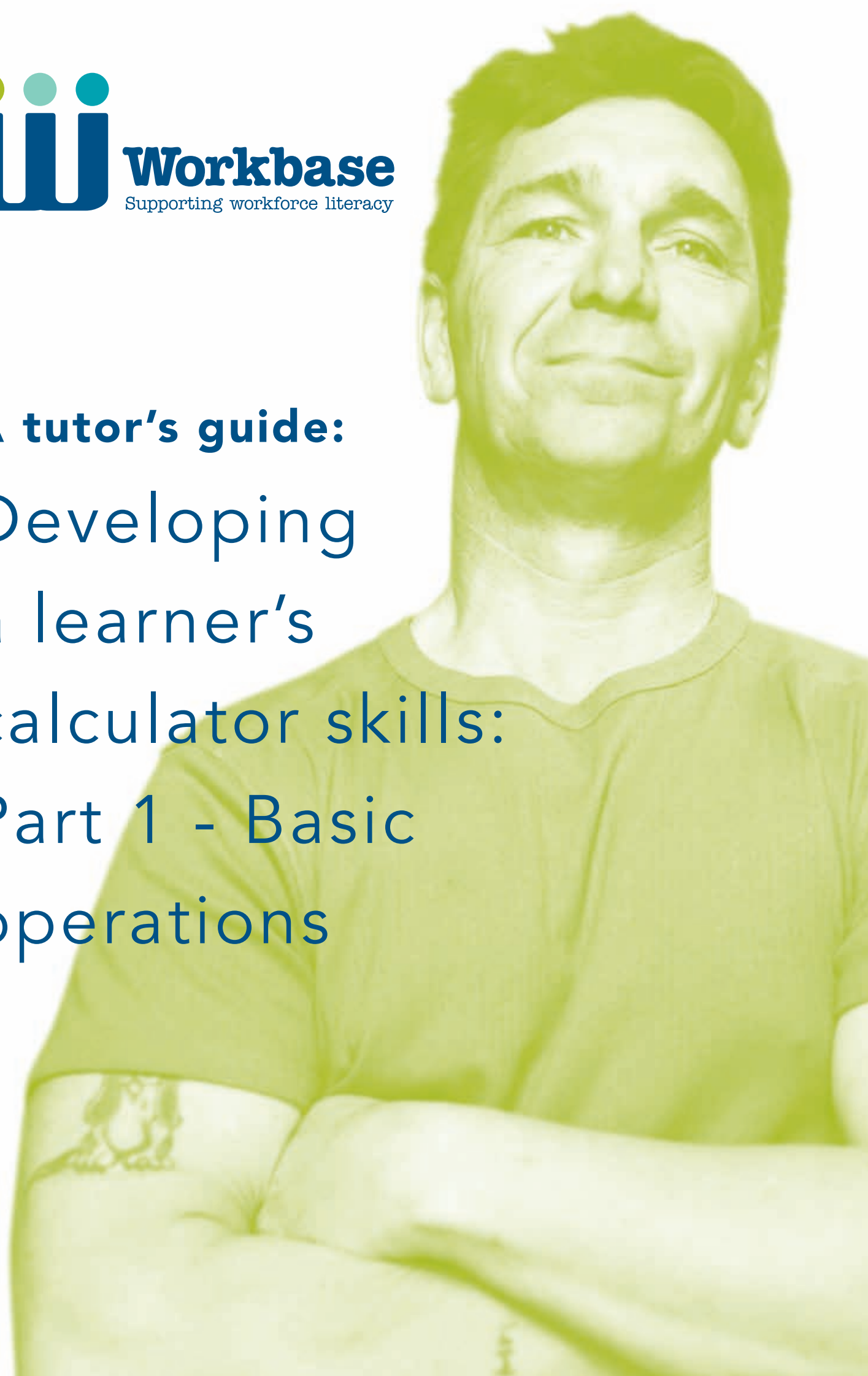


**A tutor's guide:**  
Developing  
a learner's  
calculator skills:  
Part 1 - Basic  
operations



# **A tutor's guide to developing a learner's calculator skills:**

## **Part 1 – Basic operations**

**Workbase: The New Zealand Centre for Workforce Literacy Development provides resources and professional development to support foundation learning for adults.**

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A tutor’s guide to developing a learner’s calculator skills:

Part 1 – Basic operations

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A tutor’s guide to developing a learner’s calculator skills:

Part 1 – Basic operations

How to use this guide

Purpose

The purpose of this guide is to develop a learner’s skills in using a calculator as one method of developing numeracy skills. It is intended that a learner will work through the guide with a tutor who can answer any questions the learner might have and offer guidance and support.

Structure

The guide contains a number of Learner Activities (identified in the top right-hand corner with the icon



Learner Activity).

For each Learner Activity there is a corresponding page that contains Teaching Tips for the tutor. Each of the Teaching Tips should be used to make sure your learner has the relevant language and concepts before they tackle the corresponding Learner Activity.

*A tutor’s guide to developing a learner’s calculator skills: Part 1 – Basic operations* covers:

- using a calculator
- estimating and rounding
- basic operations (+, -, x, ÷).

*A tutor’s guide to developing a learner’s calculator skills: Part 2 – More advanced operations* covers:

- a review of calculator use
- estimation and rounding
- percentages
- GST
- foreign exchange.

Materials and examples in Part 1 are set within a range of different contexts. Part 2 is set within a retail environment. Both guides provide a model that can be easily adapted to other contexts to suit the needs of learners.

These guides could also be used with peer tutors. However, you would need to structure the situation carefully in terms of expectations about how the learner and peer tutor would work together.

You would also need to monitor the situation carefully.

## A tutor's guide to developing a learner's calculator skills:

### Part 1 – Basic operations

#### Starting out

Your learner might have already been assessed and have some idea of where they need to develop their numeracy skills using a calculator.

Or your learner might want to go through both guides.

Each guide contains grouped activities relating to various topics that can be worked on separately, but it is best if they are worked on one after the other as later activities build on earlier ones. However, there is no need to work through all the activities if your learner shows they understand and can do the tasks. In these situations, move on to other areas where your learner does want to develop skills. It is quite common for people to be able to do some more complex tasks but not be as confident in areas you might think are more basic.

Some activities include references to additional online material that you can use with your learner. In some cases the additional material can be done online and in other cases you can print relevant worksheets and activities.

#### Additional reading and other resources

At the back of each guide there is a list of additional reading and where you might access other useful resources.

## A tutor's guide to developing a learner's calculator skills:

### Part 1 – Basic operations



Teaching tips

Learner activity 1



What is maths anxiety?

When you talk to people about maths, a lot of them (especially women) will say, “I am no good at maths” or, “I’ve never understood long division”. Researchers call this ‘maths anxiety’. It is used to describe the panic and feeling of helplessness some people feel when they have to solve a maths problem.

Symptoms of ‘maths anxiety’ include:

- mind going blank
- tension
- panic and sweating
- avoidance.

How can we overcome ‘maths anxiety’?

One of the most useful things people who feel like this can do, is to talk about their experiences with maths, whether at school, at home or at work. They need to realise they are not alone.

On the next page is a series of questions you and your learner can answer to find out how they feel about maths. Talk to them about what they have written then discuss with them the strategies for overcoming ‘maths anxiety’ on page 11.

How do you feel about maths?

1. Mathematics means \_\_\_\_\_  
\_\_\_\_\_
2. In maths classes at school I felt \_\_\_\_\_  
\_\_\_\_\_
3. My maths teachers were usually \_\_\_\_\_  
\_\_\_\_\_
4. What I liked most about maths classes was \_\_\_\_\_  
\_\_\_\_\_
5. What I disliked most about maths classes was \_\_\_\_\_  
\_\_\_\_\_
6. When I had problems in maths classes or didn’t understand something I \_\_\_\_\_  
\_\_\_\_\_

Learner activity 1 (continued)

7. To be good at maths you need to \_\_\_\_\_  
\_\_\_\_\_
8. My family felt that maths was \_\_\_\_\_  
\_\_\_\_\_
9. The maths skills I have a 'block' about are \_\_\_\_\_  
\_\_\_\_\_
10. I would like to learn more about \_\_\_\_\_  
\_\_\_\_\_

Adapted from '*Mathematics – a New Beginning*' edited by Beth Marr and Sue Helme, 1987, State Training Board of Victoria, Australia.

Learner activity 1 (continued)

Strategies for overcoming maths anxiety

If you feel anxious or embarrassed about your lack of maths skills, here are some strategies people with the same concerns have suggested for overcoming maths anxiety.

- Tackle maths rather than avoid it.
- Don't give up if you don't understand at first.
- It's okay to get the wrong answer.
- Maths isn't a race – take things slowly.
- If you are stuck, leave it and come back to it later.
- Ask someone who is supportive to help you.
- Don't always think you are wrong.
- Learn your tables a bit at a time.
- Learn the specific skills you need for your job – metrics, ratios etc.
- Ask for another explanation if you still don't understand.
- Share your feelings with someone else who feels the same way.
- Solve problems in a group.
- Make sure you understand how and why you got the answer.
- If you are working in a group, listen to other people's questions because they might be asking about something you don't understand as well.
- Work in a relaxed environment.
- Don't move on to something new until you have grasped what you are currently working on.

