

Year 2

Small Steps Guidance and Examples

Block 4 – Multiplication & Division

WhiteRoseMaths

Overview

Small Steps

- Recognise equal groups
- Make equal groups
- Add equal groups
- Multiplication sentences using the \times symbol
- Multiplication sentences from pictures
- Use arrays
- 2 times-table
- 5 times-table
- 10 times-table

NC Objectives

Recall and use multiplication and division facts for the 2, 5 and 10 times tables, including recognising odd and even numbers.

Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals ($=$) sign.

Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in contexts.

Show that the multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.

Recognise Equal Groups

Notes and Guidance

At this stage, children are describing equal groups using stem sentences to support them.

It is important that children know what groups are equal and which are unequal.

The addition or multiplication symbol is not used within this small step but this language will support them in understanding repeated addition and multiplication.

The examples included, refer to the times tables facts year 2 children need to know.

Mathematical Talk

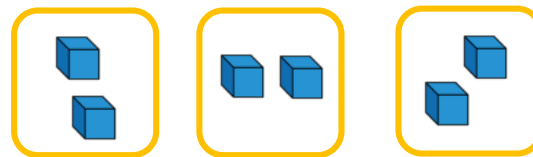
What does the 2 represent? What does the 3 represent?

What does the 5 represent? What does the 2 represent?

I have X equal groups, with Y in each group. Which image am I describing?

Varied Fluency

- 1 Complete the stem sentence.



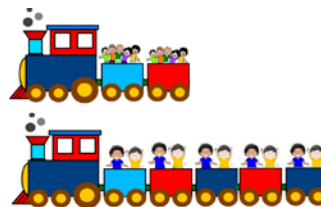
There are ____ equal groups with ____ in each group.

- 2 Complete the sentences.



There are ____ equal groups with ____ in each groups.
I have two ____.

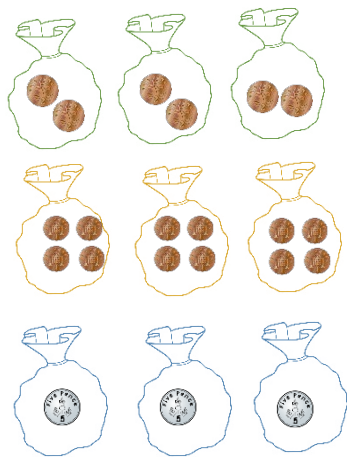
- 3 Describe the equal groups.
What is the same and what is different in each group?



Recognise Equal Groups

Reasoning and Problem Solving

Which group of money is the odd one out?



The bags with 5p in each because the 2ps and 1ps have 4p in each group.

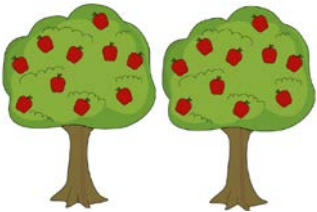
Explain why.

Sort into equal and unequal groups.

Equal groups	Unequal groups

Create your own picture to go in each column.

Spot the mistake.



There are 10 equal groups with 2 in each group. There are ten 2s.

Hearts and dots in unequal groups.

Stars and squares in equal groups.

There are 2 equal groups with 10 in each group

There are two 10s.

Make Equal Groups

Notes and Guidance

The children should be able to make equal groups to demonstrate their understanding of the new language.

With the examples provided to the children, it is important that they are exposed to numerals and words, as well as multiple representations.

Mathematical Talk

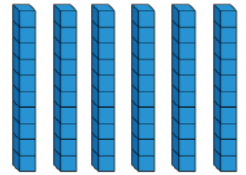
How else could you represent these in equal groups?

How many ways can you represent this?

How have you grouped your items?

Varied Fluency

- 1 The image below shows six equal groups with ten in each group. There are six 10s.



How else can you represent these equal groups?

- 2 How many ways can you represent 'four equal groups with three in each group'.

- 3 What else do we need to show 'five 3s'?

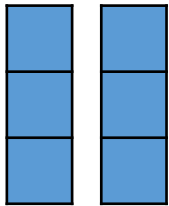


How else can we show five equal groups with three in each group?

Make Equal Groups

Reasoning and Problem Solving

Has Eva shown the equal groups correctly?



