

FSKNUM008

Use whole numbers and simple fractions, decimals and percentages for work

Release 1



Learner guide

FSKNUM008

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simple fractions, decimals
and percentages for work**

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Aspire Version 1.1



Updates by Jan Hagston

Jan is a specialist in youth and adult education who focuses on literacy, numeracy and applied learning. She has worked with secondary schools, TAFEs, adult community education providers, universities and in workplace programs. She has a Masters in Educational Studies, has produced research papers across the secondary and VET sectors and written articles for education research journals.

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FSKNUM008 Use whole numbers and simple fractions, decimals and percentages for work, Release 1

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Name:	
Contact number:	
Email:	
Start date:	

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Place of work	
Company name:	
Address:	
Postal address (if different):	
Workplace supervisor name:	
Phone number:	
Email:	

FSKNUM008

Use whole numbers and simple fractions, decimals and percentages for work

Trainer to complete:

Registered Training Organisation (RTO)	
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Before you begin

This learner guide is based on the unit of competency *FSKNUM008 Use whole numbers and simple fractions, decimals and percentages 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 learnt	At the end of the learner guide, there is a list of what you have learnt. 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



Your story

Today is your first day working at Henry's Hardware. Henry is your supervisor and the owner of the business. Henry's Hardware has a shop where customers come to buy items, and a warehouse where items are stored. The items in the shop and the warehouse are called stock.

The warehouse is where Henry keeps extra stock. There are many different types of stock, such as timber, paint, brushes, nails, wire and tools.

Sometimes Henry delivers stock to his customers. Customers are the people who buy things from Henry's Hardware. The store also offers a gardening and odd-job service to customers.

At Henry's Hardware you will:

- Accept stock when it is delivered
- Put stock away in the warehouse or on the shop shelves
- Order stock
- Serve customers in the shop

Watch this video to learn about your role at Henry's Hardware.



Your tasks

Henry explains your tasks. Tasks are things you need to do in your job.

Learn about your tasks below.



Serve customers

Help customers find items, and use the cash register when customers pay for items.



Order stock

Use the catalogue to order items for the business or a customer.



Accept deliveries

Read the delivery docket and check that the right amount of stock has been delivered.



Put stock away

Put stock in the warehouse or on the shelves in the shop.



Day 1

On your first day working at Henry's Hardware, Henry shows you the warehouse and the shop where you will work. The warehouse stores large amounts of the items that are sold in the shop.

The warehouse is also where suppliers deliver stock . A supplier is a company that Henry orders stock from.

When you work in the warehouse, you will accept deliveries from the suppliers. When you accept the deliveries, you need to check that the amount of stock being delivered is what was ordered.

You will also work in the shop and serve customers.

Your job is to help customers find the items they want to buy, and use the cash register when customers pay for the items.

Using and reading numbers at work

You will need to use numbers at work. This may include reading numbers in documents, and using numbers when you do a task and talk to people.

For example, if you work in a clothing store, your task may be to hang clothes up so they are grouped together by size or the cost of the item. You will need to read numbers to organise the clothes in the right order.

At Henry's Hardware, you need to use numbers when:

- Serving a customer; for example, when a customer asks for four litres of paint or when a customer asks how much an item costs, such as a paintbrush
- Putting stock on the shelves according to size or quantity
- Reading a supplier's catalogue
- Ordering from a supplier
- Reading delivery dockets
- Filling out a time sheet



Example: Using and reading numbers at work

At Henry's Hardware, Henry uses a supplier's catalogue. If a customer wants to buy something that is not in the store, Henry finds the item in the supplier's catalogue and orders it for the customer. Henry explains that you will need to use the catalogue when the hardware store is running low on stock, or if customers need something ordered.

The information in a supplier's catalogue may include:

- The items they supply
- How much the items cost
- How much it will cost to have the items delivered



Example: An order form

This is an example of an order for paint and paintbrushes. The paint and paintbrushes are being ordered from Statewide Paints. The order form has different numbers. You need to read and understand the numbers so you can check the order before you send it to the supplier, Statewide Paints.

Statewide Paints					
506 Bay Street, Pearl Bay, NSW 8990 Telephone number: (02) 9035 5589					
Customer name: Henry's Hardware			Date: 17 February 2020		
Mailing address: 15 Short Street Small Town NSW 2997			Delivery address: 15 Short Street Small Town NSW 2997		
Telephone number: (02) 9001 2345					
Item code	Description	Size	Quantity	Unit price	Total
P889	Yellow paint	0.5L	50	\$ 12.50	\$625.00
P778	White paint	4 L	50	\$ 60.00	\$3000.00
P668	Green paint	0.5L	25	\$ 12.50	\$312.50
P278	Black paint	4 L	25	\$ 60.00	\$1500.00
B1470	Paintbrush	Large	100	\$ 16.00	\$1600.00
B790	Paintbrush	Medium	75	\$ 12.25	\$918.75
B5988	Paintbrush	Small	100	\$ 7.00	\$700.00
Comments: Free shipping on orders over \$750.00				Subtotal	\$8656.25
				10% GST	\$865.63
				Shipping cost	n/a
				Order total	\$9521.88
Payment details					
A deposit of $\frac{1}{4}$ of the total price is required before an order is placed.					
<input type="checkbox"/> Master card	Card number: □□□□□□□□□□□□□□□□				
<input type="checkbox"/> VISA	Month / Year				
	Expiry date: □□ / □□ □□ / □□				
	Cardholder: _____				
	Signature: _____				
	Card security code: □□□				

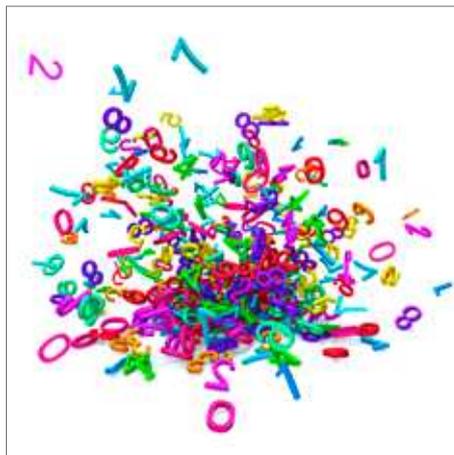
Numbers

There are different kinds of numbers that you will use in a workplace.