Adapted from '*Mathematics – a New Beginning*' edited by Beth Marr and Sue Helme, 1987, State Training Board of Victoria, Australia.

## Teaching tips

## Learner activity 2



### Maths in your day

Often your learner won't realise how often they use maths in their day. Talk to your learner about this. Talk about examples such as:

- setting the alarm to get up
- working out how long it will take them to get somewhere
- making a cup of tea
- having a shower
- filling their car with petrol
- budgeting their pay to last them all week
- savings
- paying things off e.g. lay-bys, hire purchases, loans
- cooking a meal
- shopping.

After your learner has filled in the next page (you can help them if you need to), talk about how often they use estimates and how often they need to be accurate. A lot of the time estimates are sufficient but there are some circumstances where accuracy is important. For example, if you are on an extremely tight budget it will be important to be accurate in relation to your spending.

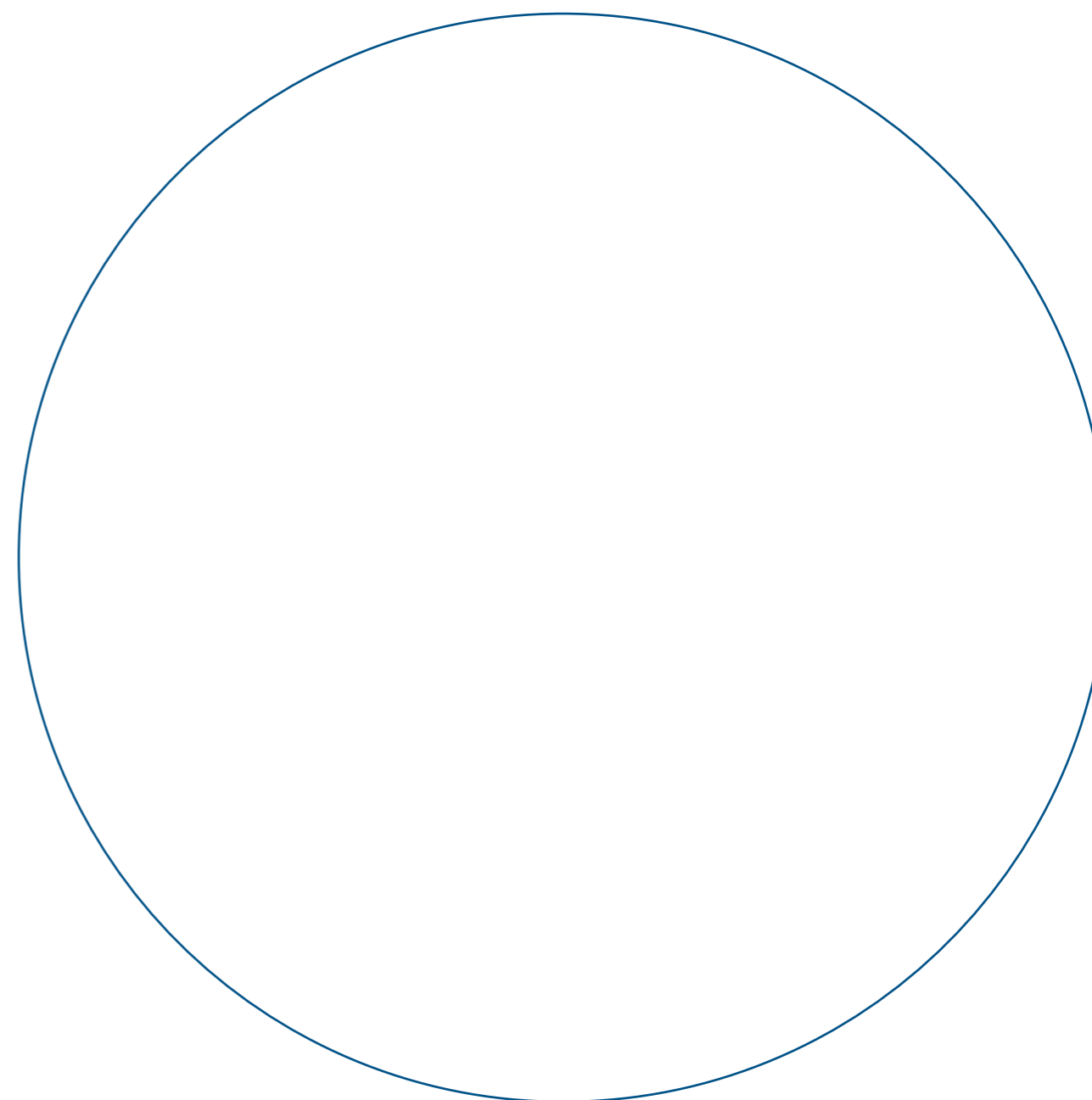
Also people's different personalities mean they approach maths differently. Some like to do everything accurately and others are happy with estimating. Others will use estimation most of the time but use accuracy when they really need to.

Then talk with your learner about specific activities they do at work or in learning contexts such as:

- tallying and counting
- measuring
- weighing
- giving change
- checking and adjusting temperature
- timing procedures e.g. processing time
- ordering supplies.

### Maths in my day

Talk to your tutor about all the ways you use maths in your day. Write them down.



## Teaching tips

## Learner activity 3



### Using calculators

Each calculator is a little different. Make sure your learner uses a simple one and not a scientific calculator. This guide uses one kind of calculator. However, the worked examples and the 'Fill in keys' tasks can be changed easily if your learner's calculator is different from the one used in this guide. In some 'Fill in keys' tasks, there might be free keys (that don't need to be filled in) depending on the method chosen.

Talk to your learner about how they feel about using a calculator.

Do they feel it is cheating?

Calculators are used everywhere, particularly in workplaces. They can range from simple hand-held calculators to calculators in computers and workplace machines.

The number of computer numerically controlled (CNC) machines in workplaces is increasing rapidly. Employees need to be confident that they can enter data into these displays. More importantly, they have to have the confidence to delete data they have entered incorrectly.

Teaching learners how to use calculators should be a part of every learning programme. This does not mean that we are teaching learners they do not have to use their brains. Instead, this guide sets out a process by which calculator skills and maths skills can be developed alongside each other.

Talk with your learner about the advantages and disadvantages of using a calculator. Discuss when you would work out an answer in your head, and when you would use a calculator.

Some examples when using a calculator is appropriate include:

- working with large numbers
- multi-step calculations
- when your answer must be accurate
- checking calculations you have worked out in your head.

Ask your learner if they can think of other examples that are relevant to their life.

### Talking about calculators

Why do we use a calculator?

People often think using calculators is cheating. They think that calculators stop us thinking for ourselves.

A calculator is only a tool that helps us to do sums easier and faster. But a calculator cannot do the thinking for us!

A calculator is a useful tool. You can use it to do difficult calculations quickly and accurately. You can check estimates and calculations you have done in your head.

Discuss with your tutor when you use a calculator at home, work or in your learning programme. Write down some examples.

---



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Look at the calculator on page 17.

Does your calculator look like that one? All calculators look slightly different, but most of them have the same basic functions.

If you have an instruction booklet for your calculator, take the time to read it. Ask your tutor if there is something you don't understand.

Teaching tips

Learner activity 4



Calculator keys

Your learner needs to understand what the calculator keys are used for and how they are used.

Pay special attention to the two clearing keys,



These keys have different names and different functions.

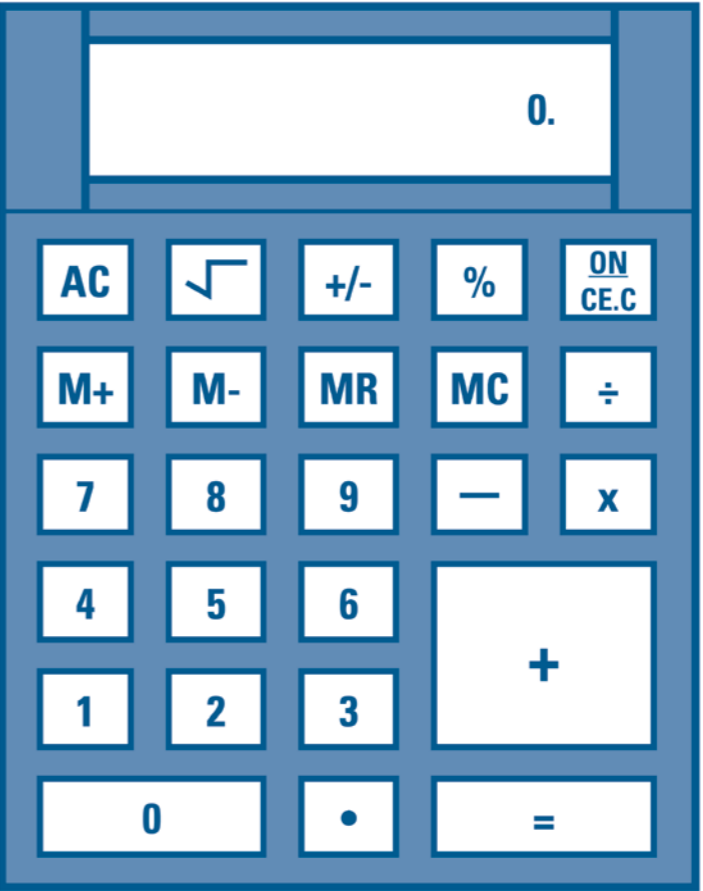
**ON CE.C** clears the last number you entered ('clear entry') and turns the calculator on.