Draw or use cubes to show what Eva should have done.

How can you make the groups equal?

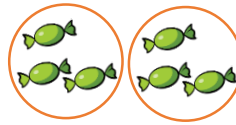


Children to draw picture of 3 towers with 2 in each tower.

Various answers e.g move one star from right to left box.

Any answer that makes them equal.

Match the equal groups together.



Three 5s



Two 10s



Two 3s



Add Equal Groups

Notes and Guidance

Once the children can describe and make equal groups, they can start relating equal groups to repeated addition.

At this point children would have added 3 single digits together, therefore they can add any 3 numbers together. If there are more than 3 equal groups, the examples must be limited to 2s, 5s, 10s and 3s.

Mathematical Talk

What do the two 3s represent?

Why are we using the addition symbol?

How else can we show the equal groups?

What is the total?

Varied Fluency

1

Complete:



There are ___ equal groups with ___ in each group.

There are two ____.

$$__ + __ = 6$$

How else can you represent the equal groups?

2

Complete:



There are ___ equal groups with ___ in each group.

There are three ____.

$$__ + __ + __ = 12$$

3

Fill in the table:

	Draw it
Say it There are ___ equal groups with ___ in each group There are ____	Add it $\square + \square + \square + \square + \square + \square = \square$

Add Equal Groups

Reasoning and Problem Solving

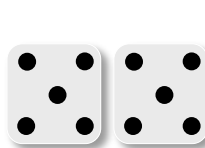
True or False?

$$5 + 5 = 2 + 2 + 2 + 2 + 2$$

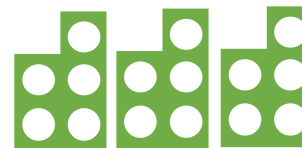
Draw an image or use cubes to help you explain your answer.

This is true because they both equal 10 but the groups look different.

Which one does not belong?



Two 5s



Ten

$$5 + 5 =$$

What do we need to change to make them all represent the same?

The three 5s do not belong, we would have to take away one five.

The Multiplication Symbol

Notes and Guidance

Within this step, the multiplication symbol is introduced for the first time.

Children should link the stem sentences, repeated addition and multiplication together.

They should also be able to interpret mathematical stories and create their own.

The use of concrete resources and pictorial representations is still vital for understanding.

Mathematical Talk

What does the 3 represent? What does the 6 represent?

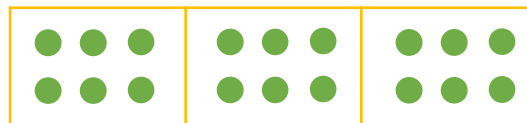
What does lots of mean?

Does $18 = 3 \times 6$ mean the same?

How is $6 + 6 + 6$ the same as 3×6 ?

Varied Fluency

- 1 Complete the sentences to describe the equal groups.



$$\square + \square + \square = 18$$

$$\square \times \square = 18$$

There are __ equal groups with __ in each group.

There are three __.

- 2 Complete the table:


Three 2s	Draw It	Addition	Multiplication
There are 3 equal groups with 2 in each group.			

- 3 Complete:

Addition	Multiplication	Story
$10 + 10 + 10$		
	6×5	

The Multiplication Symbol

Reasoning and Problem Solving

<div><p>3 + 3 + 3 = 3 × 3</p></div> <p>Is he correct? Explain why.</p> <p>Draw an image to help you.</p>	<p>He is correct because $3+3+3=9$ and $3\times3=9$</p>	<p>Think of a multiplication to complete:</p> <p>$6 + 6 + 6 > __ \times __$</p>	<p>Could be: $6+6+6 > 2\times2$ Any answer where it is less than 18</p>
<p>Use $<$, $>$ or $=$ to make the statements correct.</p> <div><div>3×5</div><div><input type="text"/></div><div>$5 + 5 + 5 + 5$</div></div> <div><div>2×2</div><div><input type="text"/></div><div>$2 + 2$</div></div> <div><div>$4 + 4 + 4$</div><div><input type="text"/></div><div>2×2</div></div>	<p>$3\times5 < 5+5+5+5$</p> <p>$2\times2 = 2+2$</p> <p>$4+4+4 > 2\times2$</p>	<p>The total is 12, what could the addition and multiplication be?</p>	<p>$6 + 6$ and 2×6</p> <p>$3 + 3 + 3 + 3 = 4 \times 3$</p> <p>$2 + 2 + 2 + 2 + 2 + 2 = 6 \times 2$</p> <p>$4 + 4 + 4 = 3 \times 4$</p>

Multiplication from Pictures

Notes and Guidance

Similar to recognising equal groups, children will be using the multiplication symbol and working out the total from pictures.

