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Maths

Entry Level 3, Book 3

GLH 3

Multiplication

Name	
Number	
Location	
Date Issued	

E3

Maths – Entry Level 3
Welcome to Book 3

Introduction

This booklet is part of your learning programme.

Remember to read carefully and try your best. Don't worry if you get stuck, make a note on the booklet and move on to the next task. Try coming back to it later, see if you can work it out then.

If you are still stuck, remember to make a note at the end of the booklet.

Throughout the booklet, you will see that some words have been printed **blue and bold**. You will find more detailed explanations of each of these words in the 'Glossary' at the back of the booklet.

Glossary is a list of often difficult or specialised words with their definitions, placed at the back of a book. You may also know this as a word bank.

By working through this booklet, you will become confident using different methods for multiplying numbers. Learning these skills will help you to work out your shopping, support you with tasks in the workplace and help you with many elements of your everyday life. How much would it cost to buy three magazines which cost £2 each? You would calculate 3 x £2, so £6.

Beyond memorising times tables, learning and understanding multiplication can help in other areas of maths including fractions, percentages and even shape.

What Do the Symbols in this Booklet Mean?

Where you see this symbol, there is a skills practice or activity for you to complete.

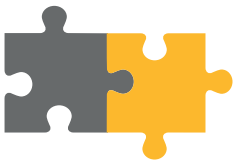
Information, explanations and case studies are shown with this icon.

This shows you there is a glossary or word bank with the meaning and correct spelling of key words.

This icon shows where to write comments for your tutor to read.

This symbol lets you know there are some key points to remember.

The Big Picture



You are studying Entry Level 3 Maths, which is taught over 55 Guided Learning Hours (GLH).

The programme covers the units listed below. The unit that you're working on today is ticked.

	Booklet	GLH	
1	Place Value and Sequencing		
2	Addition and Subtraction		
3	**Multiplication**	**3**	✓
4	Division		
5	Fractions		
6	Decimals and Money		
7	Rounding		
8	Time		
9	Shape and Space		
10	Measure		
11	Handling Data		
12	Recap and Summary		

Outcomes

These are the outcomes you can achieve by completing the learning activities in this booklet.

1. Multiply 2-digit whole numbers by single-digit whole numbers.

2. Multiply 2-digit whole numbers by 2-digit whole numbers.

Recap

A **recap** is an effective way of helping you to remember and apply what you have learnt. If this is your first booklet, it may help you to think about what you know already about this subject. Can you answer the following questions?

What was the last booklet you completed?

Can you remember what you learnt about?

Can you remember three key points from the booklet?

1

2

3

Recap

This page re-caps how to multiply single digit numbers by single digit numbers. It's useful to re-cap this as this will help with multiplying 2-digit numbers later in this booklet.

Multiplication table

This table can be used to help figure out the answers to multiplication questions.

To multiply 3 x 4, find the 4 column and the 3 row. Then find where the numbers meet, that is the answer. See the example on the table.

Columns run up and down the box and rows go from left to right.

The numbers highlighted in blue are **square numbers**. These are numbers that are made by multiplying the same number together.

Example:

2 x 2 = 4, 3 x 3 = 9, 4 x 4 = 16, 5 x 5 = 25

x	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

What is Multiplication?

Multiplication is the same as repeated addition, which means adding multiple copies of the same number.

Example:

5 x 2
which is the same as
2 x 5

This is the same as
5 + 5
(Two Fives)

It's also the same as
2 + 2 + 2 + 2 + 2
(Five Twos)

4 x 6
which is the same as
6 x 4

This is the same as
6 + 6 + 6 + 6
(Four Sixes)

It's also the same as
4 + 4 + 4 + 4 + 4 + 4
(Six Fours)

As you can see, you can do the sum either way:

5 lots of 2 or 2 lots of 5.

4 lots of 6 or 6 lots of 4.

Multiplication relies on your knowledge of times tables:

One two is 2.

Two twos are 4.

Three twos are 6, and so on.

Now Try These

You can use the multiplication table from page 9 to help you answer these questions.

(You can write the addition next to the question if that is helpful.)

Task 1

1. 8 x 4 =

4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 = 32

.....

2. 6 x 7 =

.....

.....

3. 9 x 5 =

.....

.....

4. 3 x 8 =

.....

.....

5. 7 x 9 =

.....

.....

6. 5 x 10 =

.....

.....

Multiply Two-Digit Whole Numbers by Single Numbers

There are a couple of ways to multiply – find what works for you.

Don't forget that place value is separating the numbers into tens and ones (units).

Example:

14 is made up of **1 lot of ten** and **4 ones**.

30 is made up of **3 lots of ten** and **0 ones**.

68 is made up of **6 lots of ten** and **8 ones**.

Grid Method

In this method, each digit in the number is split up into its place value column and placed in the correct position in the grid.