**AC** clears all numbers entered ('all clear').

We will work with the clearing keys in more detail later on.

Looking at calculators

This is what a calculator can look like. However, every calculator is slightly different.



Keys



are called operation keys.



is the display (for the numbers you have entered and the answer when you finish).

## Learner activity 4 (continued)

## Learner activity 4 (continued)

**ON**  
**CE.C** and **AC** are clearing keys.

Do you know when to use them? When do you use **ON**  
**CE.C** ? \_\_\_\_\_

When do you use **AC** ? \_\_\_\_\_

On this calculator **ON**  
**CE.C** clears the last number you entered ('clear entry') and switches the calculator 'on'

**AC** clears all numbers entered ('all clear').

The Learner Activities in this guide will teach you how to use these operation keys in contexts relevant to you.

### More function keys

These keys are called advanced function keys.

**%** is the percentage key.

**+/-** changes between positive and negative numbers.

**MR** **M-** **M+** **MC** are memory keys.

These advanced keys are explained in another guide. In this guide we focus on the operation keys.

### Things to remember when using a calculator

- You switch the calculator on by pressing **ON**  
**CE.C**
- If you stop using a calculator for a few minutes, it might turn itself off. If this happens press

**ON**  
**CE.C** again.

- Take your calculator and press

**7** **3** **2**

Press **ON**  
**CE.C** to clear the display.

Teaching tips

Learner activity 5



Fill in the calculator keys

This Learner Activity might look too easy for your learner, but it is important that they are familiar with the keys as they will be used a lot in the other Learner Activities.

Make sure your learner understands what each key is used for. Talk about 'when' and 'why' they are used.

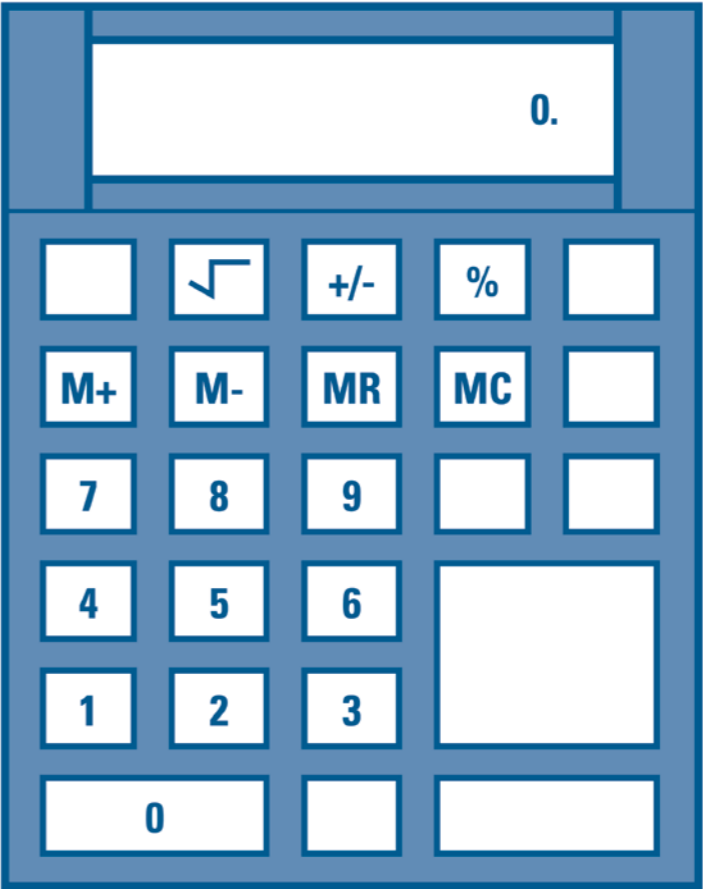
Then explain that later you are going to work with them to understand 'how' they are used.

If your learner struggles with this activity, look back at page 17.

Fill in the calculator keys

Look at this picture of a calculator. Some keys are missing. Write the keys below into the correct blank spaces on the calculator:

+	—	ON CE.C	x
÷	•	AC	=



Teaching tips

Learner activity 6



The display

Check that your learner understands why reading the display properly is important.

Talk about the different sorts of displays they might have come across.

They could include:

- mobile phones
- ATMs
- car parking machines
- EFTPOS machines
- scales
- microwaves
- ovens.

Discuss why numbers are displayed this way. Talk about where the ones, tens, hundreds and thousands are written.

Your learner may even pick up the fact that some displays have decimal points (.).

Working with calculators means your learner will have to improve their observation skills as it is essential that they read the calculator display carefully, in order to avoid mistakes.

Discuss with them what they can do to make sure they read displays correctly. Go over things such as taking care, taking their time and double checking if not sure. There may be other strategies you can think of as well that have worked for you or other people you know.

The display



Look at the display of your calculator. Make a list of all the machines you have come across that have displays like this.


When reading displays, you have to be really careful that you don't make any mistakes.

What things can you do to make sure that you read displays accurately?


Write down some other situations where you need to observe very closely.


## Teaching tips

### 'Writing' with the calculator

This activity involves making 'words' by putting numbers into the calculator and then turning it upside down to 'read' the words.

You can choose not to do this activity if you think your learner might think it is too childish.

This activity is designed so the learner can practise skills in finding various calculator keys in a way that is enjoyable.

At the end of this activity your learner will have gained confidence using the calculator and know where to find the keys they need.

## Learner activity 7



### 'Writing' with the calculator

1. Enter 0.7734 on your calculator.

Turn your calculator upside down.

What does the word say? \_\_\_\_\_

2. Enter the numbers below and turn the calculator upside down. You will find the missing word in each sentence.

637 The \_\_\_\_\_ of the machine is loose.

607 Please \_\_\_\_\_ your starting time.

771 When you are \_\_\_\_\_ you need to ring work.

710 You need to \_\_\_\_\_ the machines to keep them working.

7718 \_\_\_\_\_ works in the Delivery Department.

4614 For safety reasons you cannot wear \_\_\_\_\_

57334 \_\_\_\_\_ to work.

5508 Keep working. The \_\_\_\_\_ is coming!

7108 You need to \_\_\_\_\_ the milk before adding it to the mixture.

35007 The bolt is \_\_\_\_\_ on the machine.

3704 Put the flour in the large \_\_\_\_\_ at the top of the machine.

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Teaching tips

Learner activity 8



Maths words

Brainstorm with your learner all the words they know relating to addition, subtraction, multiplication, division as well as other maths words.

The brainstorm could look like this:

add plus	+	and together with	take away subtract	—	minus less than
multiply times lots of	x	groups of double twice as many	divide share out	÷	halve split
calculate	decimal maths words sum				figure

Other maths words could include:

- money – dollars, cents
  - patterns
  - shapes – square, round, cylinder, triangle, rectangle etc.
  - percentages
  - ratio
  - millions, thousands etc.
  - metric words – metres, kilograms, tonnes
- formula
  - diameter, radius, circumference
  - algebra, geometry
  - time – hours, minutes, seconds, days, months
  - speed – kilometres per hour
  - size – small, big, larger
  - fractions – half, quarter, third
  - measures – metre, kilogram, litre.

Maths words brainstorm

Write down in the boxes below all the words you know in relation to each sign e.g. plus, minus, multiply or divide. In the bottom box write down any other maths words you know.

<div>+</div>	<div>—</div>
<div>x</div>	<div>÷</div>
<div>other maths words</div>	

## Teaching tips

### Maths word list

This word list covers a number of relevant mathematical terms. The list is not comprehensive but includes common terms that are used in this guide and *A tutor's guide: Developing a learner's calculator skills: Part 2 – More advanced operations*.

Definitions of terms have been included as an example of what a glossary might look like. If there are other terms that your learner wants explained, do this on the blank sheet on page 77 of this guide.

Discuss with your learner frequently used mathematical terms. There may be some you know that they don't and vice versa. If you are not sure what a word means, look it up in a maths dictionary. These are available in most bookshops.

An online maths dictionary you might find useful is <http://www.math.com/school/glossary/glossindex.html>

## Learner activity 9



### Maths word list

This list covers some terms that are used quite frequently in maths.

Do you know their meanings?

Maths term	Meaning
Decimal	Decimals are part of a system of counting that is based on ten. 'Decimal' often means a number that includes a decimal fraction, such as 0.03 or 24.13.
Decimal place	The position of a number represents its value or decimal place. For example, in the number 3.915 the 3 = three ones or units, the 9 = $\frac{9}{10}$ , the 1 = $\frac{1}{100}$ and the 5 = $\frac{5}{1,000}$ .
Decimal point	A dot that is used to separate a whole number from a decimal fraction e.g. 2.75.
Decimal fraction	A fraction that is shown after a decimal point. For example, 0.9, 0.38 and 0.751 are all decimal fractions.
Digit	Any of the numerals from zero to nine. A digit is also called a figure. Numbers can be made up of one or many digits e.g. 238 is a three-digit number.
To estimate	To give a roughly correct but not exact answer.
Equals	The symbol for equals is =. It means 'the same as' or 'makes'.
Figure	Another word for digit.
Operations	Addition, subtraction, multiplication and division are number operations. Operations all make changes to a number using a set of rules.
Fraction	Part of something or part of a whole. Fractions can be shown as decimal fractions and percentages. The word fraction is often used for a number such as $\frac{3}{4}$ . The bottom number (denominator) shows how many parts make up the whole thing. The top number (numerator) shows how many parts you are working with.
Place value	Digits have different values depending on where they appear in a number. In the number 394, the 4 has the value of four ones (or units), the 9 has a value of nine tens and the 3 has a value of three hundreds.
Round	Rounding a number to the nearest ten means finding the tens number that is nearest to it. For example, 58 is rounded up to 60 and 53 is rounded down to 50.
Whole number	Any number that does not include a fraction – 7, 43, 281 and 3,415 are all whole numbers.

