Released December 2017

Years 1/2

Small Steps Guidance and Examples

Block 1 – Multiplication & Division

White Rose Maths

Year 1 /2– Yearly Overview

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value				Number: Addition and Subtraction				Geometry: Shape		Measurement: Money	
Spring	Number: Multiplication and Division (Y1: Place Value to 50 included)				Number: Fractions			Measurement: Length and Height		Measurement: Mass, Capacity and Temperature		Consolidation
Summer	Year 1: Place Value within 100 Year 2: Statistics		Geometry: Position and Direction		Problem solving and efficient methods		Measurement: Time			Investigations		Consolidation

Week 1 to 4 – Number: Multiplication & Division

Overview

Small Steps

Year 1

- Numbers to 50
- Tens and ones
- Represent numbers to 50
- One more one less
- Compare objects within 50
- Compare numbers within 50
- Order numbers within 50
- Count in 2s
- Count in 5s
- Count in 10s

Guidance

This is a good opportunity for year 2 to recap place value before moving on to multiplication and division. Year 1 will need to cover this before they learn the multiplication and division block.

Overview

Small Steps

Year 1	Year 2
	Recognise equal groups
Make equal groups	Make equal groups
Add equal groups	Add equal groups
	The multiplication symbol
	Multiplication from pictures
Make arrays	Use arrays
Make doubles	The 2 times table
	The 5 times table
	The 10 times table
Make equal groups - sharing	Make equal groups - sharing
Make equal groups - grouping	Make equal groups - grouping
	Divide by 2
	Odd & even numbers
	Divide by 5
	Divide by 10

Numbers to 50

Notes and Guidance

Children build on previous learning of numbers to 20
They learn about grouping in 10s and the idea of 1 ten being equal to 10 ones is reinforced.

Children count forwards and backwards within 50 and use a number track to support their understanding of this.

Mathematical Talk

What happens when we get to 10?

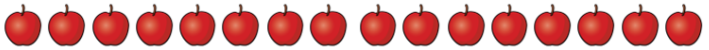
___ ones make ___ ten.

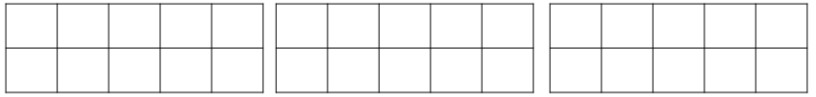
How many groups of 10 can we see in the number ___ ?

How does the ten frame show groups of 10?

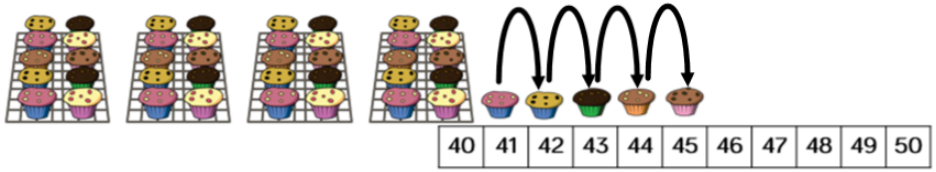
Varied Fluency

1 Use ten frames and counters to show how many apples Joe has.





2 How many muffins are there?



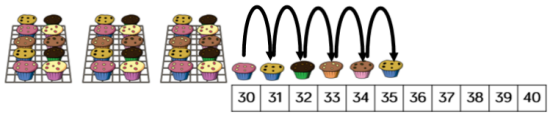
3 Use a number track to
(a) count back from 46 to 38
(b) count forwards from 35 to 49

35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

Numbers to 50

Reasoning and Problem Solving

Alex counts how many muffins she has.



Do you agree with Alex?

Explain your answer.

Possible answer:
I do not agree with Alex because she has counted 30 twice. There should be 36 muffins.

Sasha is counting from 38 to 24

Will she say the number 19?

Explain how you know.

Possible answer:

Sasha will not say 19 because 19 is not between 38 and 24
Children could show this on a number track.

Tens and Ones

Notes and Guidance

Children use their knowledge from the previous step to look at how many groups of tens and ones there are in a number. They will use a range of concrete materials to do this.

It is important that children understand how a number is made up of tens and ones. For example, the number 34 is made up of 3 tens and 4 ones.

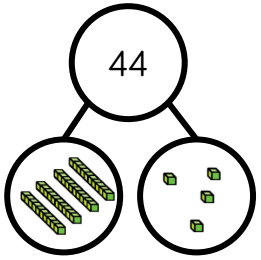
Mathematical Talk

How many tens are there?
How many ones are there?
What number does that make?

How can you exchange ten ones for one ten using different representations?

Varied Fluency

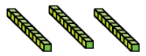
1 How many tens and ones are shown?



There are ___ tens and ___ ones.

___ tens + ___ ones = 44

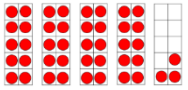
2 What number is represented in the grid?

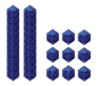
Tens	Ones
	

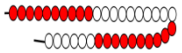
There are ___ tens and ___ ones.
___ tens + ___ ones = ___

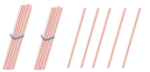
3 Match the image to the correct number.

- Three tens and six ones
- Two tens and five ones
- Four tens and three ones
- Two tens and nine ones





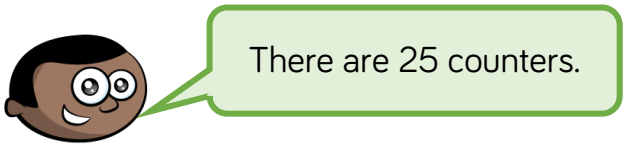




Tens and Ones

Reasoning and Problem Solving

Mo says,



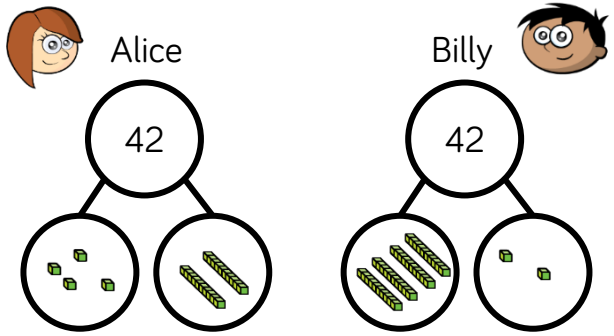
Do you agree with Mo?

Explain your answer.

Possible answer:

I do not agree with Mo because the ten frames are not all full so he doesn't have 2 tens and 5 ones. He has 23 counters.

Alice and Billy both attempt to build the same number.



Who is correct?

Can you explain the mistake that has been made?

Billy is correct.

Alice has got mixed up with tens and ones and shown 4 ones and 2 tens (24)

Represent Numbers to 50

Notes and Guidance

Children represent numbers to 50 using a variety of concrete materials.

Children should be able to state how a number is made up. For example, 29 is made up of 2 tens and 9 ones.

Mathematical Talk

Which part represents the tens?
Which part represents the ones?

What do you notice about the numbers 30?
How many tens are there?
How many ones?

Varied Fluency

1 Using base 10, make the following numbers on the place value chart.

- 29
- 30
- 48

Tens	Ones

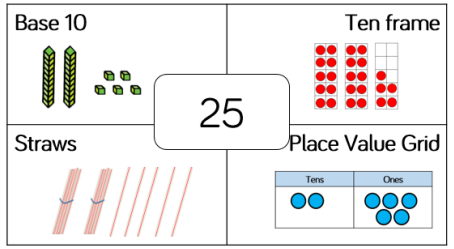
There are ___ tens and ___ ones in ___.

2 Using ten frames and counters, show:

- 19
- 32
- 40

There are ___ tens and ___ ones in ___.

3 How many different ways can you represent the following numbers? Here is an example for 25



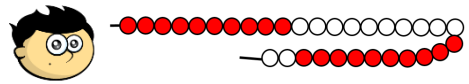
- 34
- 28
- 49

Represent Numbers to 50

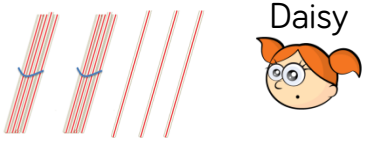
Reasoning and Problem Solving

Alan, Daisy and Oliver have all tried to make 23

Alan



Daisy



Oliver

Can you explain any mistakes made?