You may need to use:

- Whole numbers, such as 12, 50, 100
- Fractions like $\frac{1}{4}$, $12\frac{1}{2}$
- Decimals like 0.05, 12.25
- Percentages like 10%, 17.5%

Sometimes, numbers will be in dollars, such as \$15 or \$500,000. Sometimes, the numbers are written using numerals (such as 450, $\frac{3}{4}$, 5th, 0.05) or written as words (such as two, half, ten thousand).



Whole numbers

Whole numbers do not have any fraction or decimal points. Depending on where you work, you may need to read whole numbers to complete the task.

Here are some examples of situations where you may need to use whole numbers at work.



Shoe store

Organising the shoes according to size.



Hairdresser

Reading the numbers of colour toner and the amounts in instructions to mix hair dye for a customer.



Hardware store

Listen to a customer tell you the area they want to paint and work out how much paint they will need.

Writing and saying whole numbers

Whole numbers are written in digits or words.

Digits are 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. These ten digits make up all our numbers.

Numbers in digits	Numbers in words
305	Three-hundred and five
22	Twenty-two
9	Nine
6,374	Six-thousand, three-hundred and seventy-four

Example: Whole numbers

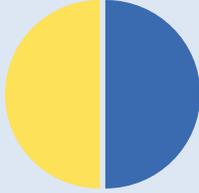
On the order form for paint, whole numbers are used a number of times. Some of the whole numbers are circled.

Statewide Paints					
506 Bay Street, Pearl Bay, NSW 8990 Telephone number: (02) 9035 5589					
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				10% GST	\$865.63
				Shipping cost	n/a
				Order total	\$9521.88
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A deposit of $\frac{1}{4}$ of the total price is required before an order is placed.					
<input type="checkbox"/> Master card	Card number: □□□□□□□□□□□□□□□□				
<input type="checkbox"/> VISA	Month / Year				
	Expiry date: □□ / □□ □□ / □□				
	Cardholder: _____				
	Signature: _____				
	Card security code: □□□				

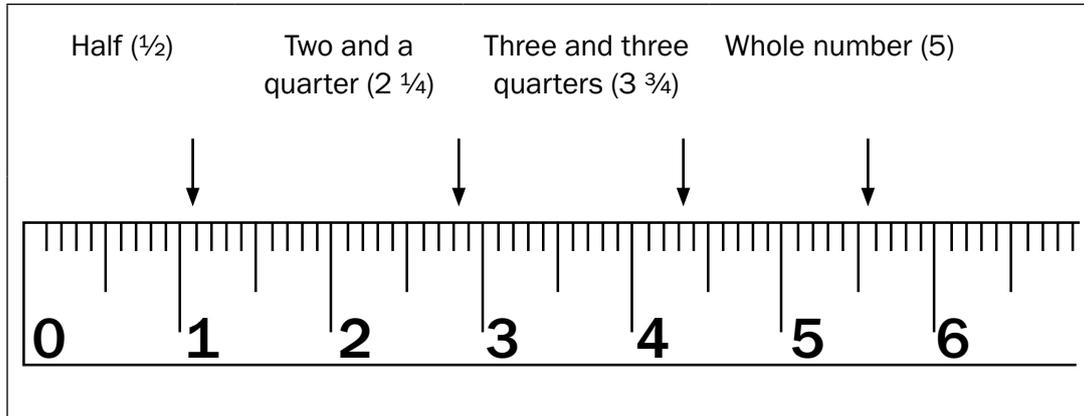
Fractions

When numbers are divided into parts, the parts are called fractions.

Here are some examples of fractions.

Fraction	What it is	What it looks like
$\frac{1}{2}$	Half	 <p>The light and dark parts are each half ($\frac{1}{2}$) of the whole.</p>
$\frac{1}{4}$	Quarter	 <p>The dark part is quarter ($\frac{1}{4}$) of the whole.</p>
$\frac{3}{4}$	Three quarters	 <p>The light part is three quarters ($\frac{3}{4}$) of the whole.</p>

Here is another way of representing whole numbers and fractions. This is from a ruler or tape measure. The lines between the whole numbers show the fractions, such as $\frac{1}{2}$.



Example: Using fractions at work

Here are some examples of situations where you may need to use fractions at work.



Café

Measuring ingredients to make a cake, e.g. $\frac{1}{2}$ cup of sugar



Deli

Weighing the food for a customer, e.g. $\frac{1}{2}$ a kilogram of ham.



Hardware

Calculating the cost of the deposit, e.g. $\frac{1}{4}$ of the total cost

Writing fractions

Fractions are written with one number over another number, for example: $\frac{3}{4}$

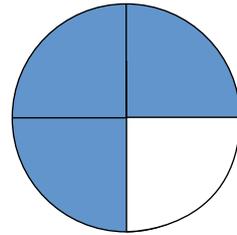
The bottom number of a fraction (called the denominator) tells you how many parts the whole has been broken or cut up into. The top number (the numerator) tells you how many of these parts you have.

$$\begin{array}{l} \text{numerator} \quad \longrightarrow \quad \mathbf{3} \\ \text{denominator} \quad \longrightarrow \quad \mathbf{4} \end{array}$$

This circle has been broken up into four equal parts.

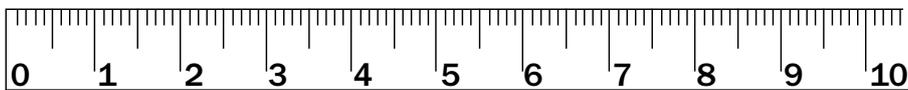
Each part shows $\frac{1}{4}$ (one quarter).

Three of the quarters are shaded, which equals $\frac{3}{4}$.



Each unit on this ruler has been broken up into 10 parts.

Each small unit shows $\frac{1}{10}$ (one tenth).