The children should also be able to interpret a word problem by drawing images to help them solve it.

Coins could be used within this small step too.

Mathematical Talk

What does the 4 represent?

What does the 3 represent?

What does the 12 represent?

Can you think of your own story for $3 \times 4 = 12$?

Varied Fluency

1 Complete:



$$\square \times \square =$$

$$\square \text{ lots of } 3 = \square$$

$$\square \text{ multiplied by } \square = 12$$

2 Complete:




4 lots of 3



$$= 2 \times \square$$

3

Fill in the missing boxes:

Picture	Multiplication	Sentence
	$4 \times 10 = 40$	4 lots of 10 is equal to 40
	$35 = 7 \times 5$	
		6 lots of 3 is equal to 18

Multiplication from Pictures

Reasoning and Problem Solving

There are three dolls in each basket.

There are four baskets.

How many dolls are there altogether?

Draw an image and write a calculation to represent the problem.

Write a sensible story for the calculation
 4×10

Draw an image to illustrate your story.

The image could be 4 circles with 3 in each

The calculation
 $3 \times 4 = 12$

A possible story could be; there were four tables with ten children on each table; there were four purses with 10p in each purse etc.

Which calculation does not represent the image?



$$2 \times 5$$

$$5 + 5$$

$$5 \times 2$$

Explain your reasoning.

5×2 does not represent the image because there is not 5 groups with 2 in each group.

Use Arrays

Notes and Guidance

Within this small step children explore arrays to see the commutativity between multiplication facts e.g. $5 \times 2 = 2 \times 5$

The use of the array could be used to help children calculate multiplication statements.

The symbol and language of lots of should be used interchangeably.

Mathematical Talk

Where are the 2 lots of 3?

Where are the 3 lots of 2?

What do you notice?

What can we use to represent the eggs and shells?
Can you draw an image?

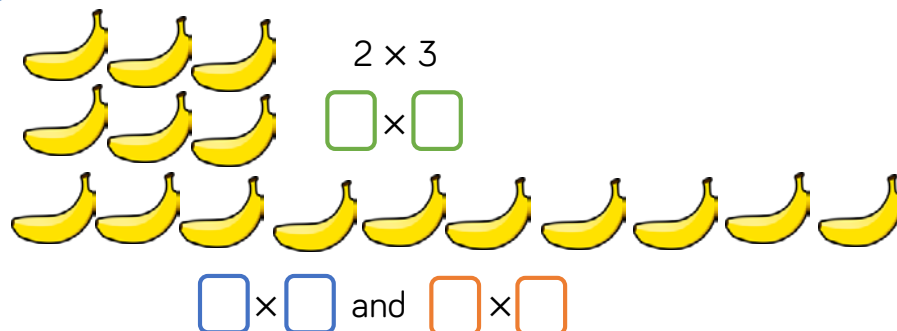
Varied Fluency

- 1 On the image, find 2×5 and 5×2



Can you represent this array using another object?

- 2 Complete the number sentences to describe the arrays.



- 3 Draw an array to show:

$$3 \times 5 = 5 \times 3$$

$$2 \text{ lots of } 10 = 10 \text{ lots of } 2$$

Use Arrays

Reasoning and Problem Solving

With 10 cubes, how many arrays can you create?

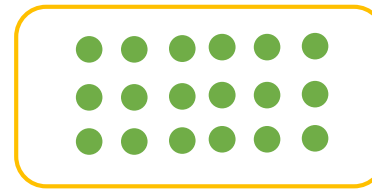
Once you have created your array complete:

$$\square \times \square = \square \times \square$$

$$2 \times 5 = 5 \times 2$$

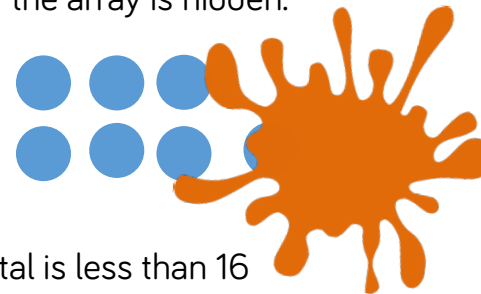
$$1 \times 10 = 10 \times 1$$

Find different ways to solve six lots of three.



