FSKNUM018
Collect data and construct routine tables and graphs for work

Release 1

Learner guide

Aspire
Learning Resources

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Aspire Version 1.1

Learning Resources

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Jenni Welch is a freelance writer and project consultant who specialises in VET. She has substantial industry experience as a publisher, shaping and writing resources for a range of VET and other vocational qualifications here and in the UK. She has a post-graduate qualification in education and a masters-aligned accreditation in Digital Learning. She also has a Certificate IV in Training and Assessment and adds her training skills to her passionate commitment to literacy and effective communication.

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FSKNUM018 Collect data and construct routine tables and graphs for work, Release 1

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First published April 2020

Cover design: Anne-Marie Reeves Design
Printer: Doculink Australia Pty Ltd, 1d/28 Rogers Street, Port Melbourne VIC 3207

e-ISBN 978-1-76075-633-8 (PDF version)
ISBN 978-1-76075-632-1

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Contents

Before you begin

This learner guide is based on the unit of competency *FSKNUM018 Collect data and construct routine tables and graphs for work,* Release 1.

How to work through this learner guide

Your trainer or assessor will tell you which parts of the learner guide you need to read, and which activities you need to finish. The learner guide has the following parts.

Part	How you use it
Learning content	Read each topic. If you do not understand something, talk to your trainer.
Examples	This learner guide has examples of completed documents that may be used in a workplace.
Video clips	Where you see a QR code, you can use a smartphone or tablet to access video clips about the content. For information about how to download an app that will read the QR code or for more help, please visit our website: www.aspirelr.com.au/help. 
Learning checkpoints	Complete learning checkpoints to make sure you understand what you have read. Your trainer will tell you which activities to do.
What you have learned	At the end of the learner guide, there is a list of what you have learned. You can use this to check if you are ready for the final assessment.

Words to remember

As you read the learner guide, use this section to write down words you need to remember.

There is a space for you to write the word and a space for you to write down what the word means.

This will help you to learn the words.

Word	What it means

Word	What it means

Your story

You've just started work as a sales and marketing assistant for an online shoe retailer, Walk this way.

Their products are Australian made and growing in popularity, with almost a quarter of their orders coming from outside of Australia.

You report to the sales and marketing coordinator, Lucy. Lucy tells you about the tasks you will do when working with his team. Tasks are things you need to do in your job.

Your tasks

Learn about your tasks below.

Obtain data for sales and marketing reports

Understand what data you need and where to get it from.

Organise and sort the data for the reports

Organise the data and produce graphs as required for the sales and marketing reports.

Add the data and graphs to the sales and marketing reports

Add your sales and marketing data and graphs to the reports.

Participate in a sales and marketing meeting

Present the data in the meeting and answer any questions about the data.

Day 1

Lucy explains that your role will be to support her preparing marketing campaigns and producing sales and marketing reports.

Lucy assures you that she will help you put together the data for your first sales and marketing report. She explains that the first step involves collecting the required data.

What is data?

Data is a collection of facts – such as numbers, words, measurements, observations or even just descriptions of things.

Data can be qualitative or quantitative.

Qualitative data describes something. For example, you could ask your friends what their favourite holiday would be. Their responses would be qualitative data.

Quantitative data uses numbers. For example, if you measured the height of everyone in your family, this would give you quantitative data.

Almost all daily work activities generate data. These could include the:

- Number of employees
- Number of hours worked by employees
- Total amount employees are paid
- Number of products sold per day
- Amount of money generated by products sold
- Number of customer orders per day
- Number of customer queries.

Most workplaces will collect this type of data using the information systems they have in place. This may include payroll, accounting software, ecommerce software and customer relationship management (CRM) software.

Why is data collected?

Data is collected for a variety of reasons.

There are legal reasons for collecting data, such as reporting income to the tax office.

Data is also collected to provide information about what has happened. Analysing the data allows people to make sensible guesses (predictions) about what might happen.

For example, Walk this way will look at the amount of shoes they sell during their busiest sales times. This ensures there is enough stock available to meet customer orders leading into the next busy sales period. In this example, the data will help the company make a decision about how much stock they need.

The purpose of data collection

Data may be collected as part of the business function of the business. Walk this way's ordering system captures a shoe order so they can provide a customer with the shoes they want. However, this data can be used to tell the company many things.

