properly before you start the import process. It is easiest to import data from a delimited CSV file that uses either a comma or semicolon (;) as the delimiter. To prepare the file, open it in Notepad and check that the delimiter is used consistently throughout the file. The file should also not have more than 255 fields and you should remove any extra characters (such as double spaces and tabs). Make sure the field names are in the top row and that they are separated with the delimiter. Do not work with the source file (for example, the Excel file) still open.

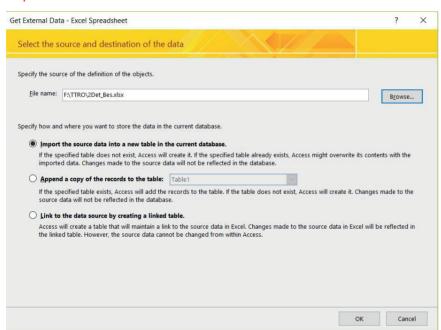
Once you have prepared the file, you can follow the steps in the example below to import the data.

Guided activity 14.6

Step 1: Open the Access database you want to import to or create a blank database. On the *External Data* tab in the *Import&Link* group you have to select the application you need to import the data from.



- **Step 2:** If you are importing an Excel file, you select Excel and on the dialogue box, you browse and select the file.
 - **Step 2a:** To add the data to a new table, select Import the source data into a new table in the current database.
 - **Step 2b.** To add data to an existing table, select Append a copy of the records to the table and choose the table from a drop-down list.
 - Step 2c. A link to the source file can also be created.

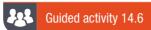


- Step 3: On the Import Spreadsheet Wizard select which worksheet you want to use (if applicable).
- **Step 4:** If the first row of your spreadsheet has column headings, then select these as field names for your table (place a tick in the checkbox).
- **Step 5:** In this step you can confirm (and change, if need be) the field names and data types of each field.
- **Step 6:** In the next step Access can add a primary key (an Autonumber field called ID) OR you can select one of your fields as primary key OR you can create the table without a primary key.
- **Step 7:** In this final step you can choose a name for your table.

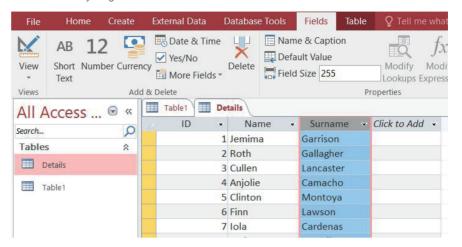
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Step 8: Open the table in the Datasheet View and compare the data with the source document. Check that everything is correct.





Activity 14.3

- 1. Create a new database Activity 14.3.
 - a. Create a table by importing the data from the *Learners* spreadsheet.
 - **b.** Use the worksheet name as the table name.

Save and close the database.

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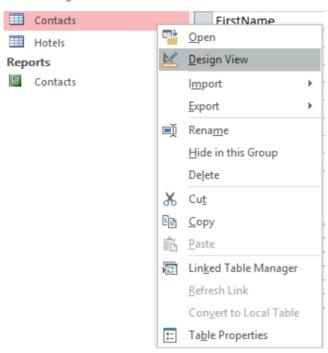
14.2 Formatting techniques

You can use the Design View to apply custom formatting to the database. To do this, you enter different characters into the Format property of a table field. These characters are placeholders (like # or 0), separators (like full stops and commas), literal characters and colours. There are different placeholders for different data types. In Guided activity 14.7, we are going to format a text field.

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Guided activity 14.7

Step 1: In the *Navigation Pane*, right-click the table that you want to change, and then select *Design View* on the shortcut menu.



- **Step 2:** Select the field that you want to format.
- Step 3: On the General tab, select the cell next to the Format box.
- Step 4: Enter the format. In this case, we want the last names to be Magenta.

General Lookup	
Field Size	255
Format	[Magenta]
Input Mask	
Caption	Last Name
Default Value	
Validation Rule	
Validation Text	
Required	No
Allow Zero Length	No
Indexed	No
Unicode Compression	Yes
IME Mode	No Control
IME Sentence Mode	Phrase Predict
Text Align	General

Step 5: Press CTRL+S to save your work.

14.3 Integration



As you learnt in Chapter 7, Access can be integrated with Word to provide data during a Mail Merge. Access can also be integrated with:

- Windows SharePoint Services
- Microsoft Outlook
- Microsoft SQL Server
- Azure SQL Server Database

In most cases you can import data, which creates a copy of the data and does not synchronise any updates, or you can link the data, which creates a two-way connection so that when you make changes in Access, the changes reflect in the other platform. Each program you want to integrate Access with has a different procedure for linking.

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14.4 Troubleshooting

Since databases can contain a large amount of data and the links between that data can be complex, things can sometimes go wrong. When this happens, you can very often fix an issue yourself. If something does go wrong, you can try the following:

- Make sure the data type has been selected correctly for the field.
- Check to make sure your queries have been formulated correctly.
- Check the data to make sure that it is complete.
- Restart Access, making sure to save your work.
- Backup your data and then copy it all to a blank database.
- Shut your computer down.

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- Make sure you have the latest version of Access with all of the latest patches and fixes.
- In extreme cases, you may need to uninstall Access and reinstall it. If this does happen, make sure you have a backup of your data.
- You can also use the Help pane in Access by pressing F1 on your keyboard and searching for your error or using the Tell me what you want to do search bar next to the tabs in Access. You can also visit the Microsoft support website and search for your problem.

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TERM 4 | CHAPTER 14 REPORTS | UNIT 14.4 Troubleshooting

14.5 Problem solving with databases

While it is important that you learn how to use Access to create and maintain databases, you also need to know why you need to use Access. Like with Excel, Access can be used to solve real-world problems.

Examples of how you can use databases to solve problems are listed below:

- Help businesses keep track of customer, product and sales data, and link them to
 each other to draw conclusions about how well certain products are performing, when
 the company's sales perform better and which customers order specific products
 the most.
- Help schools keep track of how many students they have registered, which subjects each student is taking and what their marks are per subject.
- Help people or companies catalogue or track their products, for example, a store using a database to track when they need to reorder certain products and how often products are bought.
- In the next section, you will be shown how to create a database based on a specific scenario. This will help you understand how databases can be used to solve problems.

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14.6 Designing databases for specific purposes

Since databases can become incredibly complex, especially when you have many tables with many different fields, it is important to plan the structure of your database and what you will want it to do for you while you are using it.

In Chapter 9 of this book, you learned about the basics of good database design and how to make sure your data was correct and complete. You were also shown how to sort that data into different tables. In Example 8.2, you will see how Access can be used to solve everyday problems based on the knowledge you have of the program.

