Develop and use complex spreadsheets (Excel 2016)

This workbook supports BSBITU402 Develop and use complex spreadsheets in the BSB Business Services Training Package.

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Disclaimer

BSBITU402 Develop and use complex spreadsheets

Application

This unit describes the skills and knowledge required to use spreadsheet software to complete business tasks and produce complex documents.

It applies to individuals employed in a range of work environments who require skills in creation of complex spreadsheets to store and retrieve data. They may work as individuals providing administrative support within an enterprise, or may be independently responsible for designing and working with spreadsheets relevant to their own work roles.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Elements and Performance Criteria

Element *Elements describe the essential outcomes.*	Performance Criteria *Performance criteria describe the performance needed to demonstrate achievement of the element.*	Page reference
1. Prepare to develop spreadsheet	1.1 Organise personal work environment in accordance with ergonomic requirements	Software Publications WHS supplement
	1.2 Analyse task and determine specifications for spreadsheets	23–43
	1.3 Identify organisational and task requirements of data entry, storage, output, reporting and presentation requirements	23–40
	1.4 Apply work organisation strategies and energy and resource conservation techniques to plan work activities	Software Publications WHS supplement
2. Develop a linked spreadsheet solution	2.1 Utilise spreadsheet design software functions and formulae to meet identified requirements	Throughout workbook
	2.2 Link spreadsheets in accordance with software procedures	137–139
	2.3 Format cells and use data attributes assigned with relative and/or absolute cell references, in accordance with task specifications	Throughout workbook
	2.4 Test formulae to confirm output meets task requirements	81–88
3. Automate and standardise spreadsheet operation	3.1 Evaluate tasks to identify those where automation would increase efficiency	194–205, 210–219
	3.2 Create, use and edit macros to fulfil requirements of task and automate spreadsheet operation	191–205
	3.3 Develop, edit and use templates to ensure consistency of design and layout for forms and reports, in accordance with organisational requirements	210–219

Element *Elements describe the essential outcomes.*	Performance Criteria *Performance criteria describe the performance needed to demonstrate achievement of the element.*	Page reference
4. Use spreadsheets	4.1 Enter, check and amend data in accordance with organisational and task requirements	Throughout workbook
	4.2 Import and export data between compatible spreadsheets and adjust host documents, in accordance with software and system procedures	220–223
	4.3 Use manuals, user documentation and online help to overcome problems with spreadsheet design and production	20, 39, 66–68
	4.4 Preview, adjust and print spreadsheet in accordance with organisational and task requirements	Throughout workbook
	4.5 Name and store spreadsheet in accordance with organisational requirements and exit application without data loss or damage	Throughout workbook
5. Represent numerical data in graphic form	5.1 Determine style of graph to meet specified requirements and manipulate spreadsheet data if necessary to suit graph requirements	95–98, 110
	5.2 Create graphs with labels and titles from numerical data contained in a spreadsheet file	100–120
	5.3 Save, view and print graph within designated timelines	100–120, 227–229

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description	Page reference
Reading	1.2, 1.3, 2.3, 2.4, 3.1, 3.3, 4.1-4.5, 5.1, 5.2	• Recognises and interprets numerical and textual information within a range of sources to determine and complete work according to requirements	Throughout workbook
		• Reviews information to determine accuracy and consistency	Throughout workbook
Writing	2.1-2.4, 3.2, 3.3, 4.1, 4.2, 4.4, 4.5, 5.2, 5.3	• Uses formal mathematical language to create formulas and enters routine data using a format appropriate to requirements	Throughout workbook
		• Develops material using syntactic structure, required format and incorporating technical functions to meet business needs	Throughout workbook
Oral communication	1.2	• Uses listening and questioning skills to clarify requirements	24, 26, 46, 178
Numeracy	2.1-2.4, 3.2, 4.1, 4.2, 5.2	• Represents mathematical information in an alternative form and analyses information to determine required spreadsheet formulae and macros	Throughout workbook
Navigate the world of work	1.1, 1.3, 1.4, 2.1-2.4, 3.2, 3.3, 4.1, 4.2, 4.4, 4.5, 5.1, 5.3	• Recognises and follows explicit and implicit protocols and meets expectations associated with own role	Throughout workbook
Get the work done	1.2, 1.4, 2.1-2.4, 3.2, 3.3, 4.1-4.5, 5.1-5.3	• Applies formal processes when planning more complex/unfamiliar tasks, producing plans with logically sequenced steps	23–34
		• Uses formal thinking techniques to generate new ideas	Throughout workbook
		• Uses advanced features within applications to access, store, organise data and perform routine and complex work tasks	Throughout workbook

Assessment for this Unit

This Unit is assessed by:

- observation of good WHS practices
- creating a timeline
- planning and creating spreadsheet templates
- creating spreadsheets
- using a manual or help facility.