Look at the sales data for their brown ladies sandals sold last year:

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Units	120	100	80	40	20	15	15	15	30	80	120	200

From this sales data, we understand that:

- December is the most popular month to buy these shoes
- These shoes are not as popular during winter months
- A total of 835 pairs of this shoe were sold last year.

The purpose of the data will depend on who is using the data and what they need it for.

Who uses data?

You've already learnt that data can be collected for many reasons and serve many purposes.

The data that is generated will serve different purposes depending on who is using the data.

For example, Walk this way can use the sales data of one shoe to:

- Ensure they have enough stock for spring and summer demand
- Compare sales to previous years to see if demand is growing or slowing
- Compare sales of this type of shoe to others
- Determine if marketing campaigns have been successful in promoting this shoe.

The audience for this data will vary. This is summarised in the following table:

Data purpose	Who uses it
Ensure there is enough stock for spring and summer demand.	• Production and warehouse teams
Compare sales to previous years to see if demand is growing or slowing.	• Marketing team • Product design team
Compare sales of this type of shoe to others.	• Product design team • Marketing team
Determine if marketing campaigns have been successful in promoting this shoe.	• Marketing team

The production and warehouse team are not interested in knowing how well the marketing campaign performed or how well this shoe sells compared to another type. They just want to ensure they can produce and stock enough of the shoe to meet demand throughout the year.

This is why it is important to know who you are preparing the data for, so you provide them only with the information they need to make decisions.

Data sources

You have already learnt that most workplaces will collect data using the information systems they have in place.

Other sources of data may include website reports from Google Analytics or marketing campaign data from marketing platforms, such as Hootsuite or Campaign Monitor.

These information systems generate data and reports based on the needs of the business. Each system varies, and so do the business needs. This is why it is vital that you generate the correct data report to suit the business's need.

Most systems can produce quantitative data in the form of spreadsheets. Spreadsheets are what are commonly used to collate, order and present data for reports in most businesses. They can be used to perform calculations and produce tables and graphs for use in reports.

It is likely you will be sent data in Microsoft Excel spreadsheets from the accounts team. However, you may also be able to access and download the data from your business's information systems yourself.

You may require training and special permissions to access and download data from the information systems in your workplace.

What has happened on Day 1

On Day 1 of work at *Walk this way*, you have learned about:

- What is data
- Why data is collected
- The purpose of data collection
- Who uses data
- Data sources.

Learning checkpoint: Day 1

1. What is data? Tick the correct answer
   - ❑ A collection of information
   - ❑ Computer code
   - ❑ Design and Technology Association

2. Why is data collected? Tick correct answer.
   - ❑ To keep records for many reasons
   - ❑ To give someone something to do
   - ❑ Computers just do it

3. How is data collected? There are **two (2)** correct answers. Tick all the correct answers.
   - ❑ By information systems
   - ❑ By asking people questions and recording their answers
   - ❑ By sending emails
   - ❑ By holding a conference

4. What is data used for? There are **two (2)** correct answers. Tick all the correct answers.
   - ❑ To meet legal requirements
   - ❑ Creating social media posts
   - ❑ To show patterns and trends
   - ❑ To recruit new employees

5. Data has been used to produce a report on the cost of making different types of shoes. Who would be the audience of this report? Tick the correct answer.
   - ❑ Marketing manager
   - ❑ Production manager
   - ❑ Sales manager

Day 2

Lucy explains that your role will be to collect, order and collate data into a table or spreadsheet and produce graphs that will go into the sales and marketing report.

The data you will need is saved as a spreadsheet into a folder by the accounts team. It has a lot of information that you won't need for the report, so you will need to sort and collate only the data you need.

You will need to produce tables to show the:

- Product sales for the year so far (including units and values)
- Frequency and percentage frequency of orders of different quantities.

Lucy shows you last month's sales and marketing report.
This demonstrates what the tables and graphs should look like, but she only needs you to prepare them in a spreadsheet for now.

Choosing the process for the work task

Lucy asks you to collect, order and collate the data into a table or spreadsheet and produce graphs. To work out how best to solve this problem, write down the things you need to be able to produce from the task. These should include the following:

- What do I need the data to show?
- How do I obtain the current data and last year's data?
- What data do I need for each of the tables?
- Which of the tables also need graphs?
- How do I check that the tables and graphs I've produced are correct?

Ensure your list is in a logical order of steps on how you need to proceed.

What should the data show?

Lucy has provided an example of a previous sales and marketing report so you can see what data has been collated and how it has been presented.