Mandla's movie collection

Mandla loves classic horror films and he has 200 classic horror movies in his DVD collection. He wants to find a way of keeping an easy record of what is in his collection. Until now, he has been using an Excel spreadsheet, but as he adds more movies to his collection, it is becoming unmanageable. Especially considering he has special editions of some movies, so he has duplicates in his spreadsheet.

Mandla decides he wants to create an Access database that will keep track of the films he has. He looks at his spreadsheet and determines that movies all have the following things in common:

- A director
- A title
- A movie studio

He decides that these three items will become his tables. He starts by taking his Excel spreadsheet and breaking the data down. He copies all the directors' names into a new sheet and removes the duplicates, reducing his 200 entries to just 50. He decides to add a small biography to each director's name. Next, he looks at the movie studios and goes through the same process as he did for the directors.

He knows that he will need to link directors to films and films to studios, so those will need primary keys in his database. Since director and studio names will be in text, he decides that those fields will be Short Text fields and the directors' biographies will be Long Text/Memo fields.

For his movies, he decides he wants to list the titles and release dates in his "Movies" table so he will need a Short Text field and a Date/Time field. He also wants to add a Yes/No field to show if the movie is a special edition or not.

He now has the basic structure of his database in place and can build it. Once he is done building his database, he can link the tables together using the primary keys in the "Directors" table and the "Studios" table. He can also create queries that look for movies directed by the same director, or movies that were released by the same studio in the same year.

With his database, Mandla is now able to keep proper track of films he does and does not have.

TERM 4 | CHAPTER 14 REPORTS | UNIT 14.6 Designing databases for specific purposes

REVISION ACTIVITY

WRITTEN ACTIVITY

- 1. Explain the difference between *Design View* and *Datasheet View* of a table. (2)2. Why are reports useful tasks a database can do? (2)
- 3. Complete the following table on the basic calculations you can use in a report. (4)

CALCULATION	DESCRIPTION	FUNCTION
(a)	The sum of all the numbers in the column.	Sum()
Average	The average value of all the numbers in the column.	(b)
Count	(c)	Count()
Maximum	The highest numeric or alphabetic value in the column.	(d)

4. Which delimiter should you use in a *.csv file to make importing easier? (1) **5.** Which view do you use to apply custom formatting to a database? (1) 6. Which other applications can you integrate Access with? (4) 7. List two things you can do to troubleshoot errors in Access databases. (2)

The lowest numeric or alphabetic value in the column.

8. Describe the three ways you can access the Help pane in Access. (4)

PRACTICAL ACTIVITY

(e)

A database contains data about blood donors in schools.

Open the Chapter 14 Revision Activity database and do the following:

- 1. Open the Info table and change the following:
 - a. Change the field size of the Name field to 20. (1)
 - **b.** Set the default value for the Grade field to 10. (1)
 - **c.** Add a new field called Gender, using an appropriate data type, so that it appears immediately after the Grade field. (3)
 - d. Add a validation rule to the Gender field so that only a "M" or "F" can be entered. If a user makes a mistake the following validation text should appear, "only M or F allowed". (4)
 - e. Add an appropriate feature that will allow the Weight field to accept data entered in
 - the following way: • 2 compulsory numbers followed by KG.
 - EXAMPLE: 85KG, 50KG

Save and close the Info table.

- 2. Create a query called *qryGrade* based on the Info table.
 - Display only the Surname, Name, Grade and Category fields.
 - Sort the records alphabetically according to the surname.
 - Show the records of all the donors who are in grade 10 and grade 11.

Save and close the *qryGrade* query.

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- 3. Create a form frmDonors based on the Info table.
 - Select only the following fields: Name, Surname, Age, Category and Blood Type.
 - Place a new label in the form header and type in 'Donor Info'. Change the font size of the heading to 14pt and change the background colour of the heading to yellow.
 - Add the date and time to the Form Footer. (6)Save and close the frmDonors form.

Min()

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(3)

(4)

REVISION ACTIVITY

... continued

- **4.** Create a report called *rprtBlood Donated* based on the Info table.
 - Display only the Name, Surname, Grade, Weight and Litres Donated fields.
 - Group the records according to the Grade field.
 - Sort the records according to the Surname field.
 - Add the following functions in the report footer:
 - Insert a function to determine the average litres of blood donated by all the learners.
 - Insert a function to determine the total number of learners.

(8)

Save and close the *rptBlood Donated* report.

Save and close the database.

Total: [50]

AT THE END OF THE CHAPTER

	CAN YOU	YES	NO
1	Design basic reports that include calculations and headers and footers?		
2	Import and export data to and from an Access database?		

TERM 4 | CHAPTER 14 REPORTS | UNIT 14.6 Designing databases for specific purposes



CHAPTER OVERVIEW

Unit 15.1: Introduction to HTML

Unit 15.2: Basic HTML tags

Unit 15.3: Text formatting

Unit 15.4: Putting it all together

By the end of this chapter, you will be able to:



- Describe what HTML is and what it is used for.
- Discuss what an HTML editor is.
- Define HTML syntax.
- Explain the structure and design of a simple HTML page.
- Identify and use basic HTML tags, including document and text tags.
- Use HTML comments.
- Identify and use the correct attributes and syntax for HTML links, images and lists.
- Describe the principles of good website design.

INTRODUCTION

While you may not have learned anything about HTML in Grade 10, you learned about some key concepts related to this topic. To refresh your memory, the Internet is the underlying network connecting computers, servers and people all around the world. The World Wide Web, on the other hand, is what we think about when someone talks about the internet. The World Wide Web, also known as the WWW, is all the web pages, pictures, videos and other online content that can be accessed through a web browser.

A website is a web page, or collection of web pages, that contains specific information provided by a single source. The pages all share the same uniform resource locator (URL), like www.en.wikipedia.org, and have a similar design and theme. Web pages are made up of text, pictures, audio clips, video clips, animations and other media.

Web pages are linked to each other on a website using hyperlinks. A hyperlink is a connection between one section of the document and another (like the hyperlinks on page numbers in the Table of Contents in a Microsoft Word document) or to another document entirely.

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A URL is the website's address. It is basically the unique place on the WWW where the website is kept, sort of like your house or school's street address.

In this chapter, you will learn all about what HTML is and how you can use it to create websites. You will be shown what an HTML editor is and how they work. You will also be introduced to HTML syntax and the structure and design of a simple web page.

You will then be taught about the basic building blocks of HTML, specifically basic document tags, text element and formatting tags and HTML comments. You will also learn how lists, images and links are indicated in HTML.

Lastly, you will learn about what makes a good website and what you will need to keep in mind when designing and building a website.