Assessment Requirements v1.0

Performance Evidence

Evidence of the ability to:	Page reference
- follow organisational and safe work practices including: - ergonomic requirements - energy and resource conservation techniques	Software Publications WHS supplement
- adhere to organisational requirements for: - ensuring consistency of style, design and layout	25, 37, 44–47
- saving and printing documents within designated timelines	18–19, 227
- naming and storing documents	18, 210
- adhere to identified or task requirements when producing documents including: - editing macros and automating some tasks - using appropriate templates - creating graphs to represent data	Throughout workbook
- resolve issues by referring to user documentation and online help	20, 39, 66–67
- use appropriate data storage options	Throughout workbook
- evaluate tasks to improve efficiency	191–205, 210–219
- apply knowledge of functions and features of contemporary computer applications	Throughout workbook
- communicate with relevant personnel.	24, 46, 178, 226

Knowledge Evidence

| To complete the unit requirements safely and effectively, the individual must:	Page reference
- explain advanced functions of spreadsheet software applications	Throughout workbook
- describe impact of formatting and design on presentation and readability of data	36–38, 46, 226
- explain organisational requirements for ergonomics, work periods and breaks, and conservation techniques.	Software Publications WHS supplement

How to use this workbook

What you need

You will require a USB memory stick or folder on your computer hard drive or network to store files you create while completing this workbook. This will be referred to in exercises as your **working folder**. Check with your trainer or workplace supervisor to determine the appropriate storage location if required.

To save to the Documents folder

Click on Documents under This PC.
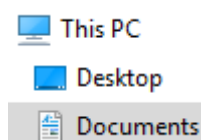
To save to a USB memory stick

Check your USB memory stick is connected. Select the USB memory stick from under This PC. Your USB memory stick will be labelled as USB drive, Removable Disk or a manufacturer's allocated name.

To save to a network drive

If you are on a network, the drive(s) will be listed under ⟩ 🖥 Network in the Navigation Pane. Consult with your trainer, supervisor or network administrator to check you are saving to the correct network location.

Spelling and grammar in this workbook

At times different spellings of one word are used in this workbook.

References to buttons, groups, tabs and other features are used in the same way as they appear in the application so instructions resemble the application as closely as possible.

In all other instances Australian spelling is followed.

   For example, the Font Color button is used to change the colour of selected text.

   The Percent Style button is used to apply per cent format.

Images used in this book

Your monitor size and resolution will determine how your version of Word 2016 will display. There will be variation in the number of buttons shown on the Ribbon and the format of some buttons. For example on a bigger screen the Copy button has text on it 📋 Copy whereas on a smaller screen it displays as 📋, therefore sometimes your screen or buttons may vary from those shown.

Software Publications WHS

A document titled **Software Publications WHS supplement** has been included in the downloaded files. Read this document before continuing with this workbook.

Spreadsheet design

Before you can create your spreadsheet you need to work out exactly what the spreadsheet needs to do, the sort of data that will be entered and the way it will be laid out. The spreadsheet may need to:

- produce numerical information

- display data in a chart

- allow others to access the data for use in their own spreadsheets

- allow many different users of different abilities to input data and produce output from your spreadsheet.

There are some rules that need to be taken into account when designing a spreadsheet. Failure to follow them will result in, at best, a difficult spreadsheet to use and, at worst, a spreadsheet producing erroneous results.

Every spreadsheet you produce should have the characteristics listed below.

Accuracy	If the numbers in your spreadsheet or the calculations you set up are wrong then the results and your conclusions will be incorrect. This is a simple case of GIGO (garbage in, garbage out).
Clarity	If someone else will be looking at your spreadsheet they must be able to quickly see the numbers in which they are interested and how the results have been achieved. If the spreadsheet requires editing, the user will want to be able to quickly and easily see how the data is arranged and what figures need changing.
Flexibility	Will you want to change the spreadsheet design?
	Is it being set up to solve an existing problem or are you developing it as you work at the problem?
	Is the spreadsheet going to solve a sequence of similar problems?
	Even if you do not think you will need your spreadsheet to do any more than solve a current problem, a spreadsheet that is flexible so that it can be easily changed is well worth having.
Efficiency	Some spreadsheets can be laid out to minimise the time it takes to number crunch the calculations. If you have a very large spreadsheet, this may be worth looking at; however, it is probably more worthwhile to look at how easy the spreadsheet is to use for yourself.
	Can you find the areas you want to work on easily?
	Is entering the data as simple a process as it can be?
Auditability	The results that the spreadsheet produces are only as good as the numbers and the calculations that produce them.
	Is it easy to prove to someone else that you have got your calculations right in the spreadsheet?
	If an error did occur would you be able to locate it quickly?
	When you design your spreadsheet make sure you either know or can easily find out what is going on in the spreadsheet at any stage.