Count in 3s
3 lots of 3 add 3
lots of 3
 5×3 add 1×3
Etc

Part of the array is hidden.



The total is less than 16

What could the array be?

4×2
 5×2
 6×2
 7×2
 8×2

The 2 Times Table

Notes and Guidance

At this stage children should be comfortable with the concept of multiplication so they can apply this to their times tables that they need to be secure with.

Images should be used to encourage children to count in twos as well as number tracks. Resources such as cubes and Numicon are important for children to explore equal groups within the 2 times tables.

Mathematical Talk

If there is 16p in total, how many coins would there be?

How many 2s go into 16?

How can the images of the 5 bikes help you to solve the problems?

Varied Fluency

1

Count in 2s to calculate how many eyes there are.

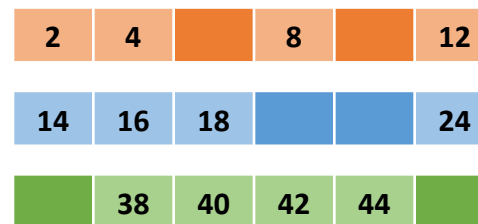


There are eyes in total.

$$\square \times \square = \square$$

2

Complete the number track.



3

There are 14 wheels, how many bikes are there?



The 2 Times Table

Reasoning and Problem Solving

Fill in the missing boxes.

$$3 \times \square = 6$$

$$\square \times 2 = 20$$

$$7 \times 2 = \square$$

2

10

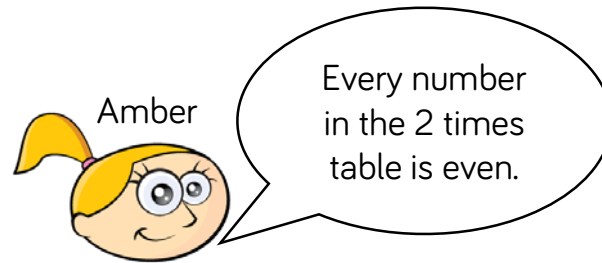
14

Thomas says that $10 \times 2 = 22$

Is he correct?

Explain how you know.

No, the answer should be 20. Children could draw an array or a picture to show their answer.



Is Amber correct?

Explain your answer.

Yes because 2 is even, and the 2 times table is going up in 2s and when you add two even numbers the answer is always even.

The 5 Times Table

Notes and Guidance

Before this small step, children would have counted in 5s from any given number.

The children would have also been exposed to the 2 times tables.

This small step is focused on the 5 times tables and it is important to include the use of zero. Children should see the = sign at both ends of the calculation to understand what it means.

Mathematical Talk

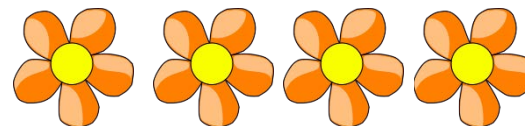
If there are 30 petals, how many flowers? Can you count in 5s to 30? How many 5s go into 30?

How many 5s go into 35?

What does each symbol mean? Do we need to calculate?

Varied Fluency

- 1 How many petals altogether?



Write the calculation.

- 2 There are 35 fingers.
How many hands?



$\times 5 = 35$



- 3 Use <, > or = to make the statements correct.

2×5 5×2

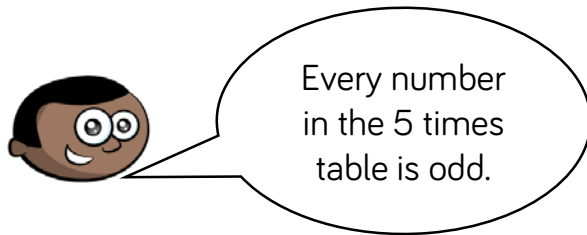
3×2 4×5

10×5 5×5

The 5 Times Table

Reasoning and Problem Solving

Is Hussain correct?