However, remember that you need to think of how the data will be used and who will be using it. This will help you present the data. Some people may just want to see the data trends – for example, if the sales are going up or down. Others will need exact numbers to know how much stock will be required and how many staff will be needed to produce them.

Considering what the data should show will help you spot any errors or inconsistencies when you reflect on the results and outcomes.

How do I obtain the data?

Some businesses may require you to collect the data yourself from one or more of the information systems used in the business. However, Lucy has sent you the link to the data spreadsheets.

There is a graphing calculator app that you can use to plot data on a graph which can then be printed. Spreadsheet software is the most common way a business produces a graph or table form data.

After opening the data spreadsheet, it is best practice to save a copy and work from that. If you accidentally delete or change any of the data, you will have an original to refer to.

What data do you need?

A spreadsheet in Excel is called a workbook. A workbook may have several sheets that each have a tab at the bottom of the screen; this may be because the data in each tab is linked. Some data may also be presented differently in each tab to suit a particular purpose. If you are unsure, always check with your supervisor to confirm you are using the correct workbook.

The data in a sheet will be in columns and rows. Each column has a heading and you should look at the headings to see if they match the data types you need to report on.

The column headings in the worksheet titled 'Sales YTD' are:

- Customer ID
- Product ID
- Quantity
- Value
- Date

Note that YTD means Year to Date, so this sheet shows all the sales for this year thus far.

To create tables that show last month's product sales (units and value) and all product sales for the year so far (units and value), you will need data from all of the columns except the Customer ID column.

You may choose to copy the data you need to a new worksheet to ensure you are referring only to the relevant data. Otherwise, you can ignore the columns that you don't need.

Order and collate data into a table or graph

Often the data will need to be ordered, filtered and collated for the end user.

You will need to collate and order the data from Walk this way to show the product sales by unit and quantity both for the month and the year.

There are several ways you can order and collate data in Excel. You may have a method that you prefer, or you might want to watch an online tutorial.

One of the quickest ways to produce both tables and charts in Excel is to use a pivot table and chart. To do this:

1. Highlight your worksheet.

2. From the insert menu, click on Pivot Chart and choose Pivot Chart and Table from the dropdown menu.

3. You can then choose which table or range you want use (your data should already be selected) and where you want the table placed; Excel automatically adds it to a new sheet.

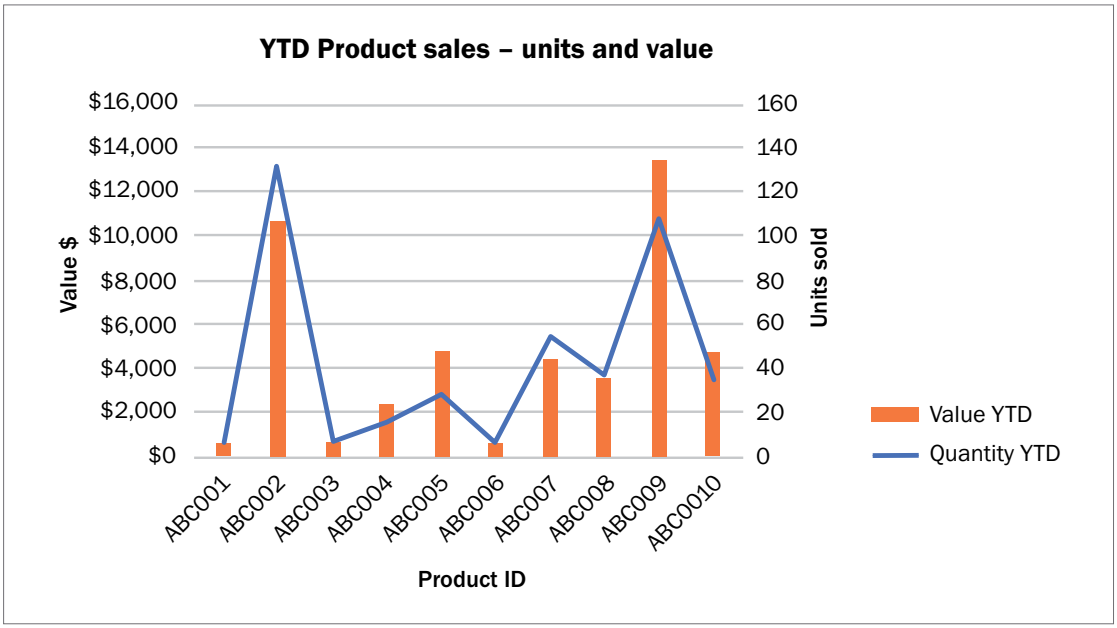
4. In the PivotChart fields box, click on the fields you want to see in your data. For the year's product sales report, you only need to choose product ID, quantity and value.