## Teaching tips

## Learner activity 10



### Basic operations

Now your learner has gained some confidence in using calculator keys you can start looking at the basic processes, the four operations



and the relevant keys on a calculator.

Your learner may have never used a calculator before, so take your time and make sure that there are plenty of examples to practise with. If you feel they are still having difficulty, make up some more examples. Keep your examples simple at this stage.

Long numbers can be very confusing. Make sure your learner understands that large numbers can look different on a calculator display e.g. 23,500 can look like this:



Note: the ',' is not a decimal point but separates the thousands.

Only progress to the next Learner Activity when your learner is confident and is getting all the number problems correct.

If your learner is already confident using a calculator, move on to the next Learner Activity.

### Additional material

See <http://www.bbc.co.uk/skillswise/numbers/wholenumbers/>

See Addition and Subtraction.

Only use relevant exercises at this stage e.g. use larger addition problems later in this guide.

Make sure your learner understands this is a UK website and could use £ and pence (rather than \$ and cents) and UK place names.

### Addition

Look at your calculator. Find the  $+$  key and the  $=$  key.

Enter these numbers into your calculator: 240  $+$  60  $=$  Write the answer in the display below.

		Display
Press	$2$ $4$ $0$	240.
Press	$+$	240.
Press	$6$ $0$	60.
Press	$=$	

Your answer is: \_\_\_\_\_

### Try these

- |  |  |   |
|--|--|---|
| 1. $8 + 4 =$ _____   | 2. $9 + 6 + 8 =$ _____   | 3. $31 + 58 =$ _____  |
| 4. $213 + 36 =$ _____  | 5. $291 + 473 =$ _____   | 6. $873 + 149 =$ _____  |
| 7. $\begin{array}{r} 9 \\ + 8 \\ + 5 \\ \hline \end{array}$      | 8. $\begin{array}{r} 39 \\ + 61 \\ \hline \end{array}$           | 9. $\begin{array}{r} 139 \\ + 218 \\ \hline \end{array}$          |
| 10. $\begin{array}{r} 59 \\ + 128 \\ + 73 \\ \hline \end{array}$ | 11. $\begin{array}{r} 81 \\ + 208 \\ + 73 \\ \hline \end{array}$ | 12. $\begin{array}{r} 532 \\ + 84 \\ + 113 \\ \hline \end{array}$ |

Teaching tips

Learner activity 11



Estimating

Estimating is a very important skill that your learner needs to develop when using a calculator. This skill helps them decide when they look at the answer on the calculator if the answer is correct. Your learner needs to understand that estimating is a skill they can learn. It is not about guessing but about making a rough calculation.

Estimating may be done on paper or mentally. Numbers are rounded up or down so it is easier to work with them quickly.

Discuss the first problem with your learner. See what strategies they have to work out how to estimate.

If they have a strategy that works for them, build on that strategy. If they don't have any strategies, teach them about rounding up (to 100) and rounding down (to 50) in relation to the first problem. Fifty and 100 are round numbers. They are manageable numbers and easy to use in calculations.

Spend a lot of time going through each problem and making sure your learner is confident in estimating. If your learner is unable to do maths mentally and is struggling using pen and paper, teach them to estimate using the calculator.

As you progress through the other Learner Activities in this part of the guide continue to get your learner to estimate.

Estimating skills will be developed further in other modules in this part of the guide.

Additional material

See <http://www.bbc.co.uk/skillswise/numbers/wholenumbers/whatarenumbers/rounding/>  
Only use the estimating exercises at this stage.  
Make sure your learner understands this is a UK website and could use £ and pence (rather than \$ and cents) and UK place names.

Estimating

Calculators cannot do the thinking for you. They are simply machines and you need to tell them what to do.

Sometimes when you are using a calculator you can press the wrong button and get the wrong answer. So it is always good to estimate what the answer will be **before** you start using the calculator. Estimating means you make a rough calculation. It doesn't mean you are guessing.

Estimating means if you press the wrong button you will know that the answer on the calculator is wrong and do the calculation again.

Try these

Check that you agree with our estimates in the Estimate column.

Now do each calculation using the calculator and write the actual sum in the second column.

		Estimate	Calculate
1.	$97 + 60 =$	160	<div><div>9</div><div>7</div><div>+</div><div>6</div><div>0</div><div>=</div><div>157</div></div>
2.	$345 + 50 =$	400	<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div>
3.	$50 + 75 + 35 =$	150	
4.	$40 + 70 =$	120	
5.	$339 + 599 =$	940	
6.	$296 + 150 =$	450	
7.	$1,319 + 197 =$	1,500	

## Teaching tips

## Learner activity 12



### Rounding up and down

This Learner Activity introduces your learner to rounding up and down using smaller numbers: five + ten.

Spend as much time on these problems as your learner needs.

Explain that there are different rounding methods and that it depends very much on the situation what rounding method is used and how accurate the rounding has to be. Explain that the general rule is:

- if numbers end in 1, 2, 3 or 4 you round down
- if numbers end in 5, 6, 7, 8 or 9 you round up
- if a number ends in 0 it stays the same.

Money is a good example of how estimation and rounding can be used.

It is easier to add up mentally when all prices are rounded up to the next dollar e.g. 67 cents to \$1.00.

However, businesses use different rounding methods. Some use the system set out above.

Some (especially supermarkets) use the Swedish rounding system, which is slightly different (if the price ends in 1 or 2 you round down to the previous \$1.00 or 10c; if it ends in 3, 4, 5, 6 or 7 you round to the nearest 5c; numbers ending in 8 or 9 you round up to the nearest 10c).

In other situations, if you are paying by cash a business may round a purchase of \$4.99 down to \$4.95. In other situations it may be rounded up to \$5.00. Your learner needs to be aware of these different methods.

Practise using real situations e.g. adding up goods purchased at a store or supermarket or work situations that are relevant and appropriate for your learner.

### Additional material

See <http://www.bbc.co.uk/skillswise/numbers/wholenumbers/whatarenumbers/rounding/>  
Make sure your learner understands this is a UK website and could use £ and pence (rather than \$ and cents) and UK place names.

### Round, estimate and calculate

Rounding makes estimating much easier. Remember that rounding a number to the nearest ten means finding the tens number that is closest to it.

There is a general rule:

- numbers that end in 1, 2, 3 or 4 are rounded down
- numbers that end in 5, 6, 7, 8 or 9 are rounded up
- if a number ends in 0 it stays the same.

For example:

- 53 is rounded down to 50
- 58 is rounded up to 60
- 55 is rounded up to 60
- 50 is not rounded as it is already a round number.

### Try these

- Round the numbers in these sums up or down to the nearest ten.
- Add the rounded numbers in your head to get an estimate.
- Does your estimate match the check estimate for each sum?
- Then work out the actual sum using your calculator.

1.	39	→	_____	2.	89	→	_____
	+ 22	→	_____		+ 56	→	_____
	+ 44	→	_____		+ 26	→	_____
	+ 39	→	_____		+ 74	→	_____
	Estimate		_____		+ 43	→	_____
	Check		140		Estimate		_____
	Actual total		_____		Check		290
					Actual total		_____

Learners activity 12 (continued)

3.	24	→	_____	4.	59	→	_____
	+ 14	→	_____		+ 65	→	_____
	+ 51	→	_____		+ 8	→	_____
	+ 31	→	_____		+ 64	→	_____
	+ 77	→	_____		+ 11	→	_____
Estimate			_____	Estimate			_____
Check			190	Check			210
Actual total			_____	Actual total			_____



Teaching tips

Learner activity 13



Addition with bigger numbers

These calculations are a little more difficult. If you need to write out more examples, make sure they are similar to the calculations in this Learner Activity.

It has taken quite a while to reach this stage but your learner now understands how to ‘Enter’ addition sums on the calculator.

Introduce the idea of adding and calculators in the learner’s life. Talk about when adding is used at home, at work or as part of a learning programme.

Discuss when your learner needs to use addition skills.

These discussions will prepare your learner for the next few activities and also help them to re-apply their skills to their work or learning environment.

With your learner go through the different addition words that you brainstormed earlier.

Check that they understand ‘add’ means the same as ‘plus’, ‘and’, ‘together with’, ‘more than’ etc.

Addition with bigger numbers

Try these

Work out the sum for each question. Remember to estimate first!

1.

$262 + 175 + 832 =$
2.

$621 + 675 + 823 =$
3.

$127 + 145 + 149 =$
4.

$123 + 254 + 396 =$
5.