Alan is incorrect as he has mixed up his tens and ones and made 32 rather than 23

Kate says,

I have 3 tens and 8 ones. My number must be 308

Explain the mistake Kate has made.

Kate has written 3 tens as 30 instead of just using the digit 3 in the tens column. It should be 38

One More One Less

Notes and Guidance

Building on previous learning of tens and ones, children will start to compare numbers finding one more and one less than given numbers up to 50

Children build numbers concretely before using number tracks and 1–50 grids.

Mathematical Talk

What number is shown? How do you know?

How many tens are there in ___?
How many ones?

When finding one more and one less than, which column changes? Why?

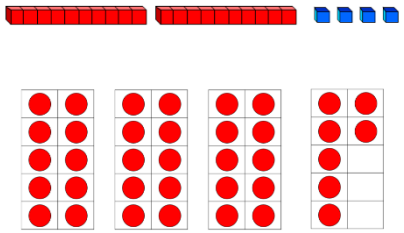
Varied Fluency

1 Fill in the blanks:

There are ___ donuts.
One more than ___ is ___.

There are ___ donuts.
One less than ___ is ___.

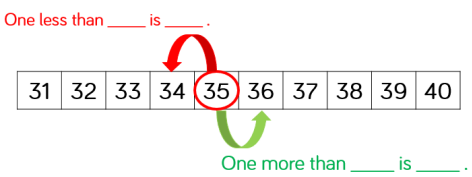
2 Build and find one more and one less.

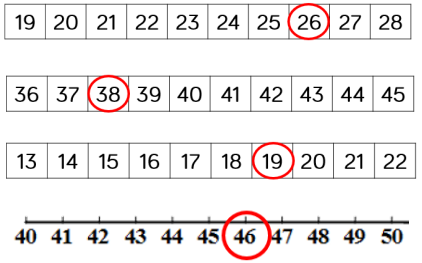


One more than ___ is ___.
One less than ___ is ___.

One more than ___ is ___.
One less than ___ is ___.

3 Find one more and one less:





One More One Less

Reasoning and Problem Solving

19	20	21	23	24	25	26	27	28	29

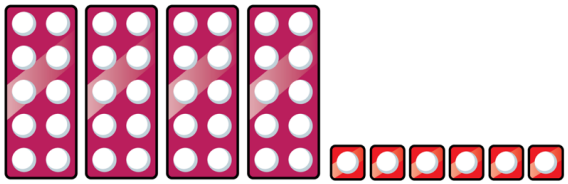
One more than 21 is 23

Do you agree?

Explain your answer.

No, the number track is wrong. The answer should be 22

How many different ways can you represent one more than and one less than this number?



Children could use a number line, number pieces, base ten, place value table etc to represent the numbers 45 and 47

Choose the correct numbers to make the sentences correct.

28	26	33	45
36	43	35	49

☐ is one less than 27

34 is one less than ☐

☐ is one more than 44

50 is one more than ☐

26
35
45
49

Compare Objects within 50

Notes and Guidance

Children compare two sets of objects using the inequality symbols. Children use the language 'more than', 'less than' and 'equal to' alongside the correct symbols.

The way numbers can be built and represented should be explored to find the simplest and easiest way to visualise the numbers when comparing.

Mathematical Talk

What could we use to represent the muffins?

How could we layout the muffins to help us compare?

What do <, > and = mean?

What is the smallest number you could have in the last box on the table.

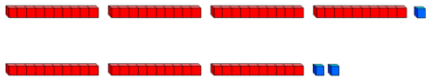
Varied Fluency

1 Craig and Emma each have some muffins.

☐ has the most muffins.

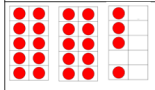
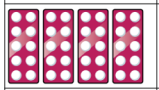
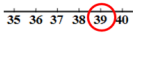
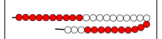
☐ is more than ☐ ☐ > ☐

2 Fill in the blanks:



☐ < ☐ ☐ > ☐

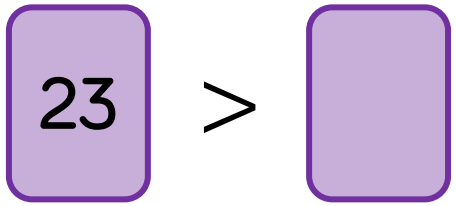
3 Complete the table:

	< > =	
		
		
2 tens and 8 ones		3 tens and 6 ones
	>	

Compare Objects within 50

Reasoning and Problem Solving

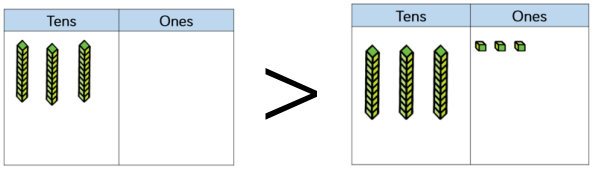
Zoe is thinking of a number that could go in the empty box.
Her number is more than 19



What could Zoe's number be?

20, 21 or 22

Ben compares two numbers.



Do you agree with Ben?

Explain your answer.

Possible answer:
Children may choose to prove Ben wrong by building and representing the numbers shown.

Compare Numbers within 50

Notes and Guidance

Building on previous learning of comparing objects within 50, children compare two numbers using the inequality symbols.

Children use the language 'more than', 'less than' and 'equal to' alongside the correct symbols to compare numbers.

Mathematical Talk

What does <, > and = mean?

How many tens are there in ____? How many ones?

What is one more than ____? What would one less be?

How many more/less is ____ than ____ ?

Varied Fluency

1 Use the number track to compare the two numbers using words and inequality symbols.

19	20	21	23	24	25	26	27	28	29

21 is _____ than 26. 21 ◯ 26

26 is _____ than 21. 26 ◯ 21

29	30	31	32	33	34	35	36	37	38

30 is _____ than 35. 30 ◯ 35

35 is _____ than 30. 35 ◯ 30

2 Use the 1-50 grid to compare using <, > or =

12 ◯ 23

38 ◯ 19

40 ◯ 39 + 1

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

3 Use a number track or 1-50 grid to complete:

15 ◯ 50

28 ◯ 9

33 ◯ 33

38 ◯ 49

2 tens < ☐

☐ > 46

Compare Numbers within 50

Reasoning and Problem Solving

Beth makes a 1-50 grid to help her compare 18 and 13

1	2	3	4	5	6	7	8	9	10
20	19	18	17	16	15	14	13	12	11
21	22	23	24	25	26	27	28	29	30
40	39	38	37	36	35	34	33	32	31
41	42	43	44	45	46	47	48	49	50

Beth thinks that 18 is less than 13

Do you agree?

Can you spot her mistake?

Possible answer:
Beth has incorrectly filled in her 1-50 grid. 18 is greater than 13

Use the 1-50 grid to complete the statements.

12 ◯ 21 21 is _____ than 12

21 ◯ 12 12 is _____ than 21

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

Prove it.

$12 < 21$
21 is more than 12
$21 > 12$
12 is less than 21

Children can prove it using concrete resources e.g. ten frames or place value charts.

Order Numbers within 50

Notes and Guidance

Children order numbers using the language, 'largest', 'smallest', 'biggest', 'greatest', 'least', 'most' and 'equal to'.

They continue to use inequality symbols to order numbers in ascending and descending order.

Mathematical Talk

Which group is the largest? Which group is the smallest?

How many are in group _____?
How many more/less does group ___ have than group ___?

Can you build the groups using cubes and compare? Explain what you notice.

What is the smallest/largest number that could complete the empty box?

Varied Fluency

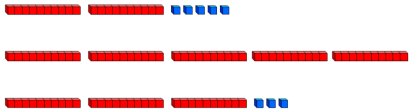
1 Order the groups of cubes starting with the largest group.

Group 1 

Group 2 

Group 3 

2 Order the three numbers from smallest to biggest:



□ < □ < □

Using base 10, build and order from biggest to smallest:

- 23, 49, 19
- 11, 33, 22
- 41, 14, 42, 24

3 Use the four numbers to complete the statement.

11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

□ > □ > □ > □

Order Numbers within 50

Reasoning and Problem Solving

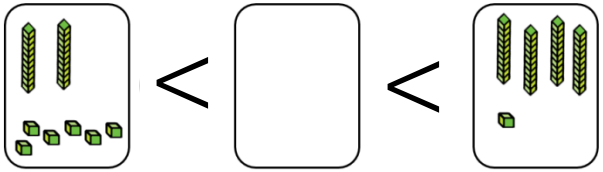
Spot the Mistake

$12 > 21 > 33 > 35$

Can you correct it?