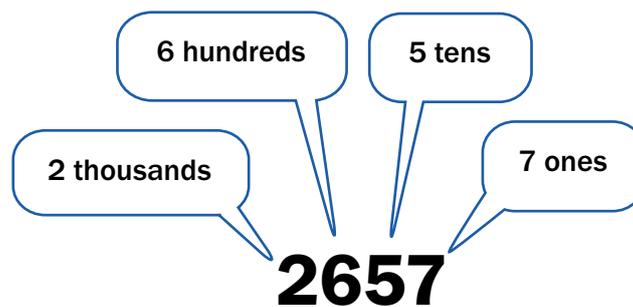


Place value

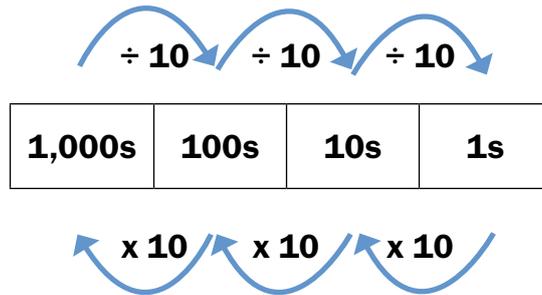
Our number system is a base ten or decimal system. This means it works by using 10 digits (0, 1, 2, 3, 4, 5, 6, 7, 8, 9).

Where the digit is positioned (its place) tells us what the number is. This is called place value.

The last digit (at the end on the right) in a whole number is worth one (sometimes we call it units). The next one across on its left is worth 10; the next one across is worth 10 times more (100); the next is 1,000, and so on. The digit in the number tells you how many ones, tens, hundreds and thousands in the number.



Each digit in a number is related to its next digit by being 10 times bigger or 10 times smaller. The place value goes up by 10 times as you go left ($\times 10$), or down by 10 times as you go to the right ($\div 10$).



For example, the number 2657 has four digits.

- The number 7 is in the place value of 'ones'. It is 7 ones, which equals 7.
- The number 5 is in the place value of 'tens'. It is 5 tens, which equals 50.
- The number 6 is in the place value of 'hundreds'. It is 6 hundreds, which equals 600.
- The number 2 is in the place value of 'thousands'. It is 2 thousands, which equals 2000. Even though 2 is a smaller number than 7, because of where it is positioned, it is worth a lot more.

Example: Place values in practice

Use the tables below to put the numbers under the correct place value.

Number	Place value			
	Thousands	Hundreds	Tens	Ones
365				

Number	Place value			
	Thousands	Hundreds	Tens	Ones
4409				

Number	Place value			
	Thousands	Hundreds	Tens	Ones
9999				

Number	Place value			
	Thousands	Hundreds	Tens	Ones
29				

Decimals

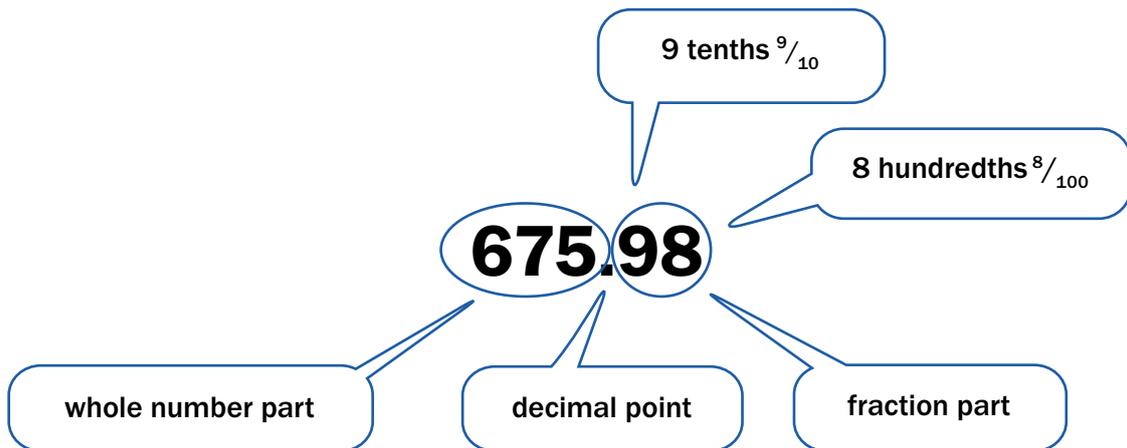
Decimals are made up of two parts: a whole number and a fraction.

Here are examples of decimals:

- 5.75 grams is how much something weighs
- \$12.95 is how much something costs
- 27.5°C is the temperature outside

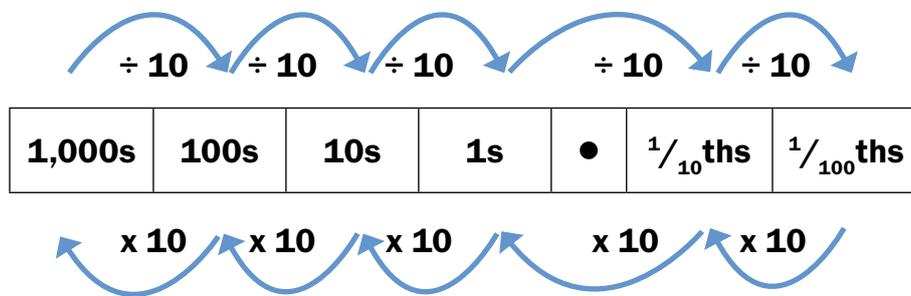
The numbers on the left side of the decimal point are whole numbers.

The numbers on the right side of the decimal point are fractions; for example, tenths and hundredths.



Just like with whole numbers, each digit in a decimal is related to its next digit by being 10 times bigger or 10 times smaller. The place value goes up by 10 times as you go left ($\times 10$) or down by 10 times as you go to the right ($\div 10$).

Divide by 10 when you go across into the decimal fractions from the left to the right. The first decimal place after the decimal point is therefore one divided by 10, which is tenths ($\frac{1}{10}$). The second decimal place is ten times smaller again, the hundredths ($\frac{1}{100}$).



Example: Using decimals

On the order form for paint, decimals are used for money and to show the size of some of the paint tins. Some of these are circled.