$272 + 945 + 1,627 =$
6.

$621 + 4,763 + 228 =$

7.

$$\begin{array}{r} 386 \\ + 234 \\ + 920 \\ \hline \hline \end{array}$$
8.

$$\begin{array}{r} 204 \\ + 437 \\ + 1,191 \\ \hline \hline \end{array}$$
9.

$$\begin{array}{r} 913 \\ + 1,492 \\ + 1,273 \\ \hline \hline \end{array}$$
10.

$$\begin{array}{r} 127 \\ + 1,299 \\ + 3,467 \\ \hline \hline \end{array}$$
11.

$$\begin{array}{r} 6,000 \\ + 1,470 \\ + 891 \\ \hline \hline \end{array}$$
12.

$$\begin{array}{r} 12,473 \\ + 1,006 \\ + 904 \\ \hline \hline \end{array}$$

Did you add anything at work or somewhere else today? If you did, write down what it was.

Calculation \_\_\_\_\_

Why did you have to add these figures? \_\_\_\_\_

Put a circle around the strategy you used when you added.

Estimated in my head	Worked it out in my head	Used a calculator	Used pen and paper
----------------------	--------------------------	-------------------	--------------------

## Teaching tips

### Addition word problems

Your learner now understands how to do addition on the calculator.

On the following page your learner can practise with some written problems.

Initially keep extra exercises in a simple format. Always try to get as many examples as possible from contexts that are relevant to your learner.

Remember, use forms from your learner's workplace and names of people your learner knows to make any exercises more real.

If your learner likes a challenge and has the skills, develop some more difficult problems. There is a sheet about writing more problems on page 76 of this guide.

Make sure your learner always reads the problems very carefully. Word problems are useful for developing reading comprehension skills as well as mathematical skills.

### Stages in solving word problems

Australian researchers identified that there are five stages learners go through when they are solving word problems.

1. Reading
2. Comprehension (understanding the question)
3. Transformation (choosing the right method for the problem)
4. Process skills (using the right skills to solve the problem)
5. Encoding (writing down the answer in the right manner e.g. showing workings out if needed).

Explain these stages to your learner.

## Teaching tips (continued)

If your learner has any difficulties with word problems, it is worthwhile asking them questions that match the five stages to work out where they are having difficulties.

1. Read the question to me (Reading)
2. What is the question asking you to do? (Comprehension)
3. Tell me the method you can use to find an answer to the problem (Transformation)
4. Show me how you worked out the answer (Process skills)
5. Now write down the answer showing how you worked it out (Encoding).

For more details on this method see: *A tutor's guide: Assisting learners solve written numeracy problems*. Workbase, New Zealand.

### Think about

Word problems have real answers that relate to a particular unit of measure e.g. kg. When the learner has calculated the answer to a word problem, make sure that they add the unit of measure. Remember – 'A word problem has a word answer'.



Addition word problems

Use your calculator to solve these problems:

Tina is on the packing line. Her supervisor has set her a target of packing 2,200 trays of muffins per week. She packs:

540	Monday
+ 480	Tuesday
+ 485	Wednesday
+ 470	Thursday
+ 520	Friday

Add up what Tina has packed. Did she make her target? \_\_\_\_\_

Is this more or less than her weekly target? \_\_\_\_\_

The next week she packs:

420	Monday
+ 455	Tuesday
+ 415	Wednesday
+ 460	Thursday
+ 430	Friday

Did she make her target that week? \_\_\_\_\_

Teaching tips

Learner activity 15



If your learner likes a challenge, try some really hard problems.

Hard problems are often found in the charts and tables used in workplaces or learning programmes.

In this example, you need to add up numbers across the chart and down the chart. The answer should be the same for both directions. This answer is written in the circle in the chart that is part of the next Learner Activity.

Sometimes you will need to simplify the charts from your learner’s workplace or learning programme. Keep them fairly simple to start with. Save the difficult ones for later.

Remember that forms from the workplace or learning programme and names of people your learner knows make learning more real.

**Addition problems 2**

Tim works in Stores and he has decided to do a ‘stocktake’ of boxes of parts. There are three places where boxes are kept in his workplace. They are found in Stores, on the Packing Floor and in the Delivery Bay.

Help Tim by adding up the boxes.

Total the number of boxes of each product and the number of boxes in each place to get an overall total, which is written in the circle in the bottom right-hand column. The number of boxes of different types of product should be the same as the number of boxes in Stores, Packing Floor and Delivery Bay.

Product	Stores	Packing Floor	Delivery Bay	Total
	Number of boxes	Number of boxes	Number of boxes	Number of boxes
Drawing pins	3	2	10	
Nails	14	9	5	
Washers	27	11	5	
Nuts	5	9	20	
Tacks	18	7	16	
Metal hooks	49	92	153	
Plastic hooks	6	3	24	
Staples	31	14	37	
Bolts	9	6	11	
Screws	28	18	-	
	Total number of boxes in Stores	Total number of boxes on Packing Floor	Total number of boxes in Delivery Bay	Overall total number of boxes

Teaching tips

Learner activity 16



Decimals

The next three Learner Activities cover decimals and money. The list of maths terms on page 29 explains different terms that are related to decimals. Have a look at it again with your learner before they continue with the next Learner Activity.

If your learner has trouble understanding decimals, it may be better to put these activities to one side and try them later.

When you do try decimals, always cover '+' or addition first. It is the easiest process to understand.

Point out to your learner that when you write a dollar amount, such as \$2.45, there are only two places after the decimal point. This will change for weights, length and other decimal sums.

Also point out that where a number is written e.g. 17.00, it is not necessary to enter the .00 on the calculator.

The 'Fill in keys' exercises allow your learner to record the required key sequence on paper before keying it into the calculator. It is a very good way to consolidate skills.

If your learner already understands the steps in using a calculator, leave out the 'Fill in keys' exercises and work out the results straight away.

Again, you may need to write lots of examples for your learner to practise with.

Additional material

See <http://www.bbc.co.uk/skillswise/numbers/fractiondecimalpercentage/>  
Only use the relevant exercises at this stage. Don't use larger decimal numbers (e.g. more than two places after the decimal point) unless you and your learner are confident.  
Make sure your learner understands this is a UK website and could use £ and pence (rather than \$ and cents) and UK place names.

Decimals

On the next page we are going to work with decimals.

































You use decimals all the time e.g. with money \$8.75.

Adding decimals is the same as adding money.

Remember the decimal point  and put it in the right place e.g. 2.50.

Find the decimal point key  on your calculator.

Fill in the keys using the boxes below, then enter these numbers into your calculator and check the display. Turn the display upside down and read the words.

5,508.618	Press								
3,704.618	Press								
5,338.618	Press								
77,345.663	Press								

Learner activity 16 (continued)

Try these

Remember to estimate.

1.     $7.23 + 3.25 =$  \_\_\_\_\_

3.     $1.256 + 0.25 =$  \_\_\_\_\_

5.     $11.25 + 6.755 =$  \_\_\_\_\_

2.     $31.25 + 7.35 =$  \_\_\_\_\_

4.     $33.25 + 66.42 =$  \_\_\_\_\_

6.     $113.627 + 18.65 =$  \_\_\_\_\_

7.    
$$\begin{array}{r} 123.60 \\ + 14.733 \\ \hline \end{array}$$

8.    
$$\begin{array}{r} 627.43 \\ + 127.45 \\ \hline \end{array}$$

9.    
$$\begin{array}{r} 6.27 \\ + 17.00 \\ \hline \end{array}$$

10.    
$$\begin{array}{r} 12.375 \\ 5.825 \\ + 3.008 \\ \hline \end{array}$$

11.    
$$\begin{array}{r} 12.72 \\ 3.652 \\ + 1.443 \\ \hline \end{array}$$

12.    
$$\begin{array}{r} 82.76 \\ 13.704 \\ + 12.70 \\ \hline \end{array}$$



Teaching tips

Learner activity 17



Money and decimals

In this Learner Activity your learner may find working across the page quite difficult.

$27.23 + 3.25 =$

If that is the case try the vertical examples first.

$$\begin{array}{r} 627.43 \\ + 127.45 \\ \hline \end{array}$$

It is important to talk to your learner about how to set out a decimal calculation.

Remember to talk about the following:

- Keep decimal points under each other.
- Money always has two figures after the decimal point e.g. \$1.60. This also applies to whole dollars e.g. \$233.00 but we often drop the two zeros (.00) in that situation.

Talk about how some calculators don't show the zeros, especially once you push the + button. Check out whether your learner's calculator is like this.

Before your learner starts the Learner Activity make sure they understand that kg, m and l stand for kilogram, metre and litre if they are not familiar with these abbreviations.

Money and decimals

Addition of money and decimals

Often we need to add up decimals or money at home or at work. This often happens when order forms need to be filled out, or when special orders need to be made up. We can use our calculator to make these sums easier and to check that our answers are correct.

Make sure you remember to use the  key when you enter decimal numbers.