The wrong inequality symbol has been used.
It should be
$12 < 21 < 33 < 35$
or
$35 > 33 > 21 > 12$

Find at least 5 different numbers that could complete the statement.



Possible answers:
27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40

Count in 2s

Notes and Guidance

Children build on previous learning of counting in twos and go beyond 20 up to 50

They will apply previous learning of one more and one less to counting forwards and backwards in twos. For example, two more than and two less than. The 1-50 grid will be used to spot and discuss patterns that emerge when counting in 2s.

Mathematical Talk

How can we count the socks and gloves?
What does it mean to count in pairs?

Can you describe the pattern on the grid? Why do you think this happens?

What do you notice about the digits in the ones column for each of the numbers shaded in your grid?

Will 25 appear on our number line? Why?

Varied Fluency

1 How many socks are there?

There are ___ socks in total.

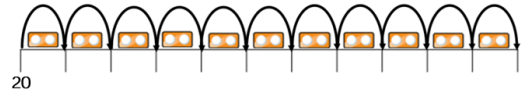
How many gloves are there?

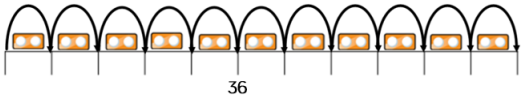
There are ___ gloves in total.

2 Continue counting in 2s on the grid.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

3 Complete the number lines by counting in 2s.





Count in 2s

Reasoning and Problem Solving

Count in 2s backwards to complete the number track.

46	44	42	40	?	?	?

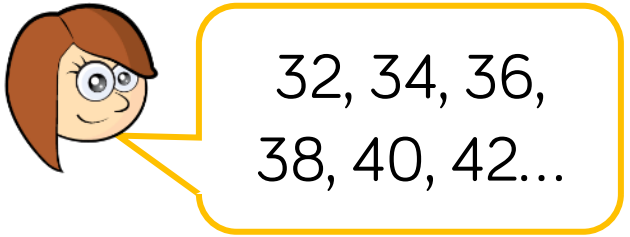
2 less 2 less 2 less 2 less 2 less 2 less

Explain how you got your answer.

38, 36, 34

Children should explain how they count backwards in 2s

Jess thinks that if she continues counting in 2s, she will say the number 49



Do you agree?

Explain why.

Jess is wrong. She will say 44, 46, 48, 50 and miss out 49

Count in 5s

Notes and Guidance

Children build on previous learning of counting in fives to go beyond 20 and up to 50

The 1-50 grid will be used to spot and discuss patterns that emerge when counting in 5s.

Mathematical Talk

How can we count the fish and grapes?

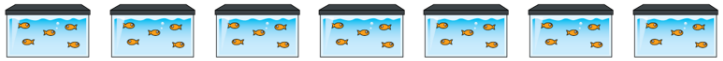
Can you describe the pattern on the grid? Why do you think this happens?

What do you notice about the digits in the ones column for each of the numbers shaded in the grid?

Will _____ appear on our number line? Why?

Varied Fluency

1 How many fish are there?



There are ___ fish in each tank.
There are ___ tanks.
There are ___ fish altogether.

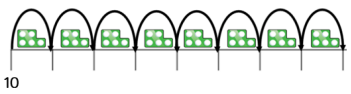
How many grapes are there?

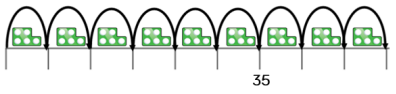
There are ___ grapes in each bunch.
There are ___ bunches.
There are ___ grapes altogether.

2 Continue counting in 5s on the grid.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

3 Complete the number lines by counting in 5s.

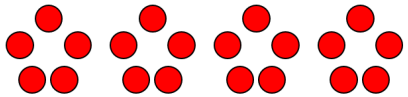




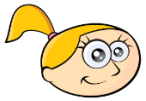
Count in 5s

Reasoning and Problem Solving

Amy is making this flower pattern with counters.



Rachel says,



If you make 9 flowers, you will use 43 counters.

Do you agree with Rachel?

Explain your answer.

Rachel is wrong because 43 does not end in a 5 or a 0

If she makes 9 flowers she will use 45 counters

Jenson counts the pencils in 5s.
He says he has 25 pencils.

Do you agree with Jenson?

Explain your answer.

There are 30 pencils.

Jenson said 0 when there were 5 at the start.

Jenson started counting at 0 when he should have started counting at 5

Count in 10s

Notes and Guidance

Children count in tens for the first time.

They use pictures, bead strings and number lines to support their counting.

Counting in 10s on a hundred square will also support children to see the similarities between the numbers when we count in tens.

Mathematical Talk

How can we count the birds and flowers?

Will _____ appear on our number line? Why?

What is the same about all the numbers we say when we are counting in tens?

Varied Fluency

1 How many birds are there altogether?

There are _____ birds in each tree.
There are _____ trees.
There are _____ birds altogether.

2 How many flowers are there altogether?

There are _____ flowers in each bunch.
There are _____ bunches.
There are _____ flowers altogether.

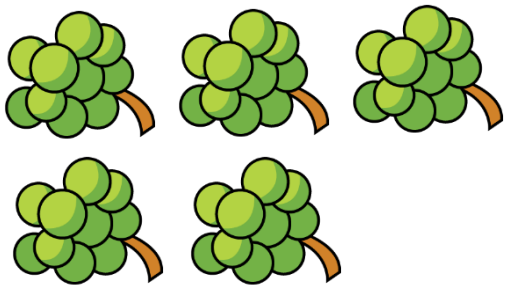
3 Use a 0-100 bead string to count in tens.
Can we count forwards and backwards in tens?

Can we count in tens on a number line as well?
How does this match counting on a bead string?

Count in 10s

Reasoning and Problem Solving

Here are the grapes in a shop.



Max wants to buy forty grapes.

Are there enough grapes?

Yes there are enough grapes. There are fifty grapes and Max only needs forty.

Jemima is counting in 10s on a hundred square.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

She starts at 10

- Shade in all the numbers Jemima will say.
- What is the same about the numbers she says?

What is different about the numbers?

Jemima will say 10, 20, 30, 40 and 50
All the numbers have the same ones digit (0)
They all have different tens digit.
The tens digit goes up by 1 for each new number she says.

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

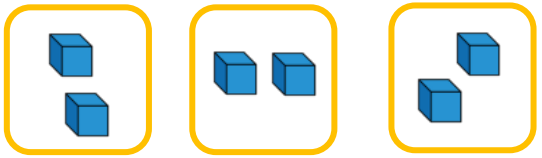
What does the 2 represent? What does the 3 represent?

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?

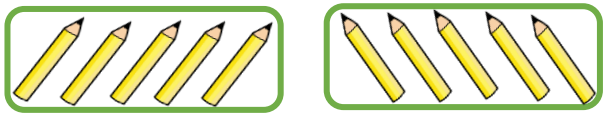
Varied Fluency

1 Complete the stem sentence.



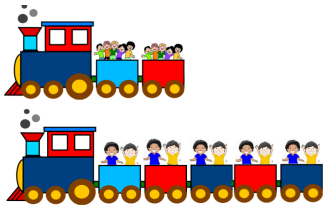
There are ____ equal groups with ____ in each group.

2 Complete the sentences.



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

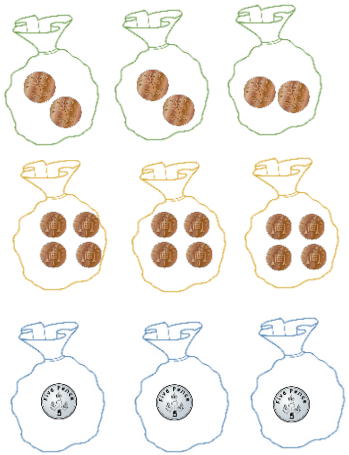
3 Describe the equal groups.
What is the same and what is different in each group?