Statewide Paints					
506 Bay Street, Pearl Bay, NSW 8990 Telephone number: (02) 9035 5589					
Customer name: Henry's Hardware			Date: 17 February 2020		
Mailing address: 15 Short Street Small Town NSW 2997			Delivery address: 15 Short Street Small Town NSW 2997		
Telephone number: (02) 9001 2345					
Item code	Description	Size	Quantity	Unit price	Total
P889	Yellow paint	0.5L	50	\$ 12.50	\$625.00
P778	White paint	4 L	50	\$ 60.00	\$3000.00
P668	Green paint	0.5L	25	\$ 12.50	\$312.50
P278	Black paint	4 L	25	\$ 60.00	\$1500.00
B1470	Paintbrush	Large	100	\$ 16.00	\$1600.00
B790	Paintbrush	Medium	75	\$ 12.25	\$918.75
B5988	Paintbrush	Small	100	\$ 7.00	\$700.00
Comments: Free shipping on orders over \$750.00				Subtotal	\$8656.25
				10% GST	\$865.63
				Shipping cost	n/a
				Order total	\$9521.88
Payment details					
A deposit of $\frac{1}{4}$ of the total price is required before an order is placed.					
<input type="checkbox"/> Master card	Card number: □□□□□□□□□□□□□□□□				
<input type="checkbox"/> VISA	Month / Year				
	Expiry date: □□ / □□ □□ / □□				
	Cardholder: _____				
	Signature: _____				
	Card security code: □□□				

Example: Using decimals at work

Here are some examples of situations where you may need to use decimals at work.



Office or warehouse

Weighing a parcel to send to a customer, e.g. 0.375 kg



Daycare centre

Taking a child's temperature at a daycare centre, e.g. 38.2°C



Shop

Giving change to a customer when they buy an item, e.g. \$12.20

Zero as a placeholder

Sometimes there is a zero (0) in a number. Zero is used as a placeholder. This means that a zero is used to represent an empty column in a number.

The table below has examples of how the zero works as a placeholder.

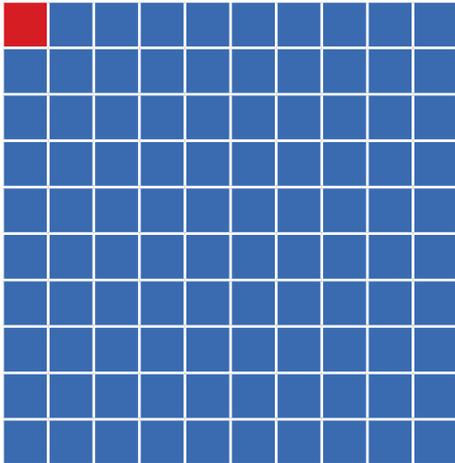
Number	What zero does	Value
305	<ul style="list-style-type: none">• It holds the place of 10.• This means there are no tens in the number.	<ul style="list-style-type: none">• Three-hundred and five
3,015	<ul style="list-style-type: none">• It holds the place of 100.• This means there are no hundreds in the number.	<ul style="list-style-type: none">• Three-thousand and fifteen.
35.05	<ul style="list-style-type: none">• It holds the place of a tenth.• This means there are no tenths in the number.	<ul style="list-style-type: none">• Thirty-five point zero five or <ul style="list-style-type: none">• Thirty-five and five hundredths

Percentages

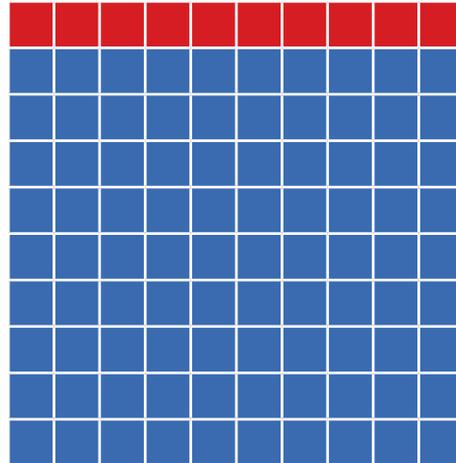
Percentages (or percent) are a way of showing a rate or amount out of 100. Percent means per hundred or out of one hundred. If the % symbol is after a number, it means that number is a part of 100. For example:

- 25% is 25 parts of 100
- 50% is 50 parts of 100
- 75% is 75 parts of 100
- 100% is all the parts of 100

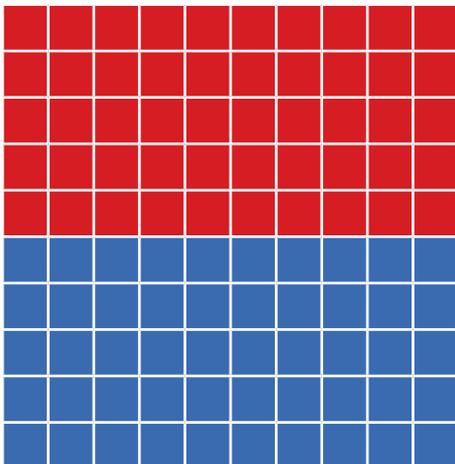
This is what 1% looks like.



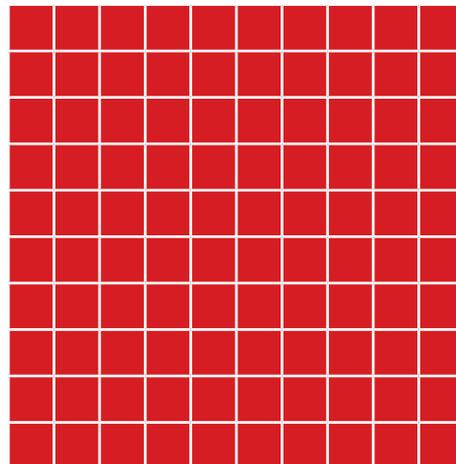
This is what 10% looks like.



This is what 50% looks like.



This is what 100% looks like.



Common percentages

The most common percentages are 10%, 25% and 50%.