Using spreadsheets to solve problems

Spreadsheets are used to solve problems and answer questions involving figures. Some scenarios where spreadsheets can be used to solve problems or answer questions are described below.

Scenario 1

You have been given a list of sales made in March by all the staff members in the sales department. The accountant needs to know the total sales for each staff member and the total for the sales department. The sales manager wants to find out which product sold the best and which staff member made the most sales. You have also been asked to calculate the average sales for the month.

Scenario 2

You are saving up to buy a new car and you can afford to save $100 per week. The interest rate for your savings account is 5.5%. How long would it take to save for a car worth $4,000?

Scenario 3

As a teacher you have to keep track of student progress. The students have four exams throughout the year, which are the basis for the total mark for the year. The first exam has a maximum grade of 35, which is 35% towards the total mark for the year. The second exam has a maximum grade of 15, which is 15% towards the total mark for the year. The third and fourth exams have maximum grades of 25 for each exam, which is 50% towards the total mark for the year. You need to calculate the total mark for each student and give a statistical summary for the class.

Working through a scenario process

Martin is the accountant for Smith and Jones Ltd. He needs to find out the gross profit from the manufacture of different types of pens. Gavin has given him a breakdown of the costs to manufacture each pen.

Martin has asked Erica from Sales for a distributor price list of each pen to help him work out the gross profit. The results are required to be displayed in chart format so Martin can show the general manager the difference in the sell price and production cost for each pen.

Martin

Here are the costings for the pens you asked for.

	Streamline	Professional	Artie	Master
Refills	0.80	1.50	1.00	1.10
Spring	0.50	0.50	0.50	0.50
Case	1.10	2.00	0.80	1.50
Labour	1.00	1.00	1.00	1.00

Gavin

Martin

As promised, here is the latest price list for distributors.

Pen	Distributor's cost price	Retail price
Streamline	$5.00	$7.00
Professional	$7.00	$9.00
Artie	$6.00	$8.00
Master	$7.50	$8.50

Erica

Questions Martin might ask himself could include the following:

1. Which two headings could I use for this spreadsheet?

    Smith and Jones Ltd.

    Gross profit (per pen)

2. What result needs to be achieved?

    The difference between sell price to distributors and production costs for each pen, i.e. the gross profit.

3. What column headings are required?

    Column headings for each pen, i.e. Streamline, Professional, Artie, Master.

4. What would I use for row headings?

    Selling price, then production costs.

5. What calculations are required?

    Total production costs.

    Selling price minus total production cost = gross profit.

Final spreadsheet
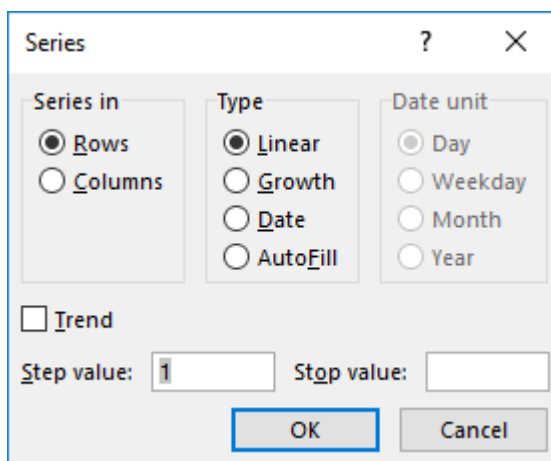
	A	B	C	D	E
1	**Smith and Jones Ltd**				
2	*Gross profit (per pen)*				
3					
4		Streamline	Professional	Artie	Master
5	Selling price	5.00	7.00	6.00	7.50
6					
7	**Production costs**				
8	Refils	0.80	1.50	1.00	1.10
9	Spring	0.50	0.50	0.50	0.50
10	Case	1.10	2.00	0.80	1.50
11	Labour	1.00	1.00	1.00	1.00
12	**Total production costs**	3.40	5.00	3.30	4.10
13					
14	Gross profit	1.60	2.00	2.70	3.40
15					

Smith and Jones Ltd
Selling price and total production cost

Series

The Series command fills a range of cells with a sequence of values. This is useful to quickly insert numbers, e.g. numbers from 1 to 10, or enter dates, e.g. Jan to Dec.