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TERM 4 | CHAPTER 15 INTRODUCTION TO HTML

15.1 Introduction to HTML

Every website, regardless of what it is used for, uses HTML. It is the foundation of the entire World Wide Web and the backbone of every website and web page. Understanding what HTML is, how it works and how you can use it is an essential skill in the internet age.

In this unit, you will learn about HTML and HTML editors. You will also learn how HTML is structured (its syntax). You will use this knowledge and build on it in the other units in this chapter.

WHAT IS HTML?

HTML stands for *HyperText Markup Language*. This may seem confusing and like it tells you nothing, so let us break down what each portion means on its own:

- HyperText refers to the fact that HTML allows you to click on links on the web page so
 you can move from one place to another in a web page (like the hyperlinks in a
 standard Microsoft Word document).
- Markup Language simply means that normal English is marked to indicate things in a way that web browsers understand.

WHAT IS AN HTML EDITOR?

An HTML editor is a text editor (that is, a program on your computer) to help make writing HTML easier. The HTML editor Notepad++ is commonly used for writing HTML. Notepad++ can be downloaded and used for free. Other free text editors that could be used are, for example, Brackets and Atom.

```
E:\DBE Textbook\Benoni July 2018\HTML\basic.html - ...
File Edit Search View Encoding Language Settings Tools Macro Run
Plugins Window ?
 ] 🚽 🗎 🖺 🖺 😘 🦓 📥 | 강 🖦 🐚 그 c | # 🛬 🔍 🤜 🖫 🖼
🔚 basic.html 🗵
       <!DOCTYPE html>
   3 占
          <head>
   4
            <title>My Webpage</title>
   5
          </head>
   6
           <body>
   8
              <h1>Joe Bloggs</h1>
   Q
           </body>
  10
     | </html>
Ln:1 Col:1 Sel:0|0
                                   UTF-8
                      Windows (CR LF)
                                                  INS
```

Figure 15.1: Notepad++

Using Notepad++ means that you do not have to download or buy a specific HTML editor. It is a more sophisticated text editor than Notepad which is included with the Windows operating system. It uses colours for your HTML code which allow you to identify errors. To save web pages in Notepad++, you must change the format from *.txt to *.html.

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There are many other HTML editors such as Adobe DreamWeaver, KompoZer and Microsoft Expression Web available. These allow you to design web pages without using HTML. In CAT you are expected to write the HTML yourself.

HTML SYNTAX

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HTML syntax is the system of rules governing how tags should be used and in which order. It is, essentially, the grammar rules of HTML. If the syntax of a tag is incorrect or not used correctly, your website could break and might not display correctly. This can cause major problems in more complex sites where pages depend on each other to load or work correctly. The syntax helps you define where something starts and ends.

All HTML elements can be found in pairs inside angled brackets (< >). These are called tags. For a web page to display correctly in a browser, the elements and tags must give the browser the correct instructions on what to display and where. HTML syntax describes where each tag must be and if they need to be inside other tags. Links, lists, images, etc. all have their own specific syntax to let the browser know what to display and how to display it.

HTML syntax is standardised and The World Wide Web Consortium (W3C) develops, publishes and maintains those standards. There have been many versions of HTML since the beginning of the WWW and each version has been updated as web technology has advanced. The current set of HTML standards is called HTML 5.

In CAT you will be learning an earlier version of HTML. This will prepare you well to move to the newer version if you need to.



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15.2 Basic HTML tags

In order to build a website, you will need to know what the different HTML tags do so that you can give web browsers the correct instructions on how and what to display and in which order to display it for your website.

In this unit, you will learn about the structure of an HTML page, opening and closing tags, and what they do and basic document tags, like <html>, <head>, <body> and <h> and where they are used in a web page. You will also learn about text element and formatting tags and how to use them. Lastly, you will learn about HTML comments and how and why they are used on a web page or website.

OPENING TAG AND CLOSING TAG

Before you can learn about the different tags, you need to understand the structure of a tag. All HTML tags come in pairs, the first one is known as the opening tag and the second one is the closing tag. Tags are enclosed by angle brackets and the opening and closing tags look the same. The only difference is that the closing tag has an added forward slash (/) after the first angled bracket.

<h1>Closing and opening tags are cool</h1>

The green tag above is the opening heading 1 tag and the red tag is the closing heading 1 tag.

Pairs of tags with content between them such as the example above, are sometimes referred to as elements.

BASIC DOCUMENT TAGS

The basic document tags are used to set up the structure of a web page. They will all appear on every web page which you create using HTML. The table below shows the basic tags and briefly explains what their purpose is.

TAGS	FUNCTION
html	<pre><!DOCTYPE html> tells the web browser that you are using HTML 5. It is not required for CAT and can be omitted.</pre>
<html> </html>	Tells the browser that this is an HTML page.
<head> </head>	This element contains meta information about the document. This can include a page title, keywords, the author of the document, when the document was last updated, etc.
<title> </title>	Specifies a title for the document. The title will be displayed on the browser tab. These tags must be written inside the <head> </head> tags.
<body> </body>	Defines the body of the web page; contains all the visible page content. Tags to display text, images, backgrounds and videos on the page are all found between the <body> </body> tags.

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Guided Activity 15.1

1. Open a blank Notepad ++ document and type in the following code:

- 2. Save this web page as HelloWorld.html.
- 3. You will not be able to open it in a browser if you have not saved the file as a *.html file.

HEADING ELEMENTS

Heading tags are used to display text as headings. These tags are like heading styles used in a word processor. The table below shows the heading tags:

TAG	FUNCTION
<h1> </h1>	Displays a level 1 heading. This is the main heading of your web page and should only be used once on each web page.
<h2> </h2>	Displays a level 2 heading. These, and the other heading levels, are used to display sub-headings. They can be used more than once on each web page.
<h3> </h3>	Displays a level 3 heading.
<h4> </h4>	Displays a level 4 heading.
<h5> </h5>	Displays a level 5 heading.
<h6> </h6>	Displays a level 6 heading.

Guided Activity 15.2

1. Type the following code into Notepad++. Make use of the *TAB* key to indent your code correctly.

... continued

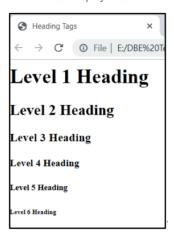
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... continued

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- 2. Save the file as Headings.html.
- **3.** Open the file *Headings.html* in a web browser such as Google Chrome or Microsoft Edge. Right-click on the file name, click on *Open With* and select the browser of your choice.
- **4.** Your browser display should look the figure below:



Notice that all headings are displayed in bold and with space above and below them. A level 1 heading has a bigger font size than a level 2 heading, and so on. You should also see the web page title, "Heading Tags", displayed in the browser tab.