These are the same as the following fractions:

$$10\% = \frac{10}{100} = \frac{1}{10}$$

$$25\% = \frac{25}{100} = \frac{1}{4}$$

$$50\% = \frac{50}{100} = \frac{1}{2}$$

When you make calculations with these percentages or fractions, it is the same as doing simple division.

$$10\% = \frac{1}{10} = \text{divide by 10}$$

$$25\% = \frac{1}{4} = \text{divide by 4}$$

$$50\% = \frac{1}{2} = \text{divide by 2}$$

For example, you have to work out a quote for pavers for a customer. The quote comes to \$150. You then have to add (tax) to the amount. The GST is 10%. To work out 10%, divide \$150 by 10. This equals \$15. You need to add \$15 for the GST to the cost of the pavers: \$150 + \$15. This equals \$165, so the cost of the pavers plus GST is \$165.

This is what the sums look like as calculations.

$$10/\$150.00 = \$15$$

$$\begin{array}{r} \$150.00 \\ + \$15.00 \\ \hline \$165.00 \end{array}$$

Example: Using percentages

On the order form for paint, the GST is shown as a percentage, 10%. The GST has been calculated by dividing the subtotal by 10%. This amount is then added to the subtotal to calculate the total cost of the order.

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<input type="checkbox"/> VISA	Month / Year				
	Expiry date: □□ / □□ □□ / □□				
	Cardholder: _____				
	Signature: _____				
	Card security code: □□□				

Example: Using percentages at work

Here are some examples of when you may need to use percentages at work.



Shop

Telling a customer how much an item is reduced by when there is a sale



Office

Writing a sales report showing the percentage of sales



Plumber

Working out the amount of GST that needs to be added to a customer's bill

What has happened on Day 1

On your first day of work at Henry's Hardware, you have learned about:

- Using numbers at work
- Whole numbers
- Fractions
- Place value
- Decimals
- Percentages

Learning checkpoint: Day 1

1. Which of these numbers are whole numbers? There are **two (2)** correct answers. Tick all the correct answers.

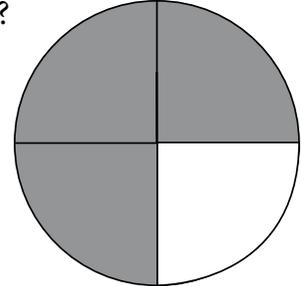
- 17
 3.9
 339.02
 71

2. How do you write 2,979 in words? Tick the correct answer.

- Two thousand nine hundred and nine
 Two nine seven nine
 Two hundred and ninety-seven
 Two thousand nine hundred and seventy-nine

3. Look at the image. What fraction is the white section? Tick the correct answer.

- $\frac{3}{4}$
 $\frac{1}{2}$
 $\frac{1}{4}$
 1



4. What is the smallest fraction? Tick the correct answer.

- $\frac{1}{4}$
 $\frac{3}{4}$
 $1\frac{1}{2}$

5. In the fraction $\frac{3}{10}$, which is the denominator? Tick the correct answer.

- 10
 13
 7
 3

6. Which place value is the biggest? Tick the correct answer.
- Tens
 - Thousands
 - Hundreds
 - Ones
7. Which of the following has a place value of 7 in the thousands (1000s)? Tick the correct answer.
- 8897
 - 1570
 - 8756
 - 7902
8. In the number 205, what is the 0 holding the place of? Tick the correct answer.
- Ones
 - Tens
 - Hundreds
 - Thousands
9. Which of the following includes a decimal? Tick the correct answer.
- 34
 - 3.49
 - $\frac{7}{10}$
 - 67%

10. What is thirty-seven point zero nine in digits?

Tick the correct answer.

37.0

37.00

37.09

37.90

11. You tell a customer they need 2.25 metres of wire. How would you say this number? Tick the correct answer.

Two and twenty-five metres

Two-hundred and twenty-five metres

Two point twenty-five metres

Two point two five metres

12. You ordered 100 large paintbrushes, but only 75 have been delivered. What percentage has been delivered?

Tick the correct answer.

25%

50%

75%

100%



Day 2

On your second day of working at Henry's Hardware, Henry talks to you about the calculations you may need to do at work. When a customer needs a product, they may not know how much of it they need, so they will bring in measurements. For example, Mrs Adams has just had a fence built and now wants to paint it. She brings in the measurements for how long and how tall her fence is. You may need to work out how much paint she needs based on these measurements.

Henry shows you where the calculator is, so you can use it to work out how much paint Mrs Adams needs for her job.

Henry explains that you will then use the cash register to work out how much the customer needs to pay. He also explains it is a good idea to estimate how much the customer will need to pay in case you enter the wrong amount into the cash register.

Solving a numerical problem

Depending on where you work and what your tasks are, you may need to solve a problem using numbers.

Here are some examples.

Problem	Solving the problem
<ul style="list-style-type: none">• How many sales has Henry's Hardware had in the last six months?	<ul style="list-style-type: none">• Add the number of sales for each of the last six months together.
<ul style="list-style-type: none">• A customer places a large order and gets a 10% discount on the total price.• How much should the customer pay for the order?	<ul style="list-style-type: none">• Add the price of each item together.• Divide the total by 10 to calculate the customer's discount.• Subtract the customer's discount from the total to find out what the customer should pay.

When you solve numerical problems like these, you need to be able to:

- Understand the problem and decide what you need to do, e.g. reading numbers and maths symbols and words
- Estimate the answer
- Do the maths
- Check your answer
- Write down and tell someone the answer

You may need to explain how you did the calculation.

Understanding mathematical language

You need to be able to read and understand maths symbols and language, such as on an order form.

To do the calculations and solve mathematical problems, you need to understand mathematical language. Mathematical language is made up of words and symbols. These describe calculations, such as addition, subtraction, multiplication and division.

When making calculations, different words may be used. These words may mean the same thing.

Here are some examples of different words that mean the same thing when describing calculations.

Calculation	Symbol	Words
Add	+	<ul style="list-style-type: none"> • Plus • Add • And • Sum • Total
Subtract	-	<ul style="list-style-type: none"> • Take away • Minus • Subtract • Take from • Difference • Less
Multiply	x	<ul style="list-style-type: none"> • Multiply by • Times • By • Lots of
Divide	÷	<ul style="list-style-type: none"> • Divide by • Into • Over

Calculations

To solve a numerical problem, you will need to decide what type of calculation to do.