Try these

- |                                |                                |
|--------------------------------|--------------------------------|
| 1.    \$3.08 + \$2.75 = _____  | 2.    \$5.17 + \$3.22 = _____  |
| 3.    \$3.25 + \$0.60 = _____  | 4.    \$10.00 + \$5.00 = _____ |
| 5.    \$18.95 + \$5.95 = _____ | 6.    \$0.72 + \$0.98 = _____  |
| 7.    \$20.06 + \$3.15 = _____ | 8.    \$7.27 + \$0.46 = _____  |

- |  |   |  |
|--|---|--|
| 9. $\begin{array}{r} \$1.45 \\ \$2.30 \\ + \$1.40 \\ \hline \end{array}$                             | 10. $\begin{array}{r} \$1.25 \\ \$1.50 \\ + \$0.60 \\ \hline \end{array}$                       | 11. $\begin{array}{r} \$2.72 \\ \$1.65 \\ + \$1.00 \\ \hline \end{array}$                      |
| 12. $\begin{array}{r} 2.25 \text{ kg} \\ 0.85 \text{ kg} \\ + 1.22 \text{ kg} \\ \hline \end{array}$ | 13. $\begin{array}{r} 7.5 \text{ m} \\ 3.5 \text{ m} \\ + 3.75 \text{ m} \\ \hline \end{array}$ | 14. $\begin{array}{r} 8 \text{ l} \\ 1.5 \text{ l} \\ + 3.655 \text{ l} \\ \hline \end{array}$ |

Teaching tips

Learner activity 18



Reading charts can be difficult. Your learner needs to understand all the information in them before attempting a maths problem.

You will need lots of these sorts of forms from your learner’s contexts and lots of small problems to solve.

The chart in the Learner Activity is taken from a commercial bakery. If this does not fit your learner’s context, make one up that is suitable.

The decimal point is used in two ways in this chart:

- For the price (\$1.62).
- For the weight (1.360 kg).

You will need to remind your learner that 1,000 g = 1 kg. For example, if you have 250 g it will be written as 0.250 kg.

This can be very confusing for learners and you must work through these problems before attempting more difficult activities like this.

Decimal problems

Use the chart below to answer the decimal problems:

Bread price list					
Code	Brand	Description	Weight	Price code	Price
544	Top Lot	Sandwich sliced	0.68 kg	C	\$1.62
545	Top Lot	Toast sliced	0.68 kg	C	\$1.62
548	Top Lot	Wholemeal sliced	0.68 kg	C	\$1.62
530	Crusty	Traditional Vienna sliced	0.68 kg	D	\$1.69
92	Crusty	Wholemeal sliced	0.90 kg	F	\$1.81
542	Top Lot	Egg loaf	0.45 kg	F	\$1.81
86	Crusty	Organic rye sliced	0.68 kg	F	\$1.81
93	Crusty	Wholemeal sliced	0.68 kg	F	\$1.81
444	Top Lot	Commercial white sliced	1.360 kg	M	\$2.80

1. How much would three Top Lot sandwich sliced loaves cost?

There are two ways to work out the answer

\$1.62

\$1.62

\$1.62

or

\$1.62

x 3

2. How much would three egg loaves cost? \_\_\_\_\_

3. How much would three egg loaves weigh? \_\_\_\_\_

The local rest home has ordered 44 Top Lot commercial white sliced loaves.

4. How much will they weigh? \_\_\_\_\_

5. How much will they cost? \_\_\_\_\_

Teaching tips

Learner activity 19



Subtraction or 'take away'

Make sure your learner takes their time with this Learner Activity. Keep practising until they understand and entering the numbers becomes second nature.


Later on, you could write out a sheet with both + and – calculations. Mix them up. Make sure your learner reads and enters the numbers accurately.

Remind your learner to estimate at the start of each calculation.








Additional material

See <http://www.bbc.co.uk/skillswise/numbers/wholenumbers/>  
See Addition and Subtraction.  
Only use relevant exercises at this stage e.g. use larger subtraction problems later in this guide.  
Make sure your learner understands this is a UK website and could use £ and pence (rather than \$ and cents) and UK place names.

Subtraction or 'take away'

Find the  key on your calculator.

Estimate then calculate the following: 730  85  Write your answer in the display below.

		Display
Press	  	<input type="text"/>
Press		<input type="text"/>
Press	 	<input type="text"/>
Press		<input type="text"/>

Try these

1. 8 – 5 =

3. 120 – 57 =

5. 350 – 72 =

7. 

25
– 7
– 6
<input type="text"/>
<input type="text"/>

10. 

1,455
– 620
– 420
<input type="text"/>
<input type="text"/>
2. 39 – 23 =

4. 227 – 90 =

6. 198 – 17 =

8. 

333
– 22
– 17
<input type="text"/>
<input type="text"/>

11. 

2,330
– 750
– 640
<input type="text"/>
<input type="text"/>
9. 

277
– 145
– 17
<input type="text"/>
<input type="text"/>

12. 

10,000
– 700
– 230
<input type="text"/>
<input type="text"/>

Teaching tips

Learner activity 20



Subtraction problems

Before introducing the problems in the next Learner Activity, make sure your learner can write out a calculation that involves subtraction. A general rule in subtraction is that we take the smaller number from the bigger number.

For example, a problem is written out as:

$$\begin{array}{r} 125.55 \\ - 77.23 \\ - \quad 42 \\ \hline 6.32 \end{array}$$

Ask the following questions:

- Where is the biggest number written?
- Are the ones, tens and hundreds and decimal points written under each other?
- Where is the – sign written?
- Where do you write the answer?

These questions will help your learner organise themselves. Later, as they become more confident, it won’t be necessary to write out the calculation.

Again do not pass on to the next stage until your learner is fully confident with what they are doing.

Subtraction problems

Here are some more problems for you to solve. Remember to include the units in your answer e.g. ten boxes, three hours.

1. Josie has 450 boxes. She packs 375. How many boxes does she have left to pack?  
\_\_\_\_\_
2. Jack needed to pack 720 cartons into the delivery van. He has already packed 630. How many more does he need to pack?  
\_\_\_\_\_
3. Maria worked 48.5 hours last week. She usually works a 40-hour week. How many hours’ overtime did she work?  
\_\_\_\_\_
4. Les has \$10.00 in his pocket. He spends \$4.95 on food at lunchtime. How much does he have left?  
\_\_\_\_\_
5. Mike needs to load 860 packs into the machine. He has loaded 775. How many more will he need to load?  
\_\_\_\_\_

Teaching tips

Learner activity 21



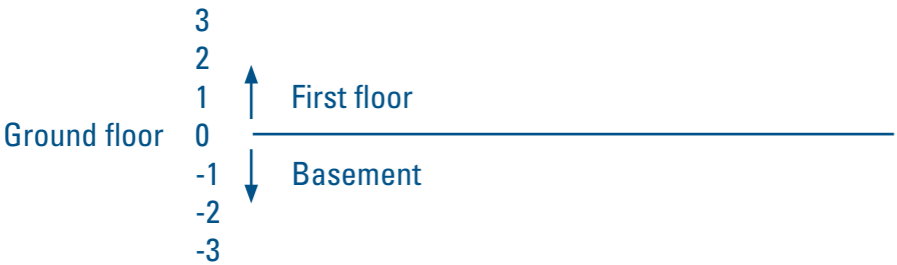
More subtraction

The next Learner Activity contains a problem that is a little more complex. Your learner should now be confident about subtracting one number from another. What about subtracting a series of numbers? Do they need to use the = button after every subtraction? What happens if they just use the – button?

Let your learner discover the answers for themselves.

In this example Kelly has enough money to pay the bills. What would happen if he had another bill of \$150.00 to pay? This Learner Activity introduces the idea of negative numbers. This is quite a common situation in workplaces and at home. Talk about this with your learner. Once they understand the idea of negative numbers, try a few more examples.

A helpful picture for explaining positive and negative numbers is the idea of a lift, with zero as the ground floor.



Another example is a freezer that operates at a temperature of at least  $-18^{\circ}\text{C}$ .

If your learner becomes confused, put these examples to one side and try them again later.

Additional material

If your learner wants to do some more work on negative numbers see <http://www.bbc.co.uk/skillswise/numbers/wholenumbers/> Scroll down and click on Negative Numbers. Make sure your learner understands this is a UK website and could use £ and pence (rather than \$ and cents) and UK place names. If you print the activities change the names for New Zealand places.

More subtraction problems

Can you solve this problem using your calculator?

Kelly gets paid \$400.00 each week. He has to pay some bills this week. Find out how much he has left over.

Enter	\$400.00
Subtract	\$53.20 for petrol
Subtract	\$85.00 for shoes
Subtract	\$100.00 for clothes
Subtract	\$22.50 for car payments
Subtract	\$12.80 for food

Will Kelly have any money left over? \_\_\_\_\_

If so, how much? \_\_\_\_\_

## Teaching tips

## Learner activity 22



## Multiplication

Your learner will probably complete this Learner Activity quite quickly. They already understand how to enter addition and subtraction sums. Multiplication will be a natural progression for them.

Here are some things you need to discuss with your learner:

- Talk about multiplication being a fast form of addition.
- Ask them when they would use addition and when they would use multiplication. (Multiplication is used when we work with the same number, e.g.  $7 + 7 + 7 = 7 \times 3$ . We must use addition if the numbers are different. We can only use multiplication if we are adding the same numbers together e.g.  $7 + 7 + 7$ .)
- Explain how to 'enter' a multiplication calculation.
- Practise with simple examples.
- Progress to more difficult examples.
- When the process is understood, move your learner on to problem solving.