You will see that Excel automatically generates both a table and a graph. The table should look like this:

Row Labels	Quantity YTD	Value YTD
ABC001	6	$599.70
ABC002	132	$10,553.40
ABC003	5	$649.75
ABC004	14	$2,099.30
ABC005	24	$4,798.80
ABC006	5	$599.75
ABC007	54	$4,317.30
ABC008	38	$3,798.10
ABC009	104	$13,514.80
ABC010	34	$4,758.30
Grand Total	**416**	**$45,689.20**

You will notice that the chart generated doesn't do a great job of showing both value and quantity. If you right click on the chart and choose chart type, a chart menu will appear.

To show both quantity and value on the same graph, choose combo chart and then select the type of chart you want to use. Afterwards, select Sum of Quantity to be your secondary axis. You can then use the format chart area to change units to currency, edit the labels, scale and axes and change the colours. It might look something like this:



What information needs to be included in graphs?

When creating graphs, you need to ensure your graph has:

- A title
- Labelled axes (the example above has an X axis at the bottom, a Y axis on the left-hand side and a Z axis on the right-hand side)
- An appropriate scale for the data (the example above shows both value in dollars and units sold); the scale has to show the data without making it too big or small.
- Legend – this explains what the colours or lines on the graph represent.

Choosing the type of graph to use

There are various types of graphs you can use to present data, and some are more effective than others. The most common graphs are bar graphs, pie charts and line charts.

Bar graphs are effective for showing data that is independent of each other, for example sales revenue per month.

Pie charts show how a whole is divided into different parts; you could use a pie chart to show the sales quantity of different coloured shoes.

Line graphs show you how numbers have changed over time; they show data connections and trends.

Excel has a range of graph types to choose from, and the program will let you preview how they look so you can decide which type will work best for your data.

Lucy tells you to take some time to practice producing several different types of graphs and tables using the data from the spreadsheet.

Performing calculations in spreadsheets

The pivot table allows you to add up all the values in the data you have selected: this is known as the sum.

When you select a range of data in an Excel sheet, Excel automatically produces the average of the numbers and the sum of the numbers selected. This data is available at the bottom of the screen.

However, it is good to know how to perform simple calculations yourself using the software features.

Excel allows you to create formulas for a range of functions. These may take some time to learn, but you can write your own formula to carry out simple calculations.

Sum

You've already learnt that pivot tables add up the values. You also know that the selected values will be automatically summed at the bottom of the screen.

But to add up data in a spreadsheet, you can also use several other methods:

5. Highlight all the cells you want to add together down to an empty cell and then click to the Auto Sum button on the tool bar.

6. Type = in an empty cell, then select the first cell you want to add, type +, select the next cell and repeat this process as necessary. Press enter when you have finished, and the cells will be added together.

7. In an empty cell:
   - Type =SUM(
   - Select the range of cells you want to enter
   - Type)
   - It should look something like this: =SUM(A2:E2)
   - Press enter and you will have the sum of all the cells in that range.

Division

To work out the price per unit of the shoes sold this year, click in a cell that you want the answer to appear, and type:

- =
- Click on the first value cell (E2)
- Type a division symbol: /
- Click on the first quantity cell (D2)
- Press Enter and the price will be generated

Multiplication

Click on the cell you want the answer to appear and then:

- Type =
- Click on the cell that has the value you want to multiply
- Type *
- Click on the cell that has the next value you want to multiply
- Click enter
- You can also type in values if you prefer. For example, =E2*15

Frequency

The frequency of a data value is the number of times the data value occurs.

You have been asked look at the data for the year and report on how many times customers order products in the following quantities:

- 1
- 2–25
- 26–50
- 51–75
- 76–100
- 101+

There is a frequency formula in Excel that can help with this, but for small data amounts, it is easier to sort the quantity data from smallest to largest and then select the quantities that fall into each range.

Excel will automatically provide you with the count at the bottom of the screen, and you can enter it into your own frequency table.

To calculate the percentage frequency, you divide the frequency by the total number of orders which is 50 and multiply the answer by 100.

For example:

Quantity	Frequency	% Frequency
1	39	78
2–25	6	12
26–50	3	6
51–75	1	2
76–100	1	2
101+	0	0

Checking and reflecting on expected results

When you have completed your tables and graphs, you need to check them to see that they produced the results you expected. You need to make sure the results are clear and the data shows what the customer wants.