Recognise Equal Groups

Reasoning and Problem Solving

Which group of money is the odd one out?

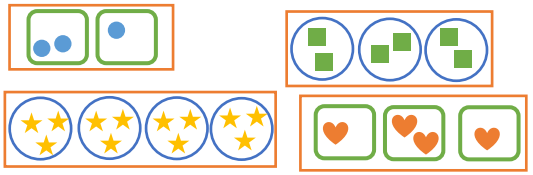


Explain why.

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

Sort into equal and unequal groups.

Equal groups	Unequal groups

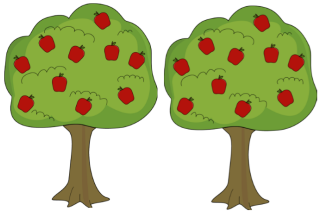


Create your own picture to go in each column.

Hearts and dots in unequal groups.

Stars and squares in equal groups.

Spot the mistake.



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

There are 2 equal groups with 10 in each group

There are two 10s.

Make Equal Groups

Notes and Guidance

Children use stories, pictures and concrete manipulatives to explore making equal groups and write statements such as 'there are ___ groups of ___.' They will identify whether groups are equal or not. Children will look at groups that look different but are the same.

At this stage children do not explore multiplication formally.

Mathematical Talk

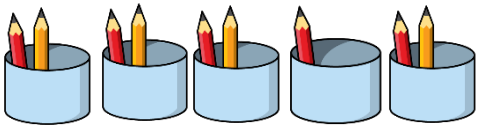
How do I know groups are equal? What does equal mean?

How many *pencils* are there in each *pot?* How can I complete the sentence to describe the groups.

Are Josh's groups equal or unequal? How can we make them equal?

Varied Fluency

1 Are the groups equal or unequal? Write a label for each.



2 Complete the sentences

There are ___ groups of ___ pencils.

There are ___ groups of ___ flowers.

3 Josh is drawing equal groups of 3

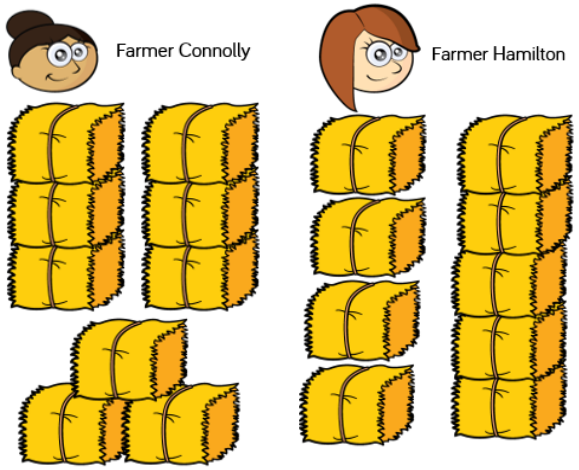
Complete his drawing.

Make Equal Groups

Reasoning and Problem Solving

Farmer Hamilton and Farmer Connolly are making hay bundles.

Who made equal groups?



Possible answer:

Farmer Connolly has because she has 3 groups of 3 hay bundles.

Farmer Hamilton's look the same but they are not.

Use concrete materials or pictures to complete the questions.

Jemima has 4 equal groups.
Show me what Jemima's groups could look like.

Kim has 3 unequal groups.
Show me what Kim's groups could look like.

Children will show 4 groups where there are the same amount in each group for Jemima and 3 groups that are unequal for Kim.

Encourage children to do this in more than one way.

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

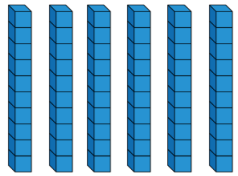
How else could you represent these in equal groups?

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'.

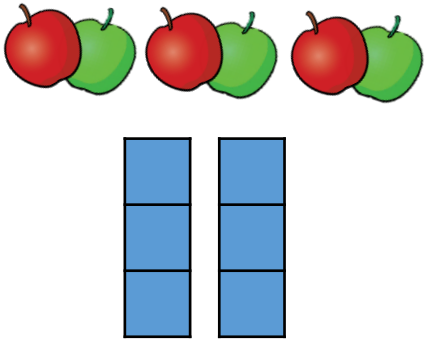
3 What else do we need to show 'five 3s'?

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.

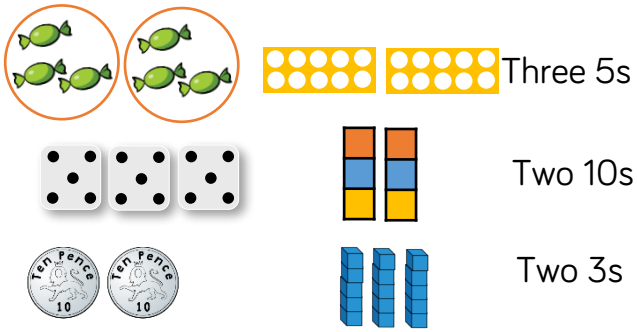
Children to draw picture of 3 towers with 2 in each tower.

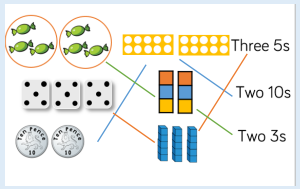
How can you make the groups equal?

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

Any answer that makes them equal.

Match the equal groups together.





Add Equal Groups

Notes and Guidance

Children use equal groups to find a total. They focus on counting equal groups of 2, 5 and 10 and explore this within 50.
Children begin by linking this to real life, for example animal legs, wheels, flowers in vases etc.
Children then begin to represent the equal groups pictorially and with number sentences.

Mathematical Talk

How many apples are there in each bag?

How can we represent this with counters/cubes/on a number line/in a number sentence etc?

What other equipment could you use to represent your pattern? What's the same? What's different?

Which is more, 3 groups of 10 or 4 groups of 5? Prove why.

Varied Fluency

1 How many wheels altogether?

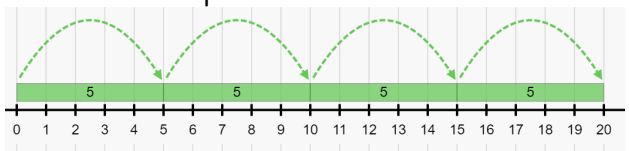
2 + 2 + 2 + 2 + 2 =

How many fingers altogether?

5 + 5 + 5 =

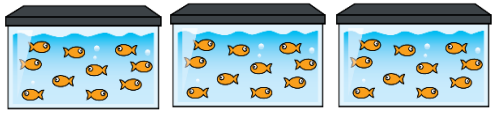
2 How many apples are there? Complete the sentences.

5 + 5 + 5 + 5 = ____

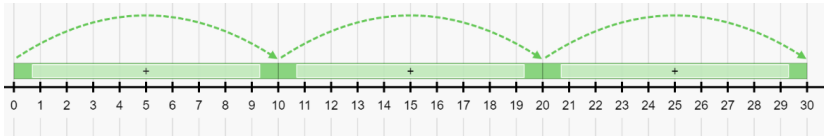


There are ____ apples.
There are ____ groups of ____ apples which is equivalent to ___

3 How many fish are there?
Complete the sentences and the number line.



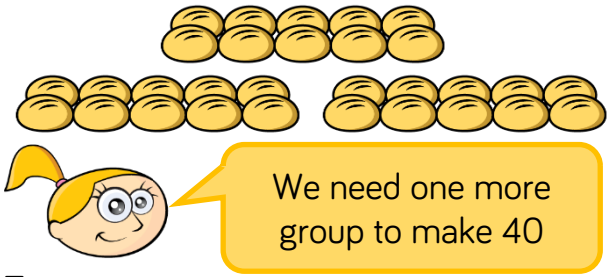
___ + ___ + ___ = ___
There are ____ fish.



Add Equal Groups

Reasoning and Problem Solving

Tania and Suzie are making equal groups of bread.



Who do you agree with? Explain why.

Possible answer:
I agree with both. They are counting in groups of 10 so they need one more group of 10.

Gavin is counting bananas.

3 + 5 = 8

Can you spot his mistake?

Possible answer:
Gavin has written three for three groups and five for five bananas.

Tash and Jane have equal groups of either 2, 5 or 10.

Jane has 5 equal groups.