Calculations are what you do to work out an answer to a mathematical problem. When you are doing calculations with numbers, you might have to:

- Add (+)
- Subtract (-)
- Multiply (x)
- Divide (\div)

These are called mathematical calculations or operations.

To solve problems using numbers, you need to understand and use the right operation.

Addition

Addition is the mathematical operation used to join two or more numbers or quantities together. Here is an example of addition:

9	+	30	= 39
			

$$9 + 30 = 39$$

Addition joins 9 and 30 together to make 39.

You can also say, 'The sum of 9 and 30 is 39.'

When you write an addition sum, it is important to set it out correctly. This will help you get the correct answer.

For example, if you have to add together 1.135 metres and 4.990 metres, you might set the addition sum out like this:

$$\begin{array}{r}
 1.135 \\
 + 4.990 \\
 \hline
 6.125
 \end{array}$$

Remember to line up the decimal points.

Subtraction

Subtraction is the mathematical operation used to take one number away from another, or to work out the difference between two numbers.

For example, a customer wants to buy a paintbrush that costs \$8. The customer gives you a \$20 note. To work out how much change you need to give the customer, you need to subtract \$8 from \$20:

$$\mathbf{\$20 - \$8 = \$12}$$

\$20 (The amount the customer gives you)	-	\$8 (The amount the customer owes)	=	\$12 (The change you need to give back to the customer)
				

Note: Subtraction is the opposite of addition.

For example, if $7 + 8 = 15$, then $15 - 8 = 7$.

When you write a subtraction sum, it is important to set it out correctly. This will help you get the correct answer.

For example, if you want to find out the difference between 7.84 and 5.65 metres, you might set the subtraction sum out like this:

$$\begin{array}{r} 7.84 \\ - 5.65 \\ \hline 2.19 \end{array}$$

Remember to line up the decimal points.

Multiplication

Multiplication is just a quick way of adding the same amount a number of times.

For example:

$$6 + 6 + 6 = 18$$

is the same as

$$3 \text{ lots of } 6 = 18$$

or

$$3 \times 6 = 18$$

3×6			=	18
				

When you write a multiplication sum, it is important to set it out correctly. This will help you get the correct answer.

For example, if you want to find out the total weight of 8 lots of 17 kg, you might set the multiplication sum out like this:

$$\begin{array}{r} 17 \text{ kg} \\ \times 8 \\ \hline 136 \text{ kg} \end{array}$$

Example: Using both multiplication and addition

Mr Jacobs wants to order:

- 5 × 10 litre tins of paint
- 10 × 1 litre tins of paint
- 5 medium paintbrushes
- 5 small paintbrushes

To work out how much Mr Jacobs needs to pay, you need to find the price of one of each item, and then multiply the cost of each item by how many Mr Jacobs wants to order.

The prices of the items in Henry's Hardware catalogue are:

- 1 10 litre tin of paint = \$150
- 1 1 litre tin of paint = \$17
- 1 medium paintbrush = \$12
- 1 small paintbrush = \$7

In the following table, the cost of each item is multiplied by the number (quantity) required of each item, to give a total. To find the grand total (total price of the order), the total for each item (in the right column) is added together to give \$1,015.

Item	Cost	Times	Quantity	Equals	Total
10 litre tin of paint	\$150	x	5	=	\$750
1 litre tin of paint	\$17	x	10	=	\$170
Medium paintbrush	\$12	x	5	=	\$60
Small paintbrush	\$7	x	5	=	\$35
Grand total					\$1,015

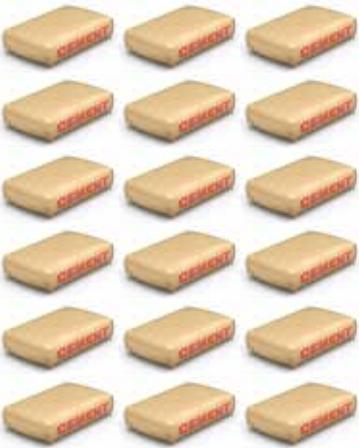
Division

Division means splitting or sharing an amount into a number of equal parts.

For example, if you need to work out how many lots of six you can divide 18 into, you can write this as:

$$18 \div 6 = 3$$

Here is what 18 divided by six looks like, or how many lots of six go into 18.

18	÷	6	= 3
			
			
			

Note: Division is the opposite of multiplication.
For example, if $7 \times 8 = 56$, then $56 \div 8 = 7$.

When you write a division sum, it is important to set it out correctly. This will help you get the correct answer.

For example, if you want to divide 12.55 metres into five equal parts, you might set out the division sum like this:

$$5 \div 12.55 = 2.51$$

Calculating your answers

People do calculations in different ways. You can:

- Use a pen and paper
- Work them out in your head
- Use a calculator

You can even do it all three ways if you like; this would make sure you get it right!

Using a pen and paper

For some calculations, you may need to use a pen and paper.

There are lots of different ways to calculate using a pen and paper. Do your calculations your way; whatever works best for you. Talk to your trainer or supervisor if you don't know how to do the calculations.

In the sections above about adding, subtracting, multiplying and dividing, there were some examples of calculating using pen and paper:

1.135	7.84	17	12.55
+4.990	-5.65	x 8	÷ 5
<hr style="border: 0.5px solid black;"/>			
6.125	2.19	136	2.51

Working out a sum in your head

Some calculations can be done in your head. This means you can do the calculation without writing it down.

Some people can do calculations quickly and easily in their heads, and they use lots of different ways and shortcuts to do this.