Explain your answer.

Hussain is incorrect because some of the multiples in the five times table are even, e.g. 10, 20, 30

Tubes of bubbles come in packs of 2 and 5.

Lily has 22 tubes of bubbles.

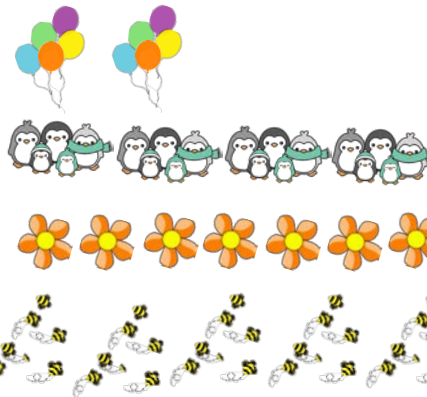
How many of each pack could she have?

How many ways can you do it?



Lily could have 4 packs of 5 and 1 pack of 2 or 11 packs of 2 and 2 packs of 5 and 3 packs of 2

Match the picture to the calculation.

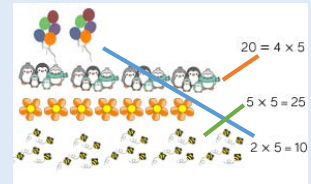


$$20 = 4 \times 5$$

$$5 \times 5 = 25$$

$$2 \times 5 = 10$$

Write a calculation for the picture that is left over.



The missing calculation is $7 \times 5 = 35$

The 10 Times Table

Notes and Guidance

Before this small step, children would have counted in 10s from any given number. This small step is focused on the 10 times tables and it is important to include the use of zero. Children should see the = sign at both ends of the calculation to understand what it means.

Mathematical Talk

What if there were 10 packs of crayons?
If there were 50 crayons altogether, how many packets?
How do you know?

How many tens go into 30? Can you count in 10s to 30?

What does greater than mean?

What does less than mean?

Varied Fluency

- 1 How many crayons are there altogether?



There are crayons altogether.

$$\square \times 10 = \square$$

- 2 Altogether there are 30 bottles, how many walls are there?



$$\square \times 10 = 30$$

- 3 Think of a multiplication fact for 10s to go in each box.

2 x 10		9 x 10	0 x 10		2 x 10
Smallest		Greatest	Smallest		Greatest
	1 x 10	6 x 10		5 x 10	
Smallest		Greatest	Smallest		Greatest

The 10 Times Table

Reasoning and Problem Solving

On sports day, Tom runs 10 metres, 7 times.



Which of the calculations do not describe the word problem?

$10 + 7$
 7×10
 $7 + 7 + 7 + 7 + 7 + 7 + 7$
 $10 + 10 + 10 + 10 + 10 + 10 + 10$

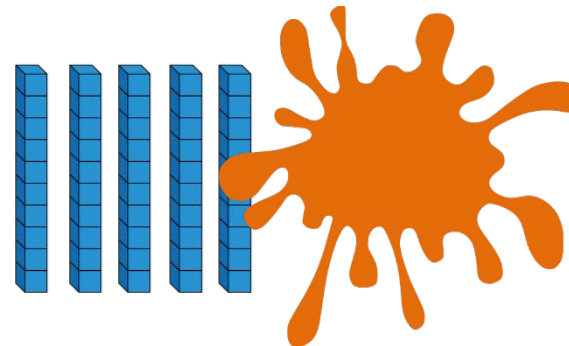
Explain why.

$10 + 7$ is incorrect because he has run 10 metres, 7 times
 $7 + 7 + 7 + 7 + 7 + 7 + 7$ is incorrect because he doesn't run 7 metres. He runs 10 metres.

Some base 10 is hidden.

The total is less than 100

What could the calculation be?



$$\square \times 10 = \square$$

Tim says it could be 10×10
Is he correct? Explain your answer.

It could be
 $5 \times 10 = 50$
 $6 \times 10 = 60$
 $7 \times 10 = 70$
 $8 \times 10 = 80$
 $9 \times 10 = 90$

It can't be 10×10 because 100 is not less than 100