It is important to check that the results make sense and don't suggest a trend or pattern that is incorrect. For example, you might want to check the value of ABC002 so your colleagues don't waste time discussing trends or patterns that are incorrect. This would waste time, result in poor strategy decisions and hurt the business's profits.

Methods to check your results could include:

- Comparing them to the previous month, or the same time last year, to pick up anything unusual
- Choosing a data sample to ensure the formula you used is correct
- Checking the labels and legends on your graphs are correct.

Taking the time to check and reflect on your results will ensure you have carried out your job properly.

If you do find mistakes, reflect on how these happened and think about what you could do differently to avoid repeating them in the future. Some mistakes can happen if you entered the wrong data or used the wrong figures in the first place.

What has happened on Day 2

On Day 2 of work at Walk this way, you have learned about:

- Choosing the process for completing the work task
- Asking yourself what the data should show
- Obtaining data
- Deciding what data you need to complete the task
- Ordering and collating data into a table and graph
- Performing calculations in spreadsheets
- Checking and reflecting on expected results.

Learning checkpoint: Day 2

1. Which of the following do you need to think about when choosing a process for completing a task? There are **three (3)** correct answers. Tick the correct answers.
   - ❑ How long it will take to complete?
   - ❑ What do I need the data to show?
   - ❑ What data do I need for each of the tables?
   - ❑ How do I check my work is correct?

2. Why do you need to think about what the data should show? There are **two (2)** correct answers. Tick the correct answers.
   - ❑ So you make sure you have enough time to complete the task
   - ❑ To help you choose the right type of graph to use
   - ❑ To know which data needs to be included
   - ❑ To source the correct data

3. What tool will help you show the order of oldest to most recent? Tick correct answer.
   - ❑ A calculator
   - ❑ Pen and paper
   - ❑ Spreadsheet

4. It doesn't matter which graph type you choose, all graphs show the data clearly. Tick the correct answer.
   - ❑ True
   - ❑ False

5. Which symbol do you use to multiply two numbers in a spreadsheet? Tick the correct answer.
   - ❑ /
   - ❑ +
   - ❑ @
   - ❑ *

6. Which of the following can help you check that graphs and tables are correct? There are **two (2)** correct answers. Tick the correct answers.
   - ❑ Complete the task again using a calculator
   - ❑ Check them against previous data to see that they look right
   - ❑ Choose a data sample to check using another method
   - ❑ Rely on excel to tell you if the formulas don't work

Day 3

Lucy has checked your tables and graphs and is pleased with your work. She now asks you to place them into the sales and marketing report template so she can write some accompanying information that may be useful in interpreting the data.

Lucy has also asked that you write a brief explanation of how you generated the tables and graphs. She also suggests that you be prepared to answer any questions about them during the sales and marketing meeting.

Documenting and reporting your ideas

Tables and graphs are a mathematical representation of the data you have collected, ordered and collated.

Let's look at the first table and think about what you could write that might summarise the main information this table provides.