Try to use examples that are real to your learner whenever possible. These could be from home, work or learning contexts.

Make sure to mix up your examples. Selecting which process they need is very important for your learner.

## Additional material

If your learner wants to practise their timestables see <http://www.bbc.co.uk/skillswise/numbers/wholenumbers> Click on Timestables. Also see the Timestables chart on page 78 of this guide.

## Multiplication exercises

If your learner wants to practise multiplication see <http://www.bbc.co.uk/skillswise/numbers/wholenumbers> Click on Multiplication. Only use appropriate exercises at this stage e.g. use larger multiplication problems later in this part of the guide. Make sure your learner understands this is a UK website and could use £ and pence (rather than \$ and cents) and UK place names.

## Multiplication

Look at the calculator. Find the **x** key.

Enter this sum: 3 **x** 4 **=** Write your answer in the display below.

		Display
Press	<b>3</b>	3.
Press	<b>x</b>	3.
Press	<b>4</b>	4.
Press	<b>=</b>	

## Try these

Remember to estimate.

1.  $19 \times 2 =$  \_\_\_\_\_
2.  $88 \times 3 =$  \_\_\_\_\_
3.  $57 \times 5 =$  \_\_\_\_\_
4.  $64 \times 6 =$  \_\_\_\_\_
5.  $99 \times 3 =$  \_\_\_\_\_
6.  $35 \times 9 =$  \_\_\_\_\_

Learner activity 22 (continued)

7.

83x 5

10.

181x 4

13.

316x 9

8.

69x 3

11.

136x 3

14.

433x 2

9.

11x 8

12.

210x 5

15.

384x 6



Teaching tips

Learner activity 23



Multiplication with bigger numbers

When practising with these multiplication examples, talk about the language of multiplication.

Multiplication is the same as:

- times
- groups of
- lots of.

We often ask people to:

- double
- triple
- quadruple
- give us twice as many.

This language can be very confusing for a learner, especially if English is not their first language. Ask them some questions from contexts that are real to them to see if they have trouble understanding these concepts. Now is the time to sort out these issues before you continue with more problems.

Multiplication with bigger numbers

Try these

Multiply the following numbers and write down the answers.

1.  $33 \times 17 =$  \_\_\_\_\_
2.  $1,200 \times 6 =$  \_\_\_\_\_
3.  $2,650 \times 5 =$  \_\_\_\_\_
4.  $544 \times 22 =$  \_\_\_\_\_
5.  $1,250 \times 8 =$  \_\_\_\_\_
6.  $273 \times 49 =$  \_\_\_\_\_

7. 
$$\begin{array}{r} 3,472 \\ \times 200 \\ \hline \hline \end{array}$$
8. 
$$\begin{array}{r} 5,200 \\ \times 230 \\ \hline \hline \end{array}$$
9. 
$$\begin{array}{r} 629 \\ \times 20 \\ \hline \hline \end{array}$$
10. 
$$\begin{array}{r} 900 \\ \times 40 \\ \hline \hline \end{array}$$
11. 
$$\begin{array}{r} 1,000 \\ \times 230 \\ \hline \hline \end{array}$$
12. 
$$\begin{array}{r} 680 \\ \times 20 \\ \hline \hline \end{array}$$

Look at these word problems. Write them out as number problems.

13. What is twice 450? \_\_\_\_\_
14. What is triple 1,500? \_\_\_\_\_
15. How long is three shifts of eight hours? \_\_\_\_\_

Teaching tips

Learner activity 24



Multiplication problems

By this stage you should have created a good basis for working with your learner on maths problems. You will be using lots of examples from their home, work or learning contexts, including perhaps charts, forms and procedures.

Ask them to bring maths problems to you. Go through the process for each problem, making sure you explain at each stage. Then make up activities for them to practise.

It is important at this stage to go back and check all the areas you have covered. Write out some simple problems as well as more difficult ones.

Checking in this way will enable you to evaluate how much your learner understands. It will also tell you what areas you need to revise.

Multiplication problems

Work out the answer for each problem. Write down your answers, including the units and your workings out.

1.

Biscuits are sold in packets of 20. How many biscuits would you need to fill 15 packets?
2.

Joe has 45 kg of plastic granules in his machine. How much would he have if he doubled the mixture?
3.

Hayley is saving for a car and has \$850.00 in her bank account. How much would she have if she trebled the amount?
4.

Anne works a 50-hour week. How many hours does she work in four weeks?
5.

Roger earns \$400.00 per week. How much will he earn in one year (if you are unsure how many weeks there are in a year, count them up on a calendar)?
6.

Mike packs five trolleys of product each day. There are 200 boxes on each trolley. How many boxes does he pack each day?

## Teaching tips

## Learner activity 25



### Division

You have now covered  $+$ ,  $-$  and  $\times$  on the calculator.

Now you are moving on to division.

Here are the steps you need to follow:

- Talk about division being a fast form of repeated subtraction in the same way that multiplication is a fast form of addition. If you want to find out how many threes there are in 18 you could keep subtracting three until you get to zero. The number of times you subtract will be your answer. A quicker way is to divide 18 by three.
- Explain how to 'Enter' a  $\div$  calculation.
- Practise with simple examples. You may want to point out different ways of writing division sums, such as  $12 \div 3 = 12/3$  or  $3 \overline{)12}$ .
- Progress to more difficult examples.
- When the process is understood, move your learner on to problem solving.

Your learner will be by now very familiar with entering different numbers. They won't take long to move on to the next Learner Activities – division sums with larger numbers and word problems.

Talk to your learner about what happens when division problems don't result in whole number answers. When your learner uses a calculator they need to know they will get a decimal answer e.g.  $22 \div 6 = 3.66666$ . Teach how to round to two or one decimal places or to a whole number.

If they are doing it mentally or on paper, they need to be able to say the answer is three remainder four.

### Additional material

See <http://www.bbc.co.uk/skillswise/numbers/wholenumbers/>

See Division.

Only use appropriate exercises at this stage e.g. use larger division problems later in this guide.

Make sure your learner understands this is a UK website and could use £ and pence (rather than \$ and cents) and UK place names.

### Division

Look at the calculator. Find the  $\div$  key.

Enter this sum:  $100 \div 5 =$  Write your answer in the display below.

		Display
Press	<b>1</b> <b>0</b> <b>0</b>	100.
Press	<b><math>\div</math></b>	100.
Press	<b>5</b>	5.
Press	<b>=</b>	

### Try these

Remember to estimate.

- |                          |                           |
|--------------------------|---------------------------|
| 1. $18 \div 3 =$ _____   | 2. $88 \div 8 =$ _____    |
| 3. $49 \div 7 =$ _____   | 4. $110 \div 10 =$ _____  |
| 5. $56 \div 8 =$ _____   | 6. $90 \div 5 =$ _____    |
| 7. $64 \div 8 =$ _____   | 8. $90 \div 3 =$ _____    |
| 9. $125 \div 25 =$ _____ | 10. $234 \div 18 =$ _____ |
| 11. $81 \div 9 =$ _____  | 12. $32 \div 8 =$ _____   |

Teaching tips

Learner activity 26



Division with bigger numbers

When practising with division problems, talk about the language of division again.

Division is the same as:

- sharing out
- grouping
- halving
- dividing.

Again ask your learner some questions from contexts real to them (work, home or learning) to see if they have trouble understanding the concepts and language related to division concepts.

Division with bigger numbers

Try these

Divide the following numbers and write down the answers.

- |                             |                              |
|-----------------------------|------------------------------|
| 1. $540 \div 2 =$ _____     | 2. $1,200 \div 6 =$ _____    |
| 3. $2,650 \div 5 =$ _____   | 4. $245 \div 5 =$ _____      |
| 5. $1,250 \div 10 =$ _____  | 6. $900 \div 90 =$ _____     |
| 7. $3,600 \div 40 =$ _____  | 8. $3,276 \div 39 =$ _____   |
| 9. $6,000 \div 10 =$ _____  | 10. $6,400 \div 800 =$ _____ |
| 11. $1,482 \div 38 =$ _____ | 12. $899 \div 29 =$ _____    |

Here are some other ways of talking about division:

13. What is half of 480? \_\_\_\_\_
14. What is a third of 90? \_\_\_\_\_
15. How many 12s in 168? \_\_\_\_\_

## Teaching tips

### Division word problems

These problems are similar to addition, subtraction and multiplication word problems on earlier pages.

These division word problems will help your learner to re-apply their maths skills in everyday life, including home, work and learning contexts.

## Learner activity 27



### Division word problems

Work out the answers to the following problems.

1. A full pallet contains 32 crates. How many pallets are needed for 256 crates?  
\_\_\_\_\_
2. Last weekend you went away with two friends and agreed to share the petrol costs of \$99.00. How much does each person have to pay if you share the costs equally?  
\_\_\_\_\_
3. Ken has bought 12 pieces of fish from the fish and chip shop. He shares the fish equally with three other friends. How many pieces does each of them get?  
\_\_\_\_\_
4. Sam wants to buy a motorbike costing \$672.00. He works out that he can save \$32.00 per week for a motorbike.
  - a. How many weeks will it take Sam to save for the motorbike?  
\_\_\_\_\_
  - b. How many weeks will it take if he can save \$56.00 each week?  
\_\_\_\_\_

Teaching tips

Learner activity 28



Mixed problems

In the previous Learner Activities, we have used lots of  $+$ ,  $-$ ,  $\times$ , and  $\div$  problems. Sometimes we need to use just one of these skills. Usually the learner needs to decide:

- what the problem is
- how they are going to solve it.