In most web pages, only the first three heading levels are used.

TEXT ELEMENTS

Text elements are used to display all text on your web page other than headings. The table below shows the text elements that you need to know:

TAGS	FUNCTION
	Displays a paragraph of text. A line is left open after each paragraph. Most text on a web page is displayed using tags.
 	This is a line break tag. It displays the next line of text on a new line but without a space above it.
	This tag is one of the few tags that does not come in pairs. The closing tag forms part of the opening tag.
<hr/>	This tag displays a horizontal line. (hr stands for horizontal rule.)
	This tag is used to separate sections of your web page or underneath heading tags to make them stand out more.
	This tag also does not come in pairs as is never used to display text.

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Guided Activity 15.3

1. Type the following code into Notepad++. Make use of the TAB key to indent your code correctly.

- 2. Save the file as text.html.
- 3. Open the file *text.html* in a web browser.
- 4. Your browser display should look like the figure below:



Take note of the difference in the way the two paragraphs are displayed.

TEXT FORMATTING

There are two tags that are used to make parts of a paragraph stand out. These tags are explained in the table below:

TAG	FUNCTION
 	Used to display text in bold.
<i>> </i>	Used to display text in italics.

Both tags are often used inside a pair of p> and are applied to important word or words that need to be emphasised. Because of this they are sometimes known as inline tags.

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Guided Activity 15.4

- 1. Open the file *text.html* which you saved after the last Guided Activity in Notepad++.
- 2. Make the following changes to the HTML code:
 - a. Display all occurrences of the word "fox" in bold.
 - **b.** Display all occurrences of the word "dog" in italics.
- 3. Your code should now look like this:

- 4. Save the file as text2.html.
- **5.** Display the file in a web browser. Notice how all the words "fox" appear in bold and all the words "dog" appear in italics. Do not close the browser tab.



- **6.** Delete the closing tag < / b > after the first "fox". Save the file again. Switch to the browser and refresh the web page. Either click on the refresh button or press the function key F5.
- 7. What happened to the way the text was displayed? Notice that omitting a closing tag can cause your web page to display in unexpected ways. In Notepad++ if you click on an opening tag it should be highlighted with a coloured background. The closing tag should also be highlighted.

fox

If the opening tag is not highlighted, then you know that the closing tag is missing.

Something to know

In HTML 5 the and <i> tags are no longer used. HTML is only used to display the content of a web page and to indicate its meaning. Formatting is done using Cascading Style Sheets (CSS). CSS has a completely different syntax than HTML and is more difficult to learn.

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HTML COMMENTS

When you want to make a note to yourself in your HTML, you can use the comments tag. Comments allow you to keep track of what you have done or to remind you to do something without displaying that information on the website. Comments tags can be inserted anywhere in the HTML source code.

You can also use comments to find errors in your code (this process is called debugging), by commenting out one line of code at a time to see which one is actually causing the problem. You can add comments by using this tag:

<!-- This is a comment tag -->

Note that there is an exclamation mark (!) in the opening tag, but not the closing tag.



Activity 15.1

PRACTICAL ACTIVITY

You are going to create a web page where you will display information about yourself. Type the HTML code in Notepad++. Save the file as *Act 15_1.html*.

It is a good idea to save your file after each step. View what you have done in a browser to check that you have not made any mistakes. Do not close the browser. Save any changes you have made in Notepad++ and then refresh the browser window to update the display.

- 1. Create the basic structure of the web page using the correct document tags. Give the web page the title "Personal Information".
- 2. In the body of the web page do the following:
 - a. Display the text "All about me!" as the main heading on the page.
 - **b.** Display the text "Favourite sports" as a level 2 heading. Display a horizontal line under this heading.
 - **c.** Write the names of two sports you enjoy doing or watching under this heading. The name of the sports must be in a paragraph but each one must display on a new line.
 - **d.** Display the text "Favourite subject" as a level 2 heading. Display a horizontal line under this heading.
 - e. Write two short paragraphs explaining why the subject is your favourite.
 - **f.** Include the name of the teacher who teaches this subject in one of the paragraphs. The teacher's name should be displayed in bold.
 - **g.** At the end of the document, just before the closing tag, type in "Created by [your name]". Use a tag to ensure that this text is NOT displayed in the browser.
- **3.** Save and close the file *Act 15_1.html*.

15.3 Text formatting

In the previous unit you probably noticed that your web pages are all rather boring. All the text is coloured black, the fonts are the same and everything is aligned on the left of the page. In this unit you will learn how to use attributes to make your web pages look more interesting.

Attributes are added to opening tags and they are used to modify how the element displays on the screen. It is important to follow the correct syntax when using attributes to ensure that your web page displays correctly.

ANATOMY OF AN ATTRIBUTE

An attribute is made up of two parts:

- The attribute name
- The attribute values

The quick brown fox

Note the following:

- Attributes are ONLY added to opening tags. You should NEVER include an attribute in a closing tag.
- Attribute values should be enclosed in quotes. In HTML 5 quotes are sometimes
 optional. You should always add quotes so that you do not have to remember when to
 use them.
- Sometimes attribute values use American spelling, for example center (not centre) and color (not colour).

ALIGNMENT ATTRIBUTES

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Alignment attributes are used with text and heading tags to control where the text is displayed on the page. The table below shows the different values that can be used:

ATTRIBUTE	VALUE	FUNCTION
align	left	Aligns the text on the left side of the page. This is the default alignment for most HTML elements, so it is seldom used.
	center	Aligns the text in the centre of the page. (Note the spelling.)
	right	Aligns the text on the right side of the page.

The align attribute is used with the p> tag as well as the h1> to h6> tags.

It is also possible to align text elements (and others such as images) using the <center> </center> tag. The <center> tag must surround another element (enclosing both opening and closing tags). See the example below:

<center>The quick brown fox</center>

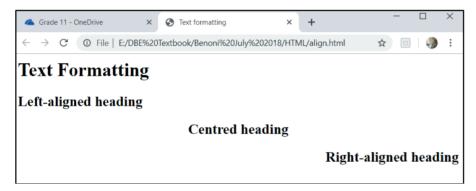
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Guided Activity 15.5

1. Type the following code into Notepad++.

```
🔚 align.html 🗵
    <head>
           <title>Text formatting</title>
 4
        </head>
 5
        <body>
           <h1>Text Formatting</h1>
 8
 9
           <h2 align = "left">Left-aligned heading</h2>
           <h2 align = "center">Centred heading</h2>
            <h2 align = "right">Right-aligned heading</h2>
 11
 13
        </body>
 14
    l</html>
```

- 2. Save the file as align.html.
- 3. View the file in a web browser.