Tash has 3 equal groups.

Tash's total is more than Jane's total.

Each of their totals is less than 40.

What could they be counting in?
What could there totals be?
How many will be in each group?

Use equipment to help you.

Answer:
Tash must have a larger group than Jane because she has less groups but her total is more.

They could have:
Jane: 2 + 2 + 2 + 2 + 2 = 10
Tash: 5 + 5 + 5 = 15

Jane: 5 + 5 + 5 + 5 + 5 = 25
Tash: 10 + 10 + 10 = 30

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

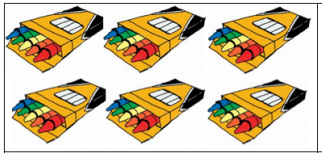
1 Complete:

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 □ + □ + □ + □ + □ + □ = □

Add Equal Groups

Reasoning and Problem Solving

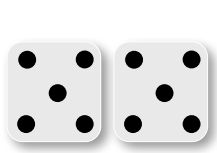
True or False?

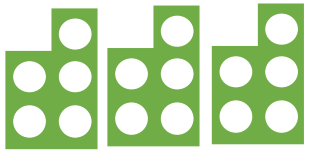
$5 + 5 = 2 + 2 + 2 + 2 + 2$

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?

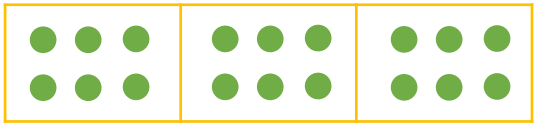
What does lots of mean?

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:

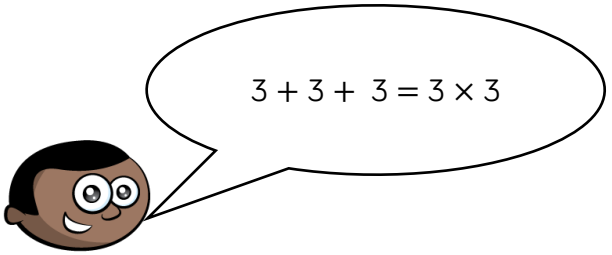
Three 2s	Draw It	Addition	Multiplication
There are 3 equal groups with 2 in each group.			

3 Complete:

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

The Multiplication Symbol

Reasoning and Problem Solving



Is he correct? Explain why.

Draw an image to help you.

He is correct because 3+3+3=9 and 3×3=9

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

3 × 5	☐	5 + 5 + 5 + 5
2 × 2	☐	2 + 2
4 + 4 + 4	☐	2 × 2

3×5 < 5+5+5+5

2×2 = 2+2

4+4+4 > 2×2

Think of a multiplication to complete:

6 + 6 + 6 > ___ × ___

Could be:
6+6+6 > 2×2
Any answer where it is less than 18

The total is 12, what could the addition and multiplication be?

6 + 6 and 2 × 6

3 + 3 + 3 + 3 = 4 × 3

2 + 2 + 2 + 2 + 2 + 2 = 6 × 2

4 + 4 + 4 = 3 × 4

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 x 4 = 12?

Varied Fluency

1 Complete:

□ × □ =

□ lots of 3 = □

□ multiplied by □ = 12

2 Complete:

4 lots of 3 □

□

= 2 × □

3 Fill in the missing boxes:

Picture	Multiplication	Sentence
	4 × 10 = 40	4 lots of 10 is equal to 40
	35 = 7 × 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 and image and write a calculation to represent the problem.

The image could be 4 circles with 3 in each

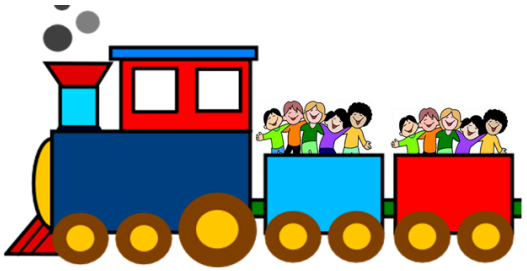
The calculation $3 \times 4 = 12$

Write a sensible story for the calculation 4×10

Draw an image to illustrate your story.

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.

How many different calculations can you see in this image?



Explain your reasoning.

Possible answers:

5×2

2×5

$5 + 5$

2 lots of 5

5 lots of 2

etc

Make Arrays

Notes and Guidance

Children begin to make arrays by making equal groups and building them up in columns or rows.

They use a range of concrete and pictorial representations alongside sentence stems to support their understanding.

Children also explore arrays built incorrectly and recognise the importance of columns and rows.

Mathematical Talk

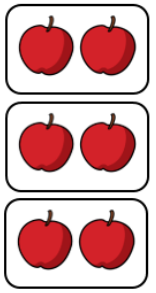
How many equal groups do I have? How many in each group?
Can I represent my *apples* with counters?

How many counters in each row? How many counters in each column?

How can I record my array with a number sentence?

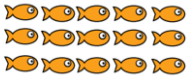
Varied Fluency

1 Build the array shown with counters.
Complete the sentences.



There are ____ apples in each row.
There are ____ rows.
____ + ____ + ____ = ____
There are ____ apples altogether.

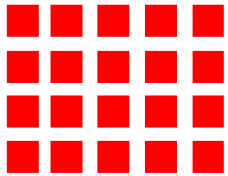
2 Complete the table.

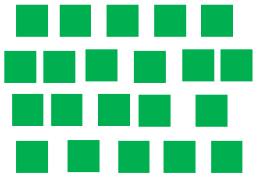
Array	Description - columns	Description - rows	Totals
	5 columns 2 cookies in each column	2 rows 5 cookies in each row	2 + 2 + 2 + 2 + 2 = 10 5 + 5 = 10
	___ columns ___ donuts in each column	___ rows ___ donuts in each row	
	___ columns ___ fish in each column	___ rows ___ fish in each row	
	3 columns 5 cupcakes in each column	5 rows 3 cupcakes in each row	

Make Arrays

Reasoning and Problem Solving

Mo and Libby are making arrays.

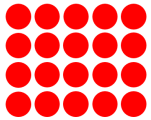


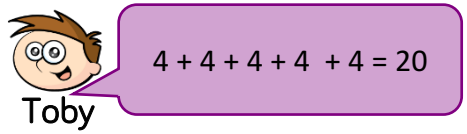


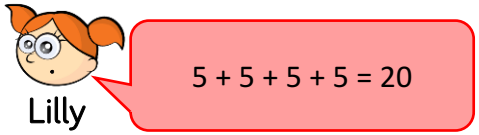
Who has made a mistake? Explain why.

Possible answer:
Libby has made a mistake because her array is not in columns. There are an unequal amount of squares in each row.

Toby and Lilly are writing number sentences to describe the array.





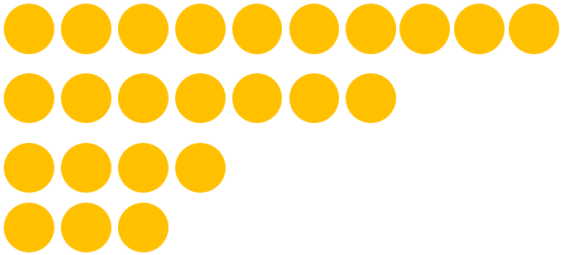


Who do you agree with? Explain why.

Possible answer:

They are both right. Toby has counted the columns. Lilly has counted the rows.

Jenny makes an array but stops.
She has finished her first row.
Can you complete her array?



Possible answer:
Array showing 10 + 10 + 10 + 10 = 40

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?

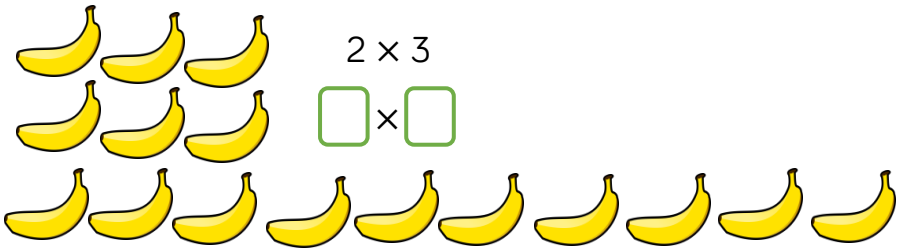
What can we use to represent the eggs and shells?
Can you draw an image?