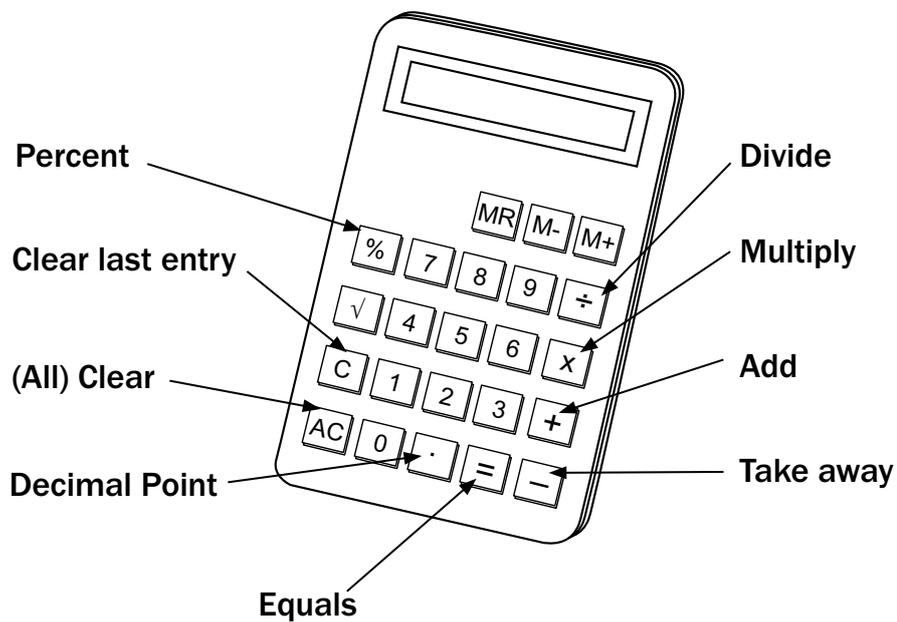
For example, if five bags of soil cost \$50, you can easily work out that 10 bags of soil will cost \$100. This is because you know that 10 bags is twice as much as five bags. You can work out the amount in your head because you know you need to double the cost.

Don't worry if you can't work out all sums in your head. Most people use either a calculator or pen and paper, or both.

Using a calculator

A calculator is a useful tool because it does calculations quickly and accurately. When using a calculator, make sure you know how to use one properly.

Below is a picture of a calculator showing the most common buttons.



The following table describes common symbols used on a calculator.

Operation	Button	Meaning
Add	+	Adds the next number to what you have already entered into the calculator.
Divide	÷ or /	Divides the next number into what you have already entered into the calculator.
Multiply	x or *	Multiplies the next number to what you have already entered into the calculator.
Take away	-	Takes away or subtracts the next number from what you have already entered into the calculator.
Percent	% or %±	Works out a percentage for you.
Clear last entry	C or CE	Clears from the screen just the last number you entered. This means that if you make a mistake when you enter a number, you can change it without deleting any previous numbers and operations.
(All) Clear	C or AC	Clears everything from the calculator.
Decimal point	.	The point that separates the whole number part of a number from the fraction part.
Equals	=	Pressing the = (equals) button gives you the answer to the calculation.

You should always check your answers.

When you are adding, subtracting, multiplying or dividing, some calculators do not know the correct order of operations. You may need to use brackets to show which part of the calculation should be done first.

Adding, subtracting, multiplying and dividing using a calculator

When you use a calculator, you need to press the buttons in the correct order to get the right answer.

For adding and multiplying, the order doesn't matter too much. For subtracting and dividing, you usually need to enter the highest number first. Otherwise you could end up with the wrong answer.

Below are some examples.

Adding

If you have to add together 1.135 metres and 4.990 metres, on a calculator you would press the buttons in the following order:

1	.	1	3	5	+	4	.	9	9	0	=
----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------

The answer should then show on the screen as:

6.125

The sum of 1.135 metres and 4.990 metres is 6.125 metres.

Subtracting

If you want to find the difference between 7.84 and 5.65 metres, on a calculator you would press the buttons in the following order:

7	.	8	4	-	5	.	6	5	=
----------	----------	----------	----------	----------	----------	----------	----------	----------	----------

The answer should then show on the screen as:

2.19

The difference between 7.84 and 5.65 metres is 2.19 metres.

Multiplying

If you want to find the total weight of 8 lots of 17 kg, using a calculator you would press the buttons in the following order:

8	x	1	7	=
----------	----------	----------	----------	----------

The answer should then show on the screen as:

136

The total weight of the 8 lots is 136 kg.

Dividing

If you want to divide 12.55 metres into five equal parts, using a calculator you would press the buttons in the following order:

1	2	.	5	5	÷	5	=
----------	----------	----------	----------	----------	----------	----------	----------

The answer should then show on the screen as:

2.51

12.55 metres divided by five is 2.51 metres.

Order of operations

When you are adding, subtracting, multiplying or dividing and the numbers are mixed up in a line of calculations or in a formula, you need to know what order to do the operations in.

The order for doing calculations with different operations is:

1. Do anything in **brackets** first
2. Do **division** and **multiplication** next
3. Do **addition** and **subtraction** last

This spells out the word 'BODMAS':

- **B**rackets
- **O**rders
- **D**ivision/**M**ultiplication
- **A**ddition and **S**ubtraction

For example, consider the sum

$$4 + 2 \times 5 = ?$$

If you add 4 and 2, then multiply by 5, you reach 30:

$$4 + 2 = 6$$

$$6 \times 5 = 30$$

However, this is incorrect because multiplication should be done before addition.

Instead, you should multiply 2 x 5, then add 4, to reach 14:

$$2 \times 5 = 10$$

$$10 + 4 = 14$$

If we translate this maths problem $(4 + 2 \times 5)$ into a sentence, it would be something like: 'How much is it if I buy a sandwich at \$4, and two hamburgers at \$5 each?' It makes logical sense to work out the multiplication first: 2 hamburgers at \$5 each to get \$10, then add \$4 to get the answer of \$14.

However, if the equation looked like this $(4 + 2) \times 5$, then the answer would be 30. This is because whatever is in brackets needs to be done first.

Estimating before a calculation

Before you do a calculation, think about what sort of answer you expect to get by doing a rough estimate.

An estimation is an approximation or educated guess. This is a guess based on knowledge and experience rather than just a number you think may be right.

Do a quick and rough calculation first to get an idea of what the answer could be.

Usually, you round off the numbers into easier, simpler numbers, so that you can add, subtract, multiply or divide them in your head or quickly with a pen and paper.