4. If your web page does not display correctly, go back and check your code carefully.

If you resize your browser window, the centred heading will still appear in the centre of the page. Notice that in Notepad++ the colours of the attribute and the attribute values, the text and the tags are all different. These colours only appear after you have saved the file as *.html. The colours will also not appear if, for example, you spell the attribute incorrectly.

WORKING WITH FONTS

The appearance of text can also be improved by using a different font, font size or font colour. Changing the font of text or headings requires the use of a new tag, the tag. This tag has its own attributes.

The font tag is always used in combination with a p> or h*> tag. The font tag is written inside the p> or h*> tags. This is known as nesting.

Look at the following example:

```
<font color = "red">Paragraph text</font>
```

This combination of tags and attributes will display the paragraph text with a red colour. Notice that the tag which is opened first () is closed last (). The tag which is opened second () is closed first ().

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The attributes that can be used with the tag are shown in the table below:

ATTRIBUTE	VALUE	FUNCTION
face	Any valid font name such as Arial or Comic Sans MS	Changes the font that is displayed. The correct name for the font can be found by looking at the Font dropdown in the Font group on the Home tag in MS Word.
color	Any valid colour name such as red, blue or green.	Displays the text in a different colour to the default black. There are 140 standard colour names in HTML.
size	Values ranging from 1 to 6	

Do the following activity to get a better understanding of how to use the tag.

Guided Activity 15.6

1. Type the following code in Notepad++ and save the file as *fonts.html*.

- 2. View the file in a web browser.
- 3. Your web page should look like this:

Fonts

The quick brown fox jumps over the lazy dog

The quick brown fox jumps over the lazy \log

The quick brown fox jumps over the lazy dog

The quick brown fox jumps over the lazy dog

- **4.** If your page does not display correctly, return to Notepad++ and correct your errors.
- Note the following:

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- The colour attribute must be spelled correctly, viz. color
- A list of valid HTML colour names can be found on the W3 Schools website: https://www.w3schools.com/colors/colors_names.asp
- More than one attribute can be used in the same font tag. It is not necessary to have a new
 font> tag for each attribute. The order in which the attributes are added does not matter.

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HORIZONTAL LINES

There are two attributes that can be used for the horizontal lines' appearance. The attributes are added to the <hr / > tag. They are described in the table below:

ATTRIBUTE	VALUE(S)	FUNCTION
size	A number measured in pixels. The unit for pixels (px) does not need to be used. Pixels are the size of the picture elements on the screen. 1 cm is approximately 37,8 pixels.	Changes the height (thickness) of the horizontal. Browsers display a hollow line which can be difficult to see.
width	Either a number in pixels, for example 100 or a percentage, for example 50%.	Changes the length of the line. If the width of the line is given in pixels, the width will stay the same even if the browser window is resized.
		If the width is given as a percentage, the length of the line changes to that percent of the available space. If the browser window is resized, the width of the line will change.

Guided Activity 15.7

1. Type the following code into Notepad++. Save the file as *lines.html*.

```
<html>
    <title>Horizontal Lines</title>
  </head>
  <body>
        <!-- Change width -->
        Horizontal line: Width 100 px
        <hr width = "100" />
        Horizontal line: Width 50%
        <hr width = "50%" />
        <!-- Change size -->
        Horizontal line: Size 5 px
        <hr size = "5" />
        <!-- Change both -->
        Horiztal line: Size 10 px Width 70%
        <hr size = "10" width = "70%" />
  </body>
</html>
```

2. View the file in a web browser. You page should look this:

Horizontal line: Width 100 px	
Horizontal line: Width 50%	
Horizontal line: Size 5 px	
Horiztal line: Size 10 px Width 70%	

... continued

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... continued

3. Resize your browser window. Note that the line where the width is in pixels stays the same while the ones where the width is given as a percentage change size according to the width of the screen.

Note the following:

- It is often difficult to see that the width of the line has changed. You can use CSS to display a solid line.
- Both attributes can be added to a single <hr> tag. The order in which you add the attributes
 does not matter.

BODY BACKGROUND COLOUR

Up until now all the web pages you have created have had a white background colour which is a bit boring. There is a useful attribute that can be used to change the background colour of your web page. This attribute is added to the opening
body tag. See the table below:

ATTRIBUTE	VALUE	FUNCTION
bgcolor	Any valid colour name	Changes the background colour of the page to the one selected. Choose your background colour carefully. People must always be able to read the text on the page.

Guided Activity 15.8

1. Type the following code into Notepad++ and save the file as background.html.

- 2. View the page in a web browser.
- 3. Your page should display with a light yellow background colour.

It is also possible to use a suitable image as the background of a web page. This is done using the background attribute. See the example below:

<body background="w3s.png">

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UNIT

15.4 Putting it all together

In this unit you will be doing an activity where you will apply all the skills you have learned in this chapter.



Activity 15.2

Study the screenshot of a web page below carefully.



- **1.** Open a new file in Notepad++. Save the file as *Act 15_2.html*.
- 2. Add the basic document tags to create a web page. The text "Labrador Retriever" must appear on the browser tab.
- **3.** Using the screenshot as a guide, add tags and attributes to the body to create a web page which is the same as the one in the screenshot.
 - The background colour of the page should be light yellow.
 - There is only one level 1 heading on the page.
 - The main heading uses the Comic Sans MS font.
 - The other headings use the Arial font.
- 4. Save your work regularly and preview it in a browser as you are working.

REVISION ACTIVITY

WRITTEN ACTIVITY

Study the following code:

```
<html>
        <title>Critical information</title>
      </head>
      <body>
        <center>
          <h1>Hello World!</h1>
          A «Hello World!» is any computer program that
          outputs the text «Hello World!» to the user.
          Since this is a relatively easy task, it is often
          the first program that programmers learn to create.
          <h2>History</h2>
          The «Hello World!» program was first included as a
          beginner>s program in a book from 1972 called <i>A
          Tutorial Introduction to the Language B</i>.
        </center>
      </body>
      <h2>Challenges</h2>
      Programmers often like to challenge themselves by finding
      strange and funny ways to code "Hello World", or to create
      it on strange devices, such as calculators.
 </html>
1. Based on the code, answer the following questions in your own words.
  a. What is the title of the page?
                                                                          (1)
  b. How many headings are there on the page?
                                                                          (1)
  c. How many paragraphs of text are there?
                                                                          (1)
  d. What information should be placed in the body section?
                                                                          (1)
  e. Are there any lines of code that should be moved to the body section?
                                                                          (1)
2. Name two elements of an HTML document.
                                                                          (2)
3. Explain the difference between the World Wide Web and a website.
                                                                          (4)
4. Why would you use comments in a web page?
                                                                          (2)
5. Name three advantages of using formatting and structural elements in a web page.
                                                                          (3)
```