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 lots of 10 = 10 lots of 2

Use Arrays

Reasoning and Problem Solving

With 10 cubes, how many arrays can you create?

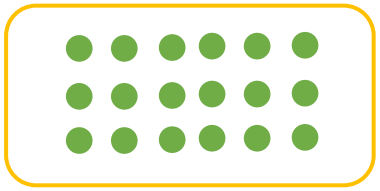
Once you have created your array complete:

□ × □ = □ × □

$2 \times 5 = 5 \times 2$

$1 \times 10 = 10 \times 1$

Find different ways to solve six lots of three.



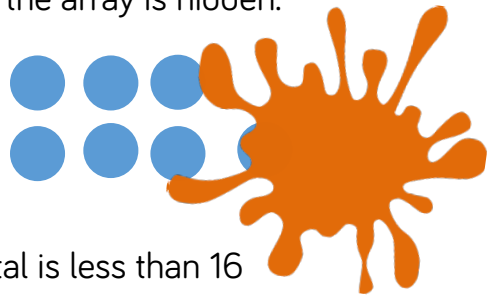
Count in 3s

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

Make Doubles

Notes and Guidance

Children explore doubling with numbers up to 20. They look at representations to decide whether that shows doubling or not.

Children show and explain what doubling means using concrete and pictorial representations.

They record doubling using the sentence 'Double ___ is ____.'

Mathematical Talk

Can you sort these representations in to doubles and not doubles? How do you know they've been doubled?

Which ones are confusing? Why?

Take the number pieces and double it. What is double ____ ?

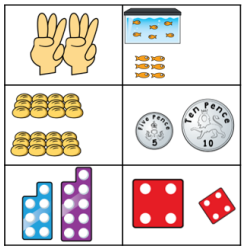
What comes next in my table, why?

How can we show the double differently?

Varied Fluency

1 Sort the representations into the table. Which show doubles and which do not?

Doubles	Not doubles

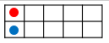
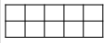


2 Take a number piece and double it. Complete the sentence.

 Double ____ is ____

 Double ____ is ____

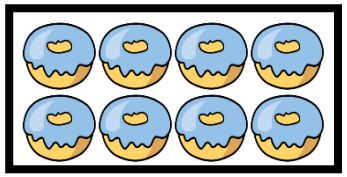
3 Complete and continue the table.

Representation	Different Representation	Double
		Double 1 is 2 1 + 1 = 2
		Double 2 is ___ 2 + 2 = ___
		Double ___ is ___ ___ + ___ = ___
		Double ___ is ___ ___ + ___ = ___

Make Doubles

Reasoning and Problem Solving

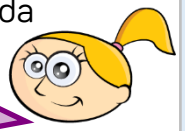
Louise doubles her donuts. The image shows what she had after she doubled her donuts.



Sandy

Louise started with 4 and ended with 8 donuts.

Matilda



Louise started with 8 and ended with 16 donuts.

Nate

Louise started with 2 and ended with 4 donuts.

Who do you agree with? Explain why.

Possible answer:
Sandy is correct because the image shows what she was left with. She had 8 after she doubled and double 4 is 8.

Work out:

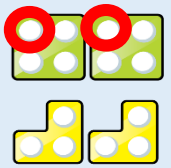
Double 3 =
Double 4 =
Double 5 =

What do you notice? What's the same? What's different?

Now try:
Double 2 =
Double 4 =
Double 8 =

What do you notice? What's the same? What's different?

Possible answer:
Double 3 = 6
Double 4 = 8
Double 5 = 10
The answer gets two more because the start number gets two more ones added for example,



Double 2 = 4
Double 4 = 8
Double 8 = 16
The first number doubles and the last number doubles.

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

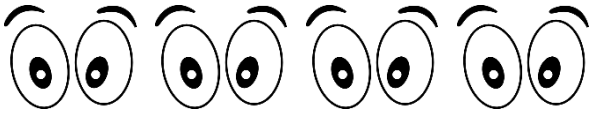
If there is 16p in total, how many coins would there be?

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.

☐ × ☐ = ☐

2 Complete the number track.

2	4		8		12
14	16	18			24
	38	40	42	44	

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

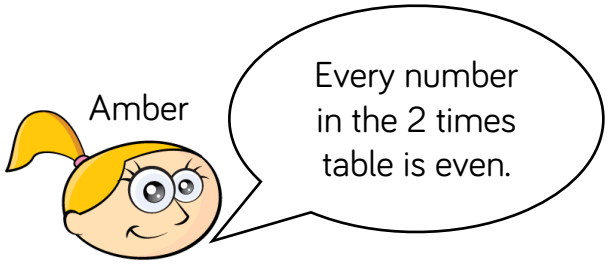
14

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

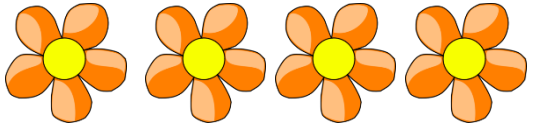
If there are 30 petals, how many flowers? Can you count in 5s to 30? How many 5s go into 30?

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?

$\square \times 5 = 35$

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

$2 \times 5 \bigcirc 5 \times 2$

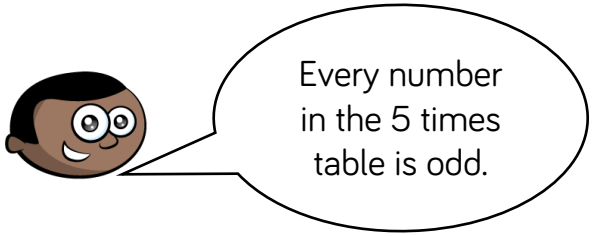
$3 \times 2 \bigcirc 4 \times 5$

$10 \times 5 \bigcirc 5 \times 5$

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.

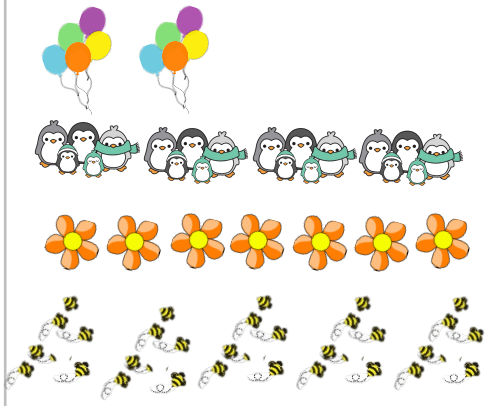
Lily has 22 tubes of bubbles.

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.

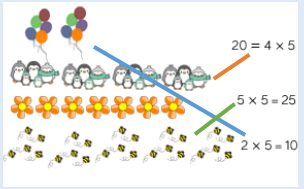


$20 = 4 \times 5$

$5 \times 5 = 25$

$2 \times 5 = 10$

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?

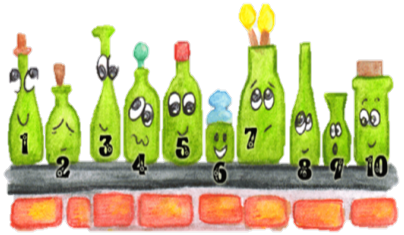
Varied Fluency

1 How many crayons are there altogether?

There are ☐ crayons altogether.

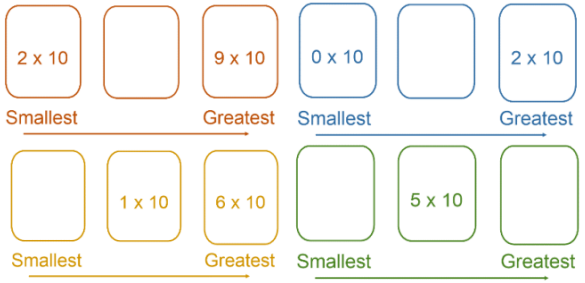
☐ × 10 = ☐

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



☐ × 10 = 30

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



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.