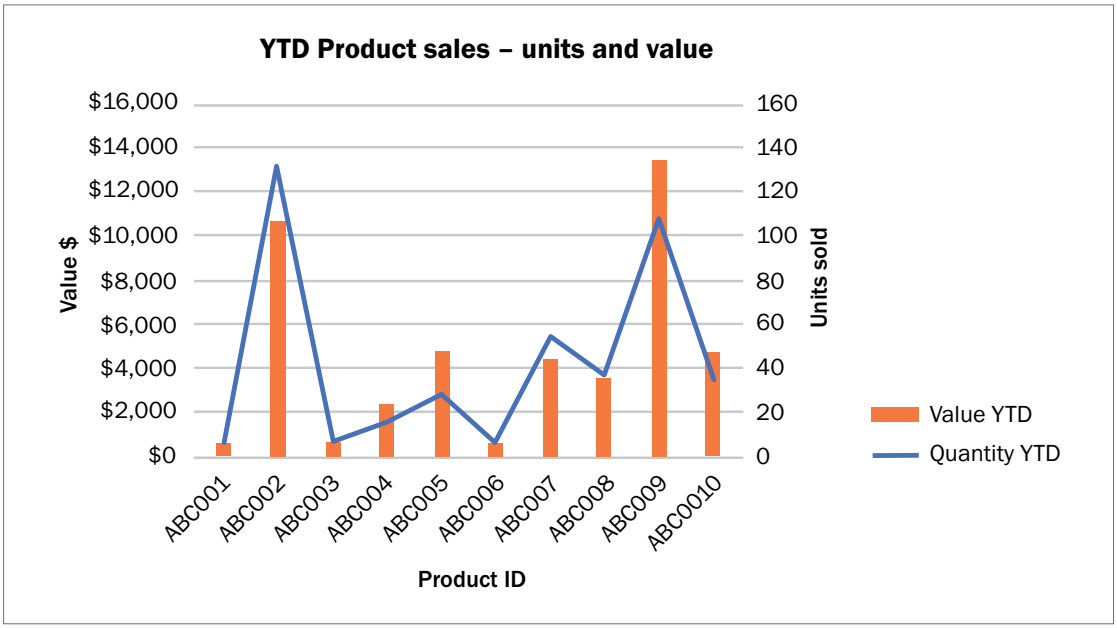
Row Labels	Quantity YTD	Value YTD
ABC001	6	$599.70
ABC002	132	$10,553.40
ABC003	5	$649.75
ABC004	14	$2,099.30
ABC005	24	$4,798.80
ABC006	5	$599.75
ABC007	54	$4,317.30
ABC008	38	$3,798.10
ABC009	104	$13,514.80
ABC010	34	$4,758.30
Grand Total	**416**	**$45,689.20**

You could summarise the key information like this:

- Product ABC009 has made the most money so far this year: $13,514.80
- Product ABC002 has sold the most units so far this year: 132
- Products ABC001, ABC003 and ABC006 have all sold less than 10 units so far this year.

By summarising the information, you are interpreting the data and making it easier for the user to see the key material in the table.

Now let's look at the graph:



By collating the data into a combined graph, you can highlight where there are interesting patterns in the data.

For example, the senior management team might be interested to see that although they sold more of product ABC002, it did not make as much money as product ABC009, which sold less but generated more income.

Senior managers may look at information like this to decide on which shoes are more profitable, which shoes they should produce and where their marketing efforts should focus. Therefore, summarising this type of information under the graph will be helpful in the report.

In most workplaces, the audience will be your work colleagues. Therefore, your language needs to be clear, accurate and formal.

Presenting your ideas

Lucy has also asked you to write down the process you used to collate the data to ensure you are prepared to field any questions during the sales meeting.

Write down the steps you followed to collect, collate and order the data. Remember to use the right mathematical symbols to express how you calculated totals or prices.

The following chart could be useful in helping you remember what each symbol represents:

*	Multiply
/	Divide
+	Add
=	Equals
%	Percentage

Now think about the way you might explain how you carried out the task. It would be good to look back at the questions you asked yourself on Day 2 regarding the process for completing a work task. This will demonstrate your problem-solving abilities.

These questions included:

- What do I need the data to show?
- How do I obtain the current data and last year's data?
- What data do I need for each of the tables?
- Which of the tables also need graphs?
- How do I check that the tables and graphs I've produced are correct?

Have the answers to these questions ready, but also be prepared to answer questions about how you ordered and collated the data. Some prompts include:

- To select data just from this year, I…
- I calculated the total value of sales by…
- I calculated the total quantity of sales by…
- I chose to use that graph because…

It is important that, when discussing how your task was prepared, you use the correct mathematical language to refer to the tools you have used and the work you have carried out.

What has happened on Day 3

On day 3 of work at *Walk this way*, you have learned about:

- Documenting and reporting your ideas
- Presenting your ideas.

Learning checkpoint: Day 3

1. A table and a graph are an example of mathematical representation. Tick the correct answer.
   - ❑ True
   - ❑ False

2. Which mathematical symbol represents the word percentage? Tick the correct answer.
   - ❑ @
   - ❑ #
   - ❑ %

3. Interpreting data makes it easier for the user. Tick the correct answer.
   - ❑ True
   - ❑ False

What you have learned

Well done. While working at Walk this way, you have learned about:

- What is data
- Why data is collected
- The purpose of data collection
- Who uses data
- Data sources
- Choosing the process for completing the work task
- Asking yourself what the data should show
- Obtaining data
- Deciding what data you need to complete the task
- Ordering and collating data into a table and graph
- Performing calculations in spreadsheets
- Checking and reflecting on expected results.
- Documenting and reporting your ideas
- Presenting your ideas.

You are now ready for the Final Assessment.