... continued

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REVISION ACTIVITY ... continued

PRACTICAL ACTIVITY

- 1. Use a text editor to create a web page using your knowledge of html elements and tags to give some info about *South African School Sports*. Follow the following guidelines to create a web page: (20)
 - Use Notepad to create a document. Save it as an HTML document.
 - The title of the web page is 'School Sports'.
 - Create the following headings:
 - Heading 1: Popular sport codes
 - o Heading 2: Summer sports
 - o Heading 2: Winter sports
 - Heading 3: School policy with regards to sport
 - o All headings must be formatted in bold.
 - All headings must have a horizontal line in between.
 - Write the following paragraphs after each heading:
 - P1: The most popular sports in South African schools are; rugby, netball, athletics, soccer and cricket.
 - P2: In South Africa athletics and cricket are played during the summer months.
 - P2: In South Africa netball, rugby and soccer are played during the winter months.
 - P3: Learners must be accompanied by an educator when they compete against learners from other schools.

Save the web page and view it in a browser.

Total: [36]

AT THE END OF THE CHAPTER

	CAN YOU	YES	NO
1	Describe what HTML is and what it is used for?		
2	Discuss what an HTML editor is?		
3	Define HTML syntax?		
4	Explain the structure and design of a simple HTML page?		
5	Identify and use basic HTML tags, including document and text tags?		
6	Use HTML comments?		
7	Identify and use the correct attributes and syntax for HTML links, images and lists?		
8	Describe the principles of good website design?		



CHAPTER 16

PRINCIPLES OF WEB DESIGN

CHAPTER OVERVIEW

Unit 16.1: HTML and web design

Unit 16.2: HTML links and images

By the end of this chapter, you will be able to:



• Describe the principles of good website design.

INTRODUCTION

Now that you understand the basics of how a website is made, you need to learn about what a website needs to look like. A well-designed website is one that is easy to navigate, easy to read and good to look at.

In this chapter, you will learn about the basics of good web design and how HTML works to make a website look good and be user-friendly. You will also learn about HTML links, images, lists and the correct attributes and syntax for these elements.

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16.1 HTML and web design

Websites have many purposes ranging from providing information to entertainment to e-commerce. You can have the most beautifully designed website in the world, but if it does not provide the information people are looking for quickly and easily, it will not be a good website. This is why good website design is important. A good website is one that looks good, loads quickly and is easy to navigate.

In this unit, you will learn about the basics of good website design and how to use colour and basic text formatting to get the message across as quickly as possible.

GOOD WEBSITE DESIGN

If you wish to design a good website, there are a number of important things that should be considered:

- 1. The purpose of a website impacts on how it is designed. A website that provides information will have a different design to an e-commerce website.
- 2. The website should be good to look at. This includes the layout of website elements, choice of fonts and use of colour. Headings, sub-headings and lists should be used to organise information.
- 3. The content of the website should be up to date and relevant to your target audience. Content should also be original and not plagiarised from another source.
- 4. It should be easy to navigate the site. It must be easy to identify hyperlinks and users should not have to click too many times to get where they need to.

Many people use a mobile device such as a smartphone to view websites. You need to ensure that your website looks as good on a mobile phone screen as it does on a laptop or desktop computer.

DESIGNING A WEBSITE OR WEB PAGE

Page layout is one of the most important aspects of website design. You need to think about how you are going to be arranging the content on it. You need to start with laying out the information correctly and neatly. Placing content on the pages in a random way looks messy. Use a grid-based layout to arrange content into sections.

Most people read from left to right and from top to bottom, so they naturally read things in the shape of a capital letter F. Most of what people see is in the top and left of a screen and the bottom right is very rarely looked at. Make sure the most important information is where people will naturally look first.

You will also need to consider the spacing of the website. Using empty space (or negative space) balances out the page and draws the eye to the most important content. A lot of negative space also makes things look elegant and clean.



Something to know

For a look at how website design has changed since the dawn of the internet age, *A Look Back at 20+Years of Website Design* has several good examples: https://blog.hubspot.com/marketing/look-back-20-years-website-design.

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Compare iPhone models

Find the iPhone that's right for you >

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Figure 16.1: Apple's website uses negative space very effectively

Lastly, each page on the website must look like it belongs with the rest. You should carry specific design elements (like colour, logos and font) through to all the pages.

USING COLOUR

Colour is important in web design. Colour draws the eye and makes important things stand out. Colours should be used to enhance the purpose of your website. Information must be clear and easy to read.

Colours need to be chosen for the background of the page, important information and body text. If the website is providing information about a company or business the colours of the company logo could be used.

If you are designing a website, the colours used should be consistent across different pages. Don't choose a different background colour for each page on your site.

In CAT you will add colour to your website using attributes linked to tags. Most modern websites, however, use Cascading Style Sheets to add colours. If you are interested in finding out more about CSS there are a number of free online courses available.

BASIC TEXT AND TEXT FORMATTING

Finally, you need to think about the text. Ask yourself:

- Will you be using plain text or a specific font?
- How will the text be formatted and where will you use and <i> tags to draw attention to specific things?
- How many heading levels will you have and how big will they be?
- How will the text be spaced out?
- Will the text be a different colour?
- What colour will my links be?

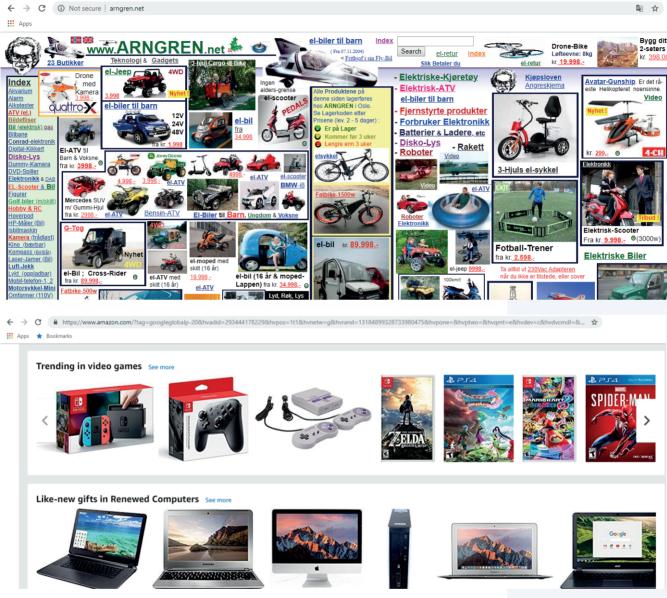
Once you have all of that figured out, you can start creating your website.