A series range starts with a number or date value and increases by a set step value until a stop cell is reached. A series can be entered by using the Fill handle OR by clicking on the Fill button ⬇ Fill ▾ from the Editing Group on the Home Ribbon and selecting Series.

Series in	Select *Rows* to fill the series across selected rows or select *Columns* to fill down selected columns.
Type	Select the type of series required.
Date unit	If Date is selected in the Type section, the date increments by Day, Weekday, Month or Year are selected in the Date unit section.
Step value:	The amount by which a series is increased or decreased. A positive number will increase a series and a negative number will decrease a series.
Stop value:	The value that ends a series.

Fill Series options

| Description	Instruction
To insert incremented number values	1. Select the number value cells. 2. Hold down the Ctrl key and drag on the Fill handle.
To define step and stop units, i.e. where a fill starts and stops	1. Select the value cells and the range to be filled. 2. Click on ⬇ Fill ▾ Series. 3. Click in the *Stop value:* box and enter the value. 4. Select the type of fill required. Click on OK.
To insert incremented dates and formulas	1. Select the value cells. 2. Click and drag on the Fill handle. OR 1. Select the value cells and the range to be filled. 2. Click on ⬇ Fill ▾ Series. Select AutoFill and click on OK.

Help

You can display the Excel Help pane by:

- Pressing F1.

- Clicking on the Help button in a dialog box ? . The pane will display Help articles specific to that dialog box.
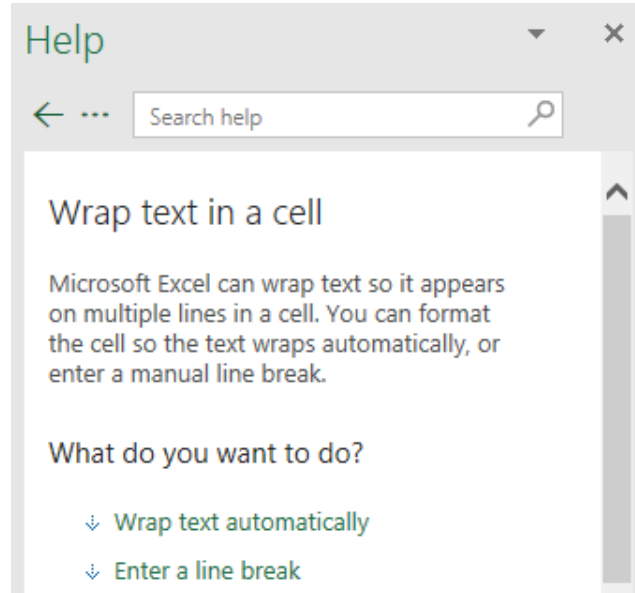

When the mouse is positioned over some of the Ribbon buttons, the screen tip displays a **Tell me more** button. Click on the button to display Help articles specific to that command.
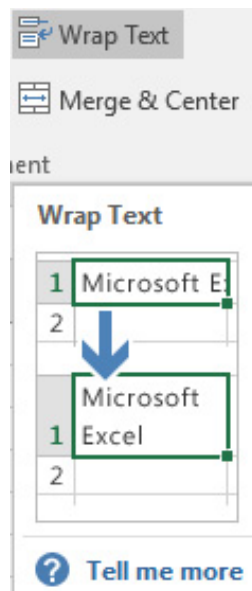
To use the Help facility:

1. Enter a search term into the Search topic box and click on the Search button. The results will be displayed.

2. Click on a topic in the Results screen to display help information on that topic.

3. Once you have visited a topic, click on the Back button ← on the Excel Help toolbar to return to the list of results.

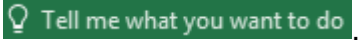4. To close the Excel Help pane, click on ✕ at the top right of the pane.

Exercise 12

1. With the Excel screen displayed, press F1. The Help pane will display.

2. Type: **columns** into the Search topic box and press Enter.

    The search result topics/subjects will be listed in main window area.

3. Click on one of the topics listed in the Results screen, e.g.
    Insert or delete cells, rows, and columns . Information on the topic will display.

4. Click on ← to return to the list of results.

5. Click on ← again to return to the Help home screen.

6. Click on the Close button ✕ at the top right of the Excel Help Pane.

7. On the Insert Ribbon hold the mouse pointer over the Header & Footer button . A Screen Tip will display with a short explanation Header & Footer. Click on
    ❓ Tell me more at the bottom of the Screen Tip.