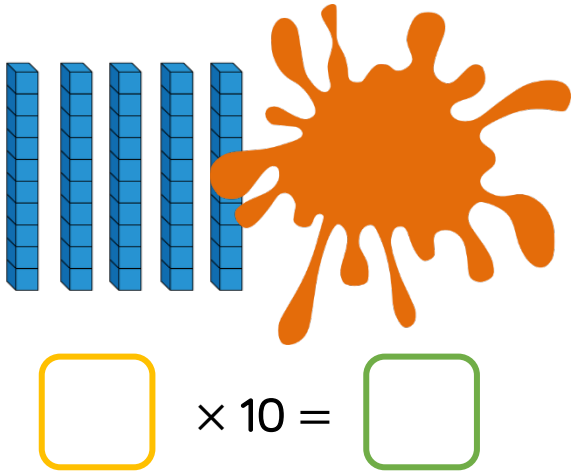
10 + 7 is incorrect because he has run 10 metres, 7 times

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?



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

It could be
5 x 10= 50
6 x 10= 60
7 x 10=70
8 x 10= 80
9 x 10 = 90

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

Make Equal Groups - Sharing

Notes and Guidance

Children will explore sharing practically by using 1:1 correspondence. To begin with, children need to represent the groups they are sharing into with a physical object or a pictorial representation. For example, share the 12 balls between the two buckets. Share the 12 dots between the two circles.

Children should also be exposed to opportunities where an amount will not share equally.

Mathematical Talk

How can I share the muffins equally?

How many muffins on this plate? How many on this plate? Are they equal? If I had 9 muffins what would happen?

How can I share ___ between ___ ?

How can I represent this number story? What do the *cubes* represent (bananas)? What do the *trays* represent (boxes)?

Varied Fluency

1 Share the muffins equally between the two plates.
Complete the sentence
___ cakes shared equally between 2 is ___

2 Use 20 cubes and hoops to represent your friends.
Can you share the cubes between 5 friends?
20 shared between 5 equals ____
Can you share the cubes between 2 friends?
20 shared between 2 equals ____
Can you share the cubes between 10 friends?
20 shared between 10 equals ____

3 Tim has 16 bananas.
He shares them equally between two boxes.
Represent and solve the problem.

Make Equal Groups - Sharing

Reasoning and Problem Solving

Each child has the same amount of sweets. The amount of sweets they have is less than 20.
They share the sweets equally in different ways. Can you work out how many they had to begin with?

Max

I share my sweets between two bags and have none left over.

I share my sweets between five bags and have one left over.

Lexi

Robin

I share my sweets between ten bags and have 6 left over

Answer: 16

Grant and Lauren are sharing 5 cakes.

Grant

I should get the left over cake because I bought them.

Lauren

Nobody should get the left over cake.

Who is being fair?
Explain why.

Possible answer:

Lauren is being fair because they will both get equal amount of cakes. They will have two each.

Make Equal Groups - Sharing

Notes and Guidance

Children divide by sharing to make equal groups using one to one correspondence. They need to do this in practical contexts then pictorially.

Children will be introduced to the ÷ symbol. They will begin to see the link between division and multiplication.

Mathematical Talk

How many do you have to begin with?
How many equal groups are you sharing between?
How many are in each group?
How do you know that you have shared the objects equally?

___ has been shared equally in to ___ equal groups.
___ groups of ___ make ____

Varied Fluency

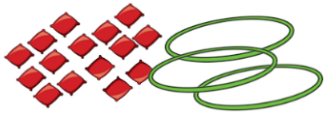
1 Practically share the 12 cubes into the two boxes.

There are ___ cubes altogether.
There are ___ boxes.
There are ___ cubes in each box.

Can you share the 12 cubes into 3 boxes?

2 Share 15 beanbags between the 3 hoops.

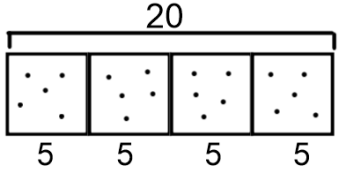
15 ÷ 3 = ☐



Share 12 beanbags between 3 hoops in the same way.

12 ÷ 3 = ☐

3 Billy draws this bar model to divide 20 between 4 equal groups.
He writes 20 ÷ 4 = 5

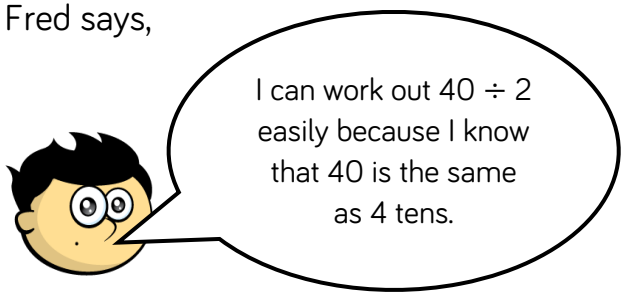


What other number sentences could Billy create using his model?

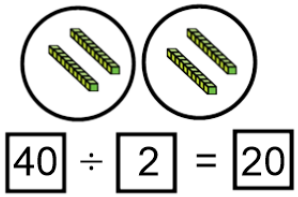
Make Equal Groups - Sharing

Reasoning and Problem Solving

Fred says,

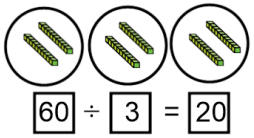


This is what he does:

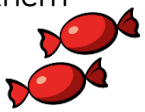


Is it possible to work out 60 ÷ 3 in the same way?
Prove it

Possible answer:



Jane has 20 sweets and shares them between 5 friends.



Tom has 20 sweets and shares them between 10 friends.

Whose friends will receive the most sweets?

How do you know?

Jane's friends get more because Tom is sharing with more people so they will get fewer sweets each. Jane's friends will get 4 sweets each whereas Tom's friends will only get 2 sweets each.

Make Equal Groups - Grouping

Notes and Guidance

Children start with a given total and make groups of an equal amount. They record their understanding in sentences, not through formal division at this stage.

Children can develop their understanding of equal groups by also being exposed to numbers which do not group equally.

Mathematical Talk

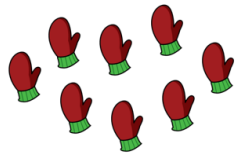
We have ___ *mittens* how many equal groups of 2/5/10 can I make?

What would happen if there were 21 cubes?

Have I got equal groups? Does each group need to look the same for it to be equal still? What makes it equal?

Varied Fluency

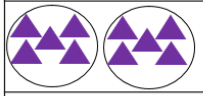
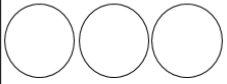
1. How many equal groups of 2 can you make with the mittens?



There are ____ groups of 2 mitten
If you had 10 mittens, how many equal groups of 2 mittens could you make?

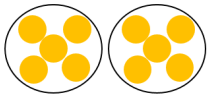
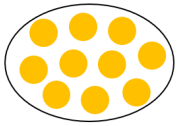
2. Take 20 cubes. Complete the sentences.
I can make ____ equal groups of 2
I can make ____ equal groups of 5
I can make ____ equal groups of 10

3. Complete the table. Use equipment to help you.

Representation	Description
	6 has been sorted into 3 equal groups of 2
	___ has been sorted into ___ equal groups of ___
	15 has been sorted into 3 equal groups of 5.
	___ has been sorted into ___ equal groups of ___

Make Equal Groups - Grouping

Reasoning and Problem Solving

Zeb and Paulo each have the same amount of sweets. They each have less than 20 sweets. Zeb has 5 equal groups of sweets. Paulo has grouped his sweets in tens. How many sweets do they each have?	Answer: 10 Zeb has 5 equal groups of 2 = 10 Paulo has 1 equal group of 10 = 10
Look at the different images. What's the same? What's different? a.  b.  c. 	Possible answer: They all equal 10 a is 5 equal groups of 2 b is 2 equal groups of 5 c is 1 equal group of 10

I am thinking of a number between 20 and 30 I can only make equal groups of 5 with it. What must my number be? What happens when I try make groups of 2 with it? What happens when I try make groups of 10 with it?	Answer: 25 Children can use practical equipment to solve this and discover what happens. If you make equal groups of 2 with it there will be 1 left over. If you make equal groups of 10 with it there will be 5 left over.

Make Equal Groups - Grouping

Notes and Guidance

Children divide by grouping objects into a given amount. They then count on to find the total number of groups.

They need to do this in practical contexts then pictorially.

They need to recognise the link between division, multiplication and repeated addition.