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Activity 16.1

Written activity. Look at the screenshots taken from two different online stores. Using your knowledge of good and bad website design, answer the questions below.



- 1. Name four things which make Arngren a badly designed website?
- 2. Explain why the second screenshot of Amazon is a better designed site?
- 3. What could Arngren do to improve on their website design?

16.2 HTML lists, links and images

In this unit you will learn about some new tags which are used to make web pages more interesting. Lists are used to organise information. Images add interest to a web page. Hyperlinks are key to all websites, allowing you to jump to different places with a click of your mouse.

HTML LISTS

You can use lists to organise the information on an HTML page. For example in a word processing program, you can have numbered lists and bulleted lists. Numbered lists are also called ordered lists and bulleted lists are called unordered lists. The tags used to create these elements are described in the table below:

TAG	FUNCTION	
	Displays a bulleted (unordered) list on the page.	
<01> 01	Displays a numbered (ordered) list on the page	
	Each item in the list must be enclosed in a pair of <1 i > 1 i tags.	

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Guided activity 16.1

1. Type the following code into Notepad++ and save the file as *lists.html*.

```
<html>
<head>
<title>Shopping List</title>
</head>

<body>
<h2>Shopping List</h2>

Milk
Cheese
Eggs
</body>
</html>
```

2. View the file in a web browser.

Shopping List

- Milk
- Cheese
- Eggs

... continued

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... continued

- 3. Note how the 1 i > tags are nested inside the <u1 > tags as well as the use of indentation. This is done to ensure that the HTML is easy to read.
- **4.** Replace the tag with and the tag with . Save the file and view the results in a browser.

Shopping List

- 1. Milk
- 2. Cheese
- 3. Eggs
- 5. Notice how the bullets have changed to numbers.

There is an attribute, called *type* which can be used to change the type of bullet or the type of number used in a list. The values which can be used with the type attribute are described in the table below:

UNORDERED LISTS ()				
Attribute	Value	Function		
type	disc	Changes the bullet to an open circle		
	square	Displays a square bullet		
	circle	Display a bullet which is a solid circle. This is the default value which is displayed if the type attribute is not used.		

NUMBERED LISTS (<0L>)				
Attribute	Value	Function		
type	1	Displays a list numbered from 1 onwards. This is the default attribute which does not have to be used.		
	А	Displays an alphabetical list with uppercase letters, e.g. A., B., C.,		
	а	Displays an alphabetical list with lowercase letters, e.g. a., b., c.,		
	1	Displays a list using uppercase Roman numbers, e.g. I, II, III,		
	i	Displays a list using lowercase Roman numerals, e.g. i, ii, iii,		

There are two other attributes which can only be used with ordered lists, *reversed* and *start* which you can find out about if you want.



Guided activity 16.2

- 1. Open the file *lists.html* which you saved in Guided Activity 16.1.
- 2. Make the changes below to the HTML code and save the file:

```
<html>
<head>
<title>Shopping List</title>
</head>

<body>
<h2>Shopping List</h2>

Milk
Cheese
Eggs
</body>
</html>
```

- 3. View the code in a web browser. Notice how the bullet has changed to a square shape.
- **4.** Change the value of the type to "disc". Save the file and view the results in a browser. Notice how the bullet has changed to an open circle.
- **5.** Change the unordered list to and order list.
- **6.** Change the type attribute to display a numbered list like the one below. Save the file before viewing in a browser.

i. Milk ii. Cheese iii. Eggs

7. Experiment with different values of the type attribute and view the results in a browser.

HTML LINKS

The ability to use hyperlinks to move easily from one place in a document to another or from one document to another is one of the reasons the HTML markup language was created. In this section we will show how to:

- Link to another website or another page in a website
- Link to a file

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• Link to a different place in the same document.

All HTML links are hyperlinks, meaning that they allow you to jump from page to page in a document or to another document entirely. When you move your mouse over a link, the cursor changes from an arrow into a small hand with a pointing finger.

Regardless of what type of link it is, all links follow the same basic structure, for example:

```
<a href="http://www.facebook.com">This is the link</a>
```

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The tag for links is called the *anchor tag* and it does have an opening tag and a closing tag, it just looks slightly different than all the other tags you have seen so far. Without the destination address and the reference in it the anchor tag is <a>.

The "href" attribute inside the opening anchor tag specifies the destination address (the URL) of the link, telling the browser where to take you if you click on it. The destination address must always be in double quotation marks ("_").

The text between the tags is called the *anchor text*. This text should be highlighted in some way so that users of the page know where to click. The following are the default colours used in all browsers:

- Blue and underlined for an unvisited link
- Purple and underlined for a visited link
- Red and underlined for an active link (this happens when you click on the link)

These colours can be changed using CSS.

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Guided activity 16.3

1. Type the code below into Notepad++. Save the file as *links1.html*.

- 2. View the page in a browser.
- 3. Click on the word link, which should be blue and underlined. Make sure the W3 Schools webpage opens correctly. If not, check that you did not making a typing error.

In the previous Guided Activity, you will have noticed that the new web page replaced the web page you were viewing. You must click the *Back* button on the browser to go back to where you were. Many users find this annoying. To force the new website to open in a new tab on your browser, the *target* attribute is used.

```
<a href="http://www.google.co.za target = "_blank">Go to Google</a>
```

There are a few other values for the target attribute which are sometimes used in older websites. It is not necessary for you to know them.

If a web page contains a lot of information, links are often used to jump from one part of the page to another. These are called internal links.



Something to know

The < and > are special codes (called attributes) which are used in HTML to display a less than sign (<) and a greater than signs (>). If you type <a> into HTML, the browser is expecting a hyperlink and will not display the <a> correctly.

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Creating an internal link is done in two steps.

1. Create the place you want to jump to by making a bookmark:

```
<a id="Place">Bookmark text</a>
```

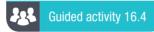
The *id* attribute is used to give the bookmark a name. The bookmark name should be a single word and must not contain spaces. In older versions of HTML the attribute *name* was used instead of *id*. You can replace the *id* attribute with *name* without affecting your webpage.

2. Add a hyperlink to the bookmark at the place you wish to jump from:

```
<a href="#Place">Go to Place</a>
```

The bookmark name has a # in front of it. "Go to Place" will be the anchor text and will be blue and underlined.

In the following Guided Activity, we will learn how to create internal links.