8. The Excel Help Pane will open displaying content relating to headers and footers.
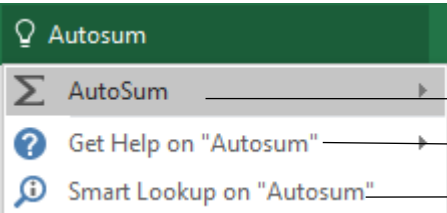
9. Click on ✕ to close the Excel Help window.

Tell Me

The Tell Me box is positioned to the right of the Ribbon tabs 💡 Tell me what you want to do .

Tell Me can be used to:

*   open a tool quickly

*   get help on a topic

*   ask a research question.

Type a keyword into the Tell Me box, e.g. **Autosum**. Options for that keyword will display.

Inserts a Sum formula into the worksheet

Displays help information on the AutoSum function

Opens Smart Lookup with a definition of the term AutoSum.

Evidence guide

Elements and Performance Criteria

Element *Elements describe the essential outcomes.*	Performance Criteria *Performance criteria describe the performance needed to demonstrate achievement of the element.*	Assessment tasks
1. Prepare to develop spreadsheet	1.1 Organise personal work environment in accordance with ergonomic requirements	Task 1
	1.2 Analyse task and determine specifications for spreadsheets	Tasks 3 and 5
	1.3 Identify organisational and task requirements of data entry, storage, output, reporting and presentation requirements	Tasks 3 and 5
	1.4 Apply work organisation strategies and energy and resource conservation techniques to plan work activities	Task 1
2. Develop a linked spreadsheet solution	2.1 Utilise spreadsheet design software functions and formulae to meet identified requirements	Tasks 3–6
	2.2 Link spreadsheets in accordance with software procedures	Task 6
	2.3 Format cells and use data attributes assigned with relative and/or absolute cell references, in accordance with task specifications	Tasks 3–6
	2.4 Test formulae to confirm output meets task requirements	Task 7
3. Automate and standardise spreadsheet operation	3.1 Evaluate tasks to identify those where automation would increase efficiency	Tasks 3–6
	3.2 Create, use and edit macros to fulfil requirements of task and automate spreadsheet operation	Tasks 3, 4 and 7
	3.3 Develop, edit and use templates to ensure consistency of design and layout for forms and reports, in accordance with organisational requirements	Tasks 3–6

Element *Elements describe the essential outcomes.*	Performance Criteria *Performance criteria describe the performance needed to demonstrate achievement of the element.*	Assessment tasks
4. Use spreadsheets	4.1 Enter, check and amend data in accordance with organisational and task requirements	Tasks 4 and 8
	4.2 Import and export data between compatible spreadsheets and adjust host documents, in accordance with software and system procedures	Tasks 3 and 6
	4.3 Use manuals, user documentation and online help to overcome problems with spreadsheet design and production	Task 7
	4.4 Preview, adjust and print spreadsheet in accordance with organisational and task requirements	Tasks 4 and 8
	4.5 Name and store spreadsheet in accordance with organisational requirements and exit application without data loss or damage	Tasks 1 and 3–6
5. Represent numerical data in graphic form	5.1 Determine style of graph to meet specified requirements and manipulate spreadsheet data if necessary to suit graph requirements	Task 5
	5.2 Create graphs with labels and titles from numerical data contained in a spreadsheet file	Task 6
	5.3 Save, view and print graph within designated timelines	Task 8

Assessment Requirements v1.0

Performance Evidence

Evidence of the ability to:	Assessment task

• follow organisational and safe work practices including:
   • ergonomic requirements
   • energy and resource conservation techniques
	Task 1

• adhere to organisational requirements for:
   • ensuring consistency of style, design and layout
   • saving and printing documents within designated timelines
   • naming and storing documents
	Tasks 2–8

• adhere to identified or task requirements when producing documents including:
   • editing macros and automating some tasks
   • using appropriate templates
   • creating graphs to represent data
	Tasks 3–7

• resolve issues by referring to user documentation and online help	Task 7
• use appropriate data storage options	Tasks 3–6
• evaluate tasks to improve efficiency	Tasks 3 and 5
• apply knowledge of functions and features of contemporary computer applications	Tasks 3–7
• communicate with relevant personnel.	Tasks 3 and 5

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:	Assessment task
• explain advanced functions of spreadsheet software applications	Tasks 3, 5 and 7
• describe impact of formatting and design on presentation and readability of data	Tasks 3 and 5
• explain organisational requirements for ergonomics, work periods and breaks, and conservation techniques.	Task 1