For example:



4 L Lemon paint: \$62.99 each



Small paint brushes: \$6.49 each

What is an estimate for how much it would cost to buy one 4 L tin of lemon paint at \$62.99 and one paintbrush at \$6.49?

Rounding off these two prices to the nearest \$10, the paint is a bit more than \$60, and the paintbrush is a bit less than \$10, so an estimate of the total cost would be \$60 + \$10, which equals \$70.

So, an estimate of the cost of buying these goods would be a bit under \$70. (Compare this with the exact answer of \$69.48.)

Doing the calculation

When doing calculations, you can use steps to find the answer. This means you do the calculation in parts.

For example, you want to work out how much money you will earn this week:

- You are paid \$20 for every hour you work
- You work eight hours a day
- You work four days a week

To calculate how much you will earn, use the following steps.

Step	Instruction	Answer
1	Work out how many hours you work in a week. Multiply the number of hours you work each day (8) by the number of days you work in a week (4).	8 (hours) × 4 (days) = 32 hours
2	Multiply the total hours you have worked by the amount of money you are paid for every hour.	32 (hours) × \$20 (per hour) = \$640
Total pay		\$640

Checking the answer

When you have finished a calculation, check that the answer is correct.

When you do your own calculations, you may make a mistake when you put the numbers into the calculator or when you write the numbers down.

You should always check your answers after you have worked them out. You can do three things to check your answers:

1. Check your answer against your initial estimate.
2. Think about whether your answer seems correct and reasonable. Use your prior knowledge, experience and common sense to think about whether the number seems right for the situation, or if it seems too high or too low. For example, if the amount of the tin of paint and the paintbrush came to \$6,948, you should realise that this is too much to pay for those items.
3. If you are unsure whether you have the correct answer to a calculation, ask your supervisor to check your work. It is always better to ask for help. If you don't, mistakes can be made that could cost you or the business a lot of money.



Communicating numerical information

In a workplace it is important to record and communicate the results of calculations clearly and correctly. To do this, use the mathematical language that is used in your workplace.

Depending on where you work, there may be specific words to communicate numerical information and results.



Formal and informal maths language

You may need to understand formal maths language to be able to read, write or talk about numbers and calculations (e.g., plus, difference, multiply, divide). Other times, you may be able to use informal language (e.g., total, from, lots of, into). You will also need to understand formal maths symbols (e.g., +, −, ×, ÷, %).

The formal maths words that you might need to learn about and use can depend on where you work. For example, if you work in a retail setting, you may record sales results in a report using formal language, such as ‘loss and gain’, instead of informal language, such as ‘the sales were up’ and ‘the sales were down’.

Formal maths language	Informal maths language
Last month the store had a loss of \$15,000.	Last month sales were down by \$15,000.
The expected gain for next month is \$25,000.	We expect sales to be up by \$25,000 next month.

You may also need to use words like ‘increase’ and ‘decrease’ if you are recording workplace information using percentages.

For example:

Formal maths language	Informal maths language
There was a 20% increase in sales.	Sales were up by 20%.
The 50% decrease in customers last month was due to the store being renovated.	Customers were down 50% last month because the store was being renovated.

You will often use formal maths language when you write, and informal maths language when you talk.

What has happened on Day 2

On your second day of work at Henry's Hardware, you have learned about:

- Solving numerical problems
- Understanding mathematical language
- Doing calculations
- Estimating
- Checking answers
- Communicating numerical information

Learning checkpoint: Day 2

1. What mathematical operations would you use to work out the total price of the order below? Tick the correct answer.

- Division and addition
- Multiplication and addition
- Subtraction and division
- Multiplication and division

Item code	Description	Size	Quantity	Unit price	Total
P889	Yellow paint	4 L	50	\$60.00	
P778	White paint	4 L	50	\$60.00	
P668	Green paint	4 L	25	\$60.00	
B5988	Paintbrush	Small	100	\$7.00	
Total					

2. Look at the order form above. Use a calculator to work out the total cost of the yellow paint. Tick the correct answer.

- \$240
- \$200
- \$300
- \$3000

3. Which symbol would you use to show the difference between the cost of two amounts of bark chips?

Tick the correct answer.

- +
-
- x
- ÷

-
4. Jamie wants to buy a packet of seeds and a bucket. The seeds cost \$3 and the bucket costs \$5. How much is the total cost? Tick the correct answer.
- \$2
 - \$5
 - \$8
 - \$15
5. Use a calculator to find the answer to five hundred and sixty-six dollars minus two hundred and thirty-nine dollars and forty-five cents. Tick the correct answer.
- \$36.55
 - \$326.55
 - \$6.55
 - \$39.45
6. If a customer gives you \$20 for an item that costs \$13, how much change should you give them? Tick the correct answer.
- \$33
 - \$17
 - \$7
 - No change
7. You are using weed matting in Mr Li's garden. The weed matting is 12 metres long. You need to cut it into 1.5 metre lengths to fit the garden beds. How many garden beds will the 12 metres cover? You should use a calculator to solve the problem. Tick the correct answer.
- 1.5
 - 6
 - 8
 - 12

8. What is another way of writing the following equation?
Tick the correct answer.

$$4 + 4 + 4 = 12$$

- $4 \times 3 = 12$
 - $4 \times 4 = 12$
 - $4 / 3 = 12$
 - $12 - 4 - 4 = 4$
9. What is the answer to $8 + 10 \div 2$? Tick the correct answer.
- 5
 - 9
 - 13
 - 20
10. After you have done a calculation, how should you check the answer? Tick the correct answer.
- Guessing
 - Using prior knowledge
 - Making up a number
 - Asking a friend
11. Henry tells you that there was a 45% increase in sales. Has Henry used informal or formal maths language?
Tick the correct answer.
- Formal
 - Informal

What you have learned

Well done. Since working at Henry's Hardware, you have learned about:

- Using numbers at work
- Whole numbers
- Fractions
- Place value
- Decimals
- Percentages
- Solving numerical problems
- Understanding mathematical language
- Doing calculations
- Estimating
- Checking answers
- Communicating numerical information

You are now ready for the final assessment.