Then find the answer with their calculator.

This group of mixed problems shows you how to take one context and build lots of problems around it. If you do this with other examples from contexts that are real to your learner, it will make the learning more real and easier to apply.

A mixed bag of problems

Solve these problems using  $+$ ,  $-$ ,  $\times$  or  $\div$ .

1. There are 208 cartons in the warehouse. Another 22 cartons have come in. How many are there altogether?  
\_\_\_\_\_
2. If each of the cartons holds 100 packets, how many packets do you have altogether?  
\_\_\_\_\_
3. Customer A orders seven cartons. How many will you have left in the warehouse?  
\_\_\_\_\_
4. If each carton costs Customer A \$95.00, how much will they have to pay?  
\_\_\_\_\_
5. Customer B orders cartons worth \$760.00. How many cartons did they order?  
\_\_\_\_\_
6. There are 100 packets in each carton. How many packets did Customer B order?  
\_\_\_\_\_
7. Customer B puts all the packets they ordered out for sale. Three hundred and twenty-nine packets sell in one day. How many packets are left?  
\_\_\_\_\_

Writing more problems

More maths terms

Some of the Teaching Tips suggest writing more problems if your learner needs more practice.

How you do that will depend on what your learner needs to practise. If they need more practice at the same sort of problem so they can do it automatically, one approach is just to adjust the numbers in the original problem. For example, if the original problem is ‘27 boxes are on one shelf and 42 boxes are on the one below. How many boxes altogether?’, just adjust the number of boxes to make a new problem or write a problem that is more relevant to your learner’s context e.g. you sell 26 raffle books and then you see another 48. How many have you sold altogether?

Alternatively, follow these steps:

1. Analyse the problem in terms of operation i.e. is it addition, subtraction, multiplication, division etc?
2. Analyse the problem in terms of the size of the digits i.e. does it use single numbers or larger numbers?
3. Analyse the problem in terms of whether it is using money or not.
4. Analyse whether it is a single-step or multi-step problem.
5. Using the results of your analysis, write a new problem that is similar to the original problem.
6. Or create a more complex problem to give your learner more practice.
7. Talk to your learner about the problems they find the most difficult. Check different problems out with someone appropriate – their employer or supervisor if they are working, another tutor if they are in a learning programme or a member of their family or whanau.

Maths term	Meaning

Timestables chart

Additional reading and other useful resources

X	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36	42	48	54
7	7	14	21	28	35	42	49	56	63
8	8	16	24	32	40	48	56	64	72
9	9	18	27	36	45	54	63	72	81

Reading

'Number and Number Sense'

This US article from the Adult Numeracy Practitioners' Network analyses the skills and knowledge adults need for everyday life and emphasises the importance of estimation and mental maths.

<http://www.literacynet.org/ann/framework06.html>

'Making Peace in the Math Wars'

This article by Kathy Safford, published in the National Center for the Study of Adult Learning and Literacy's magazine *Focus on Basics* gives a personal account of a maths teacher's negotiation of the 'maths wars' by blending traditional and reform teaching approaches.

<http://www.ncsall.net/?id=77&pid=318>

'Let's End the Debate Over Calculators'

This article from the Centre for Mathematics and Science Education presents a useful synopsis of the arguments about using or not using calculators in maths classrooms. In the end the author argues that adults need to both understand the fundamentals of maths and use calculators.

<http://www.unc.edu/depts/cmse/MSEdNC/calculators.html>

'Calculators in the Classroom'

This 1998 article written about calculator use in US elementary schools looks at the stance of the National Council of Teachers of Mathematics, which maintains that each child should learn to solve problems using a calculator as well as mental and written calculations.

<http://www.sedl.org/scimath/quicktakes/qt9803.html>

Additional reading and other useful resources (continued)

Answer key

‘Using Calculators in Elementary School’

This opinion piece published in the US journal *Teaching Children Mathematics* supports the appropriate use of calculators.

See [http://my.nctm.org/eresources/view\\_media.asp?article\\_id=7149](http://my.nctm.org/eresources/view_media.asp?article_id=7149)

‘7 Basics for Teaching Arithmetic Today’

This article from the Scholastic website states that calculators are basic tools that have their place in children’s classrooms.

<http://teacher.scholastic.com/professional/teachstrat/arith.html>

Resources

You can borrow additional resources free from the Workbase library. Contact [info@workbase.org.nz](mailto:info@workbase.org.nz)

General numeracy resources are available on the New Zealand Literacy Portal, see <http://www.nzliteracyportal.org.nz/Numeracy/>

Page									
25	hello high	leg heels	log boss	ill boil	oil loose	Bill hole			
31	7								
	1. 12		2. 23		3. 89		4. 249		
	5. 764		6. 1,022		7. 22		8. 100		
	9. 357		10. 260		11. 362		12. 729		
33	1. 157		2. 395		3. 160		4. 110		
	5. 938		6. 446		7. 1,516				
35	1. 144		2. 288		3. 197		4. 207		
39	1. 1,269		2. 2,119		3. 421		4. 773		
	5. 2,844		6. 5,612		7. 1,540		8. 1,832		
	9. 3,678		10. 4,893		11. 8,361		12. 14,383		
43	2,495 trays 2,180 trays	Yes Tina made her target No Tina did not make her target					More		
45	Total - Number of boxes								
	Drawing pins 15	Nails 28	Washers 43	Nuts 34	Tacks 41				
	Metal hooks 294	Plastic hooks 33	Staples 82	Bolts 26	Screws 46				
	Total number of boxes in Stores 190      Total number of boxes on Packing Floor 171								
	Total number of boxes in Delivery Bay 281      Total number of boxes 642								
47	big boss	big hole	big bees	egg shell					
48	1. 10.48	2. 38.6	3. 1.506	4. 99.67					
	5. 18.005	6. 132.277	7. 138.333	8. 754.88					
	9. 23.27	10. 21.208	11. 17.815	12. 109.164					

Answer key (continued)

51	1.	\$5.83	2.	\$8.39	3.	\$3.85	4.	\$15.00
	5.	\$24.90	6.	\$1.70	7.	\$23.21	8.	\$7.73
	9.	\$5.15	10.	\$3.35	11.	\$5.37	12.	4.32 kg
	13.	14.75 m	14.	13.155 l				
53	1.	\$4.86	2.	\$5.43	3.	1,350 g or 1.35 kg	4.	59.84 kg
	5.	\$123.20						
55	645							
	1.	3	2.	16	3.	63	4.	137
	5.	278	6.	181	7.	12	8.	294
	9.	115	10.	415	11.	940	12.	9,070
57	1.	75 boxes	2.	90 cartons	3.	8.5 hrs	4.	\$5.05
	5.	85 packs						
59	Yes	\$126.50						
61	12							
	1.	38	2.	264	3.	285	4.	384
	5.	297	6.	315	7.	415	8.	207
	9.	88	10.	724	11.	408	12.	1,050
65	1.	561	2.	7,200	3.	13,250	4.	11,968
	5.	10,000	6.	13,377	7.	694,400	8.	1,196,000
	9.	12,580	10.	36,000	11.	230,000	12.	13,600
	13.	900	14.	4,500	15.	24 hrs		
67	1.	300 biscuits	2.	90 kg	3.	\$2,550.00	4.	200 hrs
	5.	\$20,800.00	6.	1,000 boxes				
69	20							
	1.	6	2.	11	3.	7	4.	11
	5.	7	6.	18	7.	8	8.	30
	9.	5	10.	13	11.	9	12.	4

Answer key (continued)

71	1.	270	2.	200	3.	530	4.	49
	5.	125	6.	10	7.	90	8.	84
	9.	600	10.	8	11.	39	12.	31
	13.	240	14.	30	15.	14		
73	1.	eight pallets	2.	\$33.00	3.	three pieces of fish	4a.	21 weeks
	4b.	12 weeks						
75	1.	230 cartons	2.	23,000 packets	3.	223 cartons	4.	\$665.00
	5.	eight cartons	6.	800 packets	7.	471 packets		



Calculators are everyday tools used in New Zealand workplaces. It is important that employees or those seeking employment have well developed calculator skills.

*A tutor's guide: Developing a learner's calculator skills: Part 1 - Basic operations* is written for tutors working with adult learners to develop their skills in using calculators.

*A tutor's guide: Developing a learner's calculator skills: Part 1 - Basic operations:*

- provides tutors with a practical resource for teaching basic calculator skills
- shows tutors how to introduce learners to the basic functions of the calculator
- contains strategies for use with learners so that they can solve addition, subtraction, multiplication and division problems
- includes Learner Activities and corresponding Teaching Tips in a range of contexts that can easily be adapted to other contexts to suit the needs of learners
- contains extension material and suggestions for its use as well as additional teaching material and resources.

*A tutor's guide: Developing a learner's calculator skills: Part 1 - Basic operations* is the companion to *A tutor's guide: Developing a learner's calculator skills: Part 2 - More advanced operations*.