Example 1:

Calculate 5 x 6

- 5 is made up of 0 tens and 5 ones.
- This number is placed in the column down the left side of the grid, in the correct position.
- 6 is made up of 0 tens and 6 ones.
- This number is placed along the row at the top of the grid, in the correct position.
- We can then multiply the numbers together.
- The totals are added up for each row.
- We can now add up the last column to let us work out the final total.

	Tens (0)	**Ones (6)**	**Total**
Tens (0)	0 x 0 = **0**	0 x 6 = **o**	0 = **0**
Ones (5)	5 x 0 = **0**	5 x 6 = **30**	30 = **30**
Therefore, 5 x 6 = 30			**0 + 30 = 30**

Multiply Two-Digit Whole Numbers by Single Numbers

Example 2:

Calculate 15 x 6

- 15 is made up of 1 lot of ten and 5 ones.
- These numbers are placed in the column down the left side of the grid, in the correct position.
- 6 is made up of 0 tens and 6 ones.
- This number is placed along the row at the top of the grid, in the correct position.
- We can then multiply the numbers together.
- The totals are added up for each row.
- We can now add up the last column to let us work out the final total.

	Tens (0)	Ones (6)	Total
Tens (10)	10 x 0 = **0**	10 x 6 = **60**	60 = **60**
Ones (5)	5 x 0 = **0**	5 x 6 = **30**	30 = **30**
Therefore, 15 x 6 = 90			**60 + 30 = 90**

Column Method for Multiplying Numbers

Numbers can be multiplied together using the column method, which involves writing one number underneath the other.

Example 1:

What is 24 x 8?

Step 1: Write the information into the grid.

Step 2: Multiply the top right digit by the bottom number (4 x 8 = 32).

Step 3: Multiply the top left digit by the bottom number (2 x 8 = 16). This time we remember to make sure we put a 0 in the ones column to show we are using the tens column to work out the answer. This is the same as saying 20 x 8 = 160.

Step 4: Add our two answers together (start at the right) (32 + 160 = 192).

	Thousands	Hundreds	Tens	Ones
			2	4
x				8
			3	2
		1	6	0
		1	**9**	**2**

So, this means that **24 x 8 = 192**

Example 2:

What is 532 x 7?

Step 1: Write the information into the grid.

Step 2: Multiply the top right digit by the bottom number (2 x 7 = 14).

Step 3: Multiply the top middle digit by the bottom number (3 x 7 = 21). This time we remember to make sure we put a zero in the ones column.

Step 4: Multiply the top left digit by the bottom number (5 x 7 = 35). This time we remember to make put a zero in the tens column and in the ones column.

Step 5: Add your answers together (start at the right). (14 + 210 + 3,500 = 3,724)

	Thousands	Hundreds	Tens	Ones
		5	3	2
x				7
			1	4
		2	1	0
	3	5	0	0
	3	**7**	**2**	**4**

So, this means that **532 x 7 = 3,724**

Now Have a Go

Task 2

a.

			3	7
x				6

b.

			2	9
x				9

c.

			7	1
x				8

d.

			4	4
x				7

e.

			1	7
x				9

f.

			9	7
x				3

g.

			9	8
x				7

h.

		1	2	4
x				3

Notes

Notes

Let’s keep going

Feedback

WWW (What Went Well)

EBI (Even Better If)

Next steps

Learner feedback (Please provide some feedback for your tutor following the comments that you have just made on your work.)

Multiply 2-Digit Whole Numbers by 2-Digit Whole Numbers

Long Multiplication

Sometimes a multiplication question requires more than one step to get to the answer. This is when we use the long multiplication column method. It brings together all of the multiplication elements we've covered so far. We remember to add a zero to show we are using the tens column instead of leaving a gap at the end.

Step 1: Start by multiplying the top number (32) by the bottom right number in the ones column (2).

You can split this into:
2 x 2 = 4
30 x 2 = 60
This gives us the total of 64.

Step 2: Next, we need to multiply the top number (32) by the bottom number in the tens column (5). We need to put a 0 in the ones column because we are now working from the tens column and we can't leave an empty gap.

You can now split this into:
2 x 5 = 10
30 x 5 = 150
This gives us the total of 160.

	Thousands	Hundreds	Tens	Ones
			3	2
x			5	2
			6	4
	1	6	0	0
	1	**6**	**6**	**4**

Because there is already the 0 in the ones column, this gives us the total of 1,600. Finally, add your two answers together (start at the right).

The answer is **1664**.

Remember: You can also use the grid method to work out calculations. This example shows you how to work out the first multiplication problem in Task 3 (36 x 32).