- 1. Open the file *links2.html*, which you will find in your data folder, in Notepad++.
- 2. Change the level 2 heading "Part Two" as follows:

```
<h2><a id="Part2">Part Two</a></h2>
```

- 3. Save the file and view it in a browser. You should not notice any change.
- **4.** Make the following changes to the top of the document:

```
<h1>Links to a place on the same page</h1>
Go to <a href="#Part2">Part 2</a>
<h2>Part One</h2>
```

- 5. Save the file and view it in a browser. Click on the hyperlink "Part 2" which you have just created and observe what happens. You might need to make the browser window smaller to better see what happens.
- 6. Add a bookmark to the level two heading "Part Three". Call the bookmark id "Part3".
- **7.** Add the paragraph with text "Go to Part 3" under the paragraph you added in Question 4. Hyperlink this paragraph to the "Part3" bookmark.
- 8. Save the file in the browser and ensure that the hyperlink works correctly.

HTML IMAGES

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Images can add to the design and appearance of a web page. Images also have their own unique syntax, starting with their tag. Images are defined with the tag. This tag is empty, meaning it does not have a closing tag. To see how an image is specified in HMTL, look at the example below:

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The image tag is a map of where the image fits on a page since images are not technically inserted directly into an HTML page. Rather, images are linked to a folder (either the same one as the page or a sub-folder) or to a server or website. The tag creates a holding space for the referenced image.

The image tag is an example of what is known as an inline element. Text and other elements wrap around the image.

There are two attributes that should be used for every image:

Source (src)

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Alternate text (alt)

The source attribute indicates where an image is stored. This is either the folder on the website or another website or server. You need to specify where the image is stored in order for it to display. You also must give the correct file extension, e.g. jpg or bmp. For example, the src attribute below indicates the pictures folder on a website:

The alt attribute gives alternate text for an image. This is a short description of what the image shows so that if a user cannot view the image because the file is no longer available, or they are using a screen reader, they can still know what the image looks like.

There are other attributes which can be used with the img tag. They are described in the table below:

ATTRIBUTE	VALUE(S)	FUNCTION		
height	A number (in pixels)	Allocates the size needed for the height of the image before it is loaded.		
width	A number (in pixels)	Allocates the size need for the width of the image before it is loaded.		

If the value of only one of *height* or *width* is specified, the browser will adjust the other attribute so that the image's aspect ratio stays the same. If you specify both values, you must be careful to not distort the image by changing the aspect ratio.

ATTRIBUTE	VALUE(S)	FUNCTION
align	left	Aligns the image on the left of the page. This causes text (and other elements) to wrap around the right-hand side of the image.
	right	Aligns the image on the right of the screen. The causes text (and other elements) to wrap around the left-hand side of the image.
	top	Aligns the top of the image with surrounding elements
	middle	Aligns the middle of the image with surrounding elements
	bottom	Aligns the bottom of the image with surrounding elements

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Note that the value "center" does not work with an image. An image can, however, be centred using the <center> tag introduced in Chapter 15. See the example below:

<center></center>

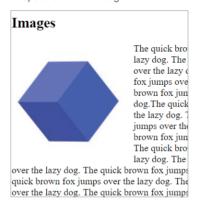


Guided activity 16.5

- 1. Open the file *images.html* in Notepad++.
- 2. Type in the following code underneath the heading "Images":

- **3.** Save the file and view it in a browser. The image should appear under the heading and the following paragraph starts under the image.
- 4. Add align="left" to the image tag:

Save the file and view in the browser. The image is now on the left of the screen and the text wraps around the image.



- 5. Now change the value of the align attribute to "right". Save the file and view in browser. Take note of the result.
- 6. Add the code immediately after the first tag.

```
<img src="tinycube.jpg" align="top" alt="A small cube" />The
quick brown fox jumps over the lazy dog. The quick brown fox
jumps over the lazy dog. The quick brown fox jumps over the lazy
```

- 7. Save the file, view in the browser and take note of what happens. Now change the value of the align attribute to "middle". Save the file again. View it in the browser and take note of how the position of the image changes.
- 8. Finally change the value of align to "bottom". Save the file and view the changes.

REVISION ACTIVITY

A web page has been created to give some first-hand information to visitors who are totally unaware of uShaka Marine World and the unlimited fun it has in store for them.

Open the incomplete uShaka web page in a web browser and also in a text editor, e.g. Notepad.

NOTE: Question numbers are inserted as comments in the coding as guidelines to show approximately here the answer(s) should be inserted.

... continued

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REVISION ACTIVITY ... continued

The final web page should look like the example below.

Unlimited Fun for EVERYONE!

Chimp & Zee Rope Adventure:

- Longest belay system in the world two levels of difficulty (intro (18 elements) and intermediate (17 elements) including)
 2 exciting zip lines over Rocky Reef and the turtle enclosures.

Wet n wild:

17 slides including highest slide in the southern hemisphere

Sea World:

- A. Africa's leading morine education Facility
 8. \$4.8 only Dolphin Show
 C. Gambit effhelwin'i Living Legend
 D. Largest aquarium in the southern hemisphere extending \$00 meters through four ship wrecks

Dangerous Creatures:

- New Black throated monitors aka The Dragons
 Burmese Python Photo Opportunity

Kids World

- Feathered Friends Parrols Sulphur Crested Cockatoos, Green Wing and Blue & Gold Macaws
- · Africa's largest jungle gym

For more information, call 031 328 8000 Or Visit

www.ushakamarineworld.co.za



- 2. Change the background colour of the web page to yellow. (1)
- 3. Change the font of the whole web page to Century Gothic. (2)
- 4. Correct the HTML code to display the heading "Unlimited Fun for EVERYONE!" in heading 1 style. (1)
- 5. Insert a horizontal line after the heading "Unlimited Fun for EVERYONE!" and before the last line of the web page starting with "For more information ..."
 - The colour of the horizontal lines should be red.
 - The size should be 4. (3)
- **6.** Locate the items under the heading Sea World. Make the following changes:
 - Display it as an ordered list.
 - The list should be in the format A,B,C. (2)
- 7. Insert the image Fun Unlimited.jpg before the heading "Wet 'n Wild" and do the following:
 - Set the height of the image to 50% and width to 25% respectively.
 - Align the image to the right.
 - Insert an alternative text to display Unlimited Fun if the image does not display.
- 8. Display the sentence "call 031 328 8000" found at the bottom of the web page to be italics. (1)
- 9. Link the web address found at the bottom of the web page that reads www.ushakamarineworld.co.za to the same web address.

Total: [20]

(2)

AT THE END OF THE CHAPTER

	CAN YOU	YES	NO
1	Identify and use the correct attributes and syntax for HTML links, images and lists?		
2	Describe the principles of good website design?		

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