	Tens (3)	**Ones (2)**	**Total**
Tens (3)	30 x 30 = **900**	30 x 2 = **60**	900 + 60 = **960**
Ones (6)	30 x 6 = **180**	6 x 2 = **12**	180 + 12 = **192**
36 x 32 = 1,152			**960 + 192 = 1,152**

Now Have a Go

Task 3

a.

			3	6
x			3	2
			7	2
	1	0	8	0
	1	1	5	2

b.

			4	6
x			3	3

c.

			1	6
x			3	2

d.

			1	4
x			2	3

e.

			2	5
x			3	6

f.

			3	5
x			5	6

g.

			3	4
x			2	3

h.

			4	3
x			3	3

Now Have a Go

Task 4

A customer in a supermarket wants to buy 42 packs of biscuits. Each pack has 35 biscuits (This is the same as saying 42 x 35). How many biscuits is the customer buying in total? You can use the grid method or the column method to work out your answer.

Task 5

Imran puts £49 into a bank account each week. How much is in the account after one year (52 weeks)?

A Few More Multiplication Problems

Task 6

1	8 x 12 =	
2	6 x 11 =	
3	9 x 9 =	
4	3 x 12 =	
5	7 x 8 =	
6	15 x 11 =	
7	21 x 9 =	

Task 7

A sweet shop uses a table to record the number of chocolate bars they sell in one week.

Chocolate	Quantity
White	57
Milk	76
Dark	49

1. During the next week, they expect to sell three times as many bars of white chocolate.
How many will that be?

2. Milk chocolate is the most popular and they sell on average 11 bars a day. How many would they sell:

a. in an average week?

b. in 4 weeks (28 days)?

3. If they were to sell the same number of chocolate bars each week as in the table above, how many bars in total would they sell in 4 weeks (28 days)?

Multiplication in Real Life

Task 8

Joe is a local builder and employs five staff. They are on different rates of pay.

Use your preferred method from this booklet to work out the staff costs for Joe.

Show your working out. There is some more space for rough working out on p31.

1. Matt works 38 hours at £15 per hour

2. Tim works 45 hours at £11 per hour

3. Bill works 31 hours at £23 per hour

Multiplication in Real Life

Task 8

4. Susie works 39 hours at £13 per hour

5. Imran works 44 hours at £17 per hour

6. A contract they are working on will require Joe and his five staff to complete some painting and decorating work in nine hours.

Joe earns £49 per hour, how much will his wages for nine hours be? Remember, this is the same as saying 49 x 9.

7. The other four staff are now being paid the same amount per hour (£49) as Joe for this nine hour project. Now that you have worked out Joe's wages, how much would the total wages be for all staff, including Joe?

Skills Recap

Multiplication is the same as repeated addition, which means adding multiple copies of the same number.

Here are some examples:

- 3 x 3 is the same as saying: 3 + 3 + 3
- 2 x 4 is the same as saying: 2 + 2 + 2 +2
- 5 x 6 is the same as saying: 5 + 5 + 5 + 5 + 5 + 5

Multiplication tables can help you to work out calculations, or parts of bigger calculations.

These are the three methods of multiplication we have looked at:

Grid method
In this method each digit in the number is split up into its place value column and placed in the correct position in the grid.

Column method
Numbers can be multiplied together using the column method which involves writing one number underneath the other.

Long multiplication
This is used when a multiplication made using the column method needs more than one step to solve.

- Once you have read through the recap above, cover it up and see what you can remember.
- You can always look back through your booklet if you are unsure of anything.

Feedback

WWW (What Went Well)

EBI (Even Better If)

Next steps

Learner feedback (Please provide some feedback for your tutor following the comments that you have just made on your work.)

Glossary

Digit	• Any of the numbers 1 to 9 • A single digit number has 1 number (1 - 9) • A 2-digit number has 2 numbers (10 - 99) • A 3-digit number has 3 numbers (100 - 999)
Square number	When two of the same number are multiplied such as 3 x 3 = 9.

Next Steps

Now you have completed Booklet 3, please return this to your tutor/trainer.

Your tutor/trainer will mark the work and provide you with some feedback showing what you have done well and suggestions on improvements.

The next booklet will be provided to you.

Have Your Say

We would be interested in your opinion of this booklet.

1. **Was there anything you found easy in this workbook?** Yes ☐ No ☐
   If you answered yes, what did you find easy?

2. **Was there anything you found hard?** Yes ☐ No ☐
   If you answered yes, what did you find hard?

3. **Is there anything that you would like your tutor to go over again?** Yes ☐ No ☐
   If you answered yes, what is this?

4. **If your tutor provided learning aids, did you use them?** Yes ☐ No ☐
   If you answered yes, how were they useful?

5. **Would you like more support?** Yes ☐ No ☐
   If you answered yes, one of our Support Staff will get in touch with you.

6. **Do you have any questions?**

7. **What have you learnt from this booklet?**

Notes