Mathematical Talk

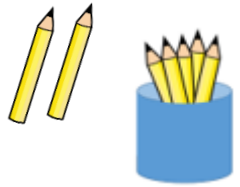
How many do you have to begin with?
How many are in each group?
How many groups do you have?

How long should your number line be?
What will you count up in?

There are _____ groups of _____ which make _____

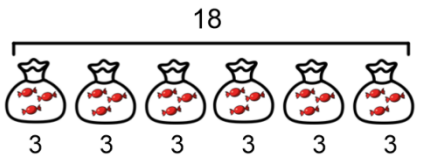
Varied Fluency

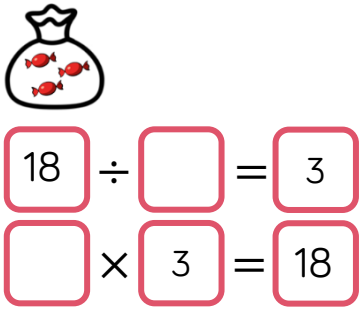
1 Pencils come in packs of 20
We need to put 5 in each pot
How many pots will we need?



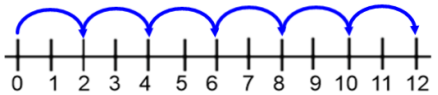
There are ___ pencils altogether.
There are ___ pencils in each pot.
There are ___ pots.

2 Mrs Green has 18 sweets.
She puts 3 sweets in each bag.
How many bags can she fill?





3 Tim uses a number line to work out how many equal groups of 2 he can make from 12



Use a number line to work out how many equal groups of 5 you can make from 30

Make Equal Groups - Grouping

Reasoning and Problem Solving

You have 30 counters.

How many equal groups can you make?

Represent you groups as a number sentence.

10 groups of 3
3 groups of 10
6 groups of 5
5 groups of 6
2 groups of 15
15 groups of 2

Tom has 5 equal groups.

The amount he started with is greater than 10 but less than 35

What could he have started with?

How many will be in each group?

$30 \div 5 = 6$
$25 \div 5 = 5$
$20 \div 5 = 4$
$15 \div 5 = 3$

Divide by 2

Notes and Guidance

Children should be secure with grouping and sharing. They will use this knowledge to help them divide by 2.

They will be secure with representing division as an abstract number sentence using the division and equals symbol.

Children should be able to count in 2s and know their 2× table.

Mathematical Talk

What do you notice when you group these objects into twos?

Is there a link between dividing by 2 and halving?

What is different about sharing into two groups and grouping in twos?

Can we write a multiplication sentences as well as a division sentence? What do you notice?

Varied Fluency

1 Complete the stem sentences.

□ ÷ □ = □

□ × □ = □

I have ___ cubes altogether.
There are ___ in each group.
There are ___ groups.

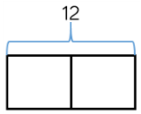
2 Group the socks into pairs.

□ ÷ □ = □ □ × □ = □

3 Sam and Tom have 12 sweets between them. They share them equally. How many sweets does each child get?

There are ___ sweets altogether.
There are ___ groups.
There are ___ in each group.

Complete the bar model to show this calculation.



□ ÷ □ = □ □ × □ = □

Divide by 2

Reasoning and Problem Solving

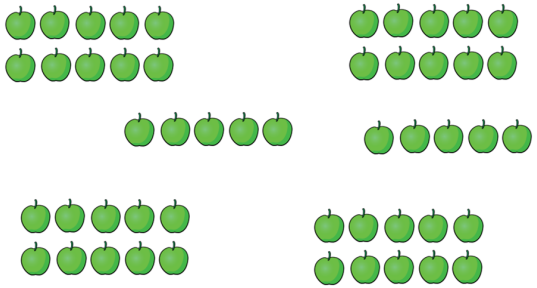
I have 24 p and divide it between 2 friends. How much will they get each?

I have 24 p in 2 pence pieces. How many 2 pence pieces do I have?

What is the same and what's different?

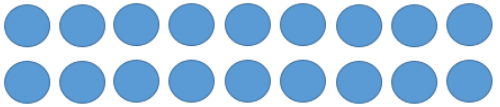
The calculation is the same in both. In the first question we are sharing whereas in the second question we are grouping.

Matilda and Charlie share these apples equally. How many apples do they each get?



There are 50 apples in total so Matilda and Charlie will get 25 apples each.

Share 18 counters in two equal groups.



Take another 18 counters and put them in groups of 2

What's the same?

What's different?

Possible answer: When we share we get 9 counters in each group, and when we group we get 9 groups of 2

Odd & Even Numbers

Notes and Guidance

Building on from Year 1, children should be able to recognise odd and even numbers.

They will use concrete manipulatives to understand odd and even numbers and the structure of these.

Mathematical Talk

Can you sort these objects (number pieces, ten frames, cubes, pictures etc) into odd and even?

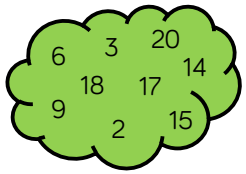
What makes these odd/even?

Which of these numbers can you share equally between 2?

How do you find out if X is an odd or even number?

Varied Fluency

1 Which of the numbers below can be shared equally between 2?
Are the numbers odd or even? Show this in the table.

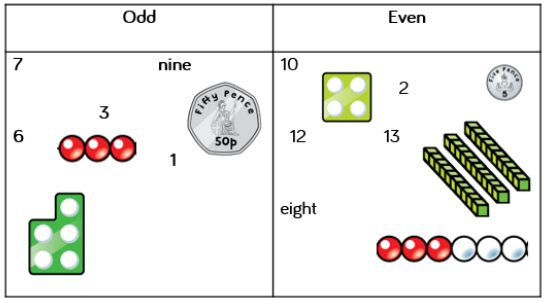


Odd	Even

___ numbers can be shared between 2 equally.
___ numbers cannot be shared between 2 equally.

2 Which pieces are odd? Explain why. Find or draw another piece.

3 Spot the mistakes.



Odd & Even Numbers

Reasoning and Problem Solving

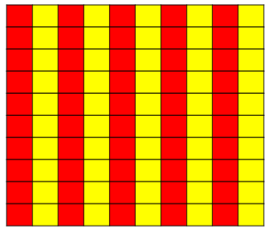
True or false?

12 is an odd number.

Prove it.

Children can use concrete or pictorial methods to show 12 is divisible by 2 and therefore it's false.

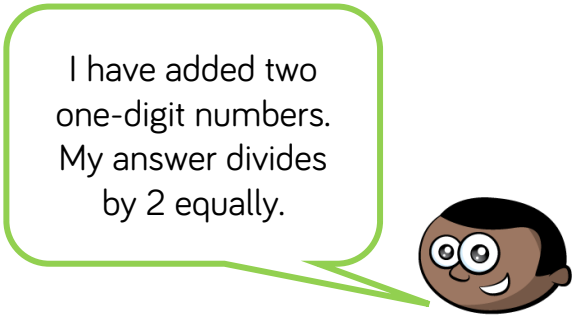
Bob is counting on the 100 square. Instead of saying the numbers he counts "red, yellow, red, yellow"



What could the red numbers be? Why?

What could the yellow numbers be? Why?

The red numbers are odd numbers and the yellow numbers are even.



What could Jermaine's number be? Explain your answer.

Is this the only possible answer?

Any two even one digit numbers or any two odd one digit numbers will give an even total. E.g. 1 + 3 = 4

Divide by 5

Notes and Guidance

During this step, children focus on efficient strategies and whether they should use grouping or sharing.

They use their knowledge of the five times table to help them divide by 5

They will continue to see the '=' sign at both ends of the calculation.

Mathematical Talk

How can we show the problem using objects/images?

How does knowing your 5 times table help when dividing by 5?

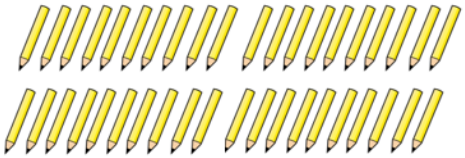
Circle all the multiples of 5 on a 100 square. What do you notice about the numbers? Can you explain the pattern? How does this help you to divide these numbers?

When would we count in 5s?

Varied Fluency

1 Take 20 cubes.
How many towers of 5 can you make?
You can make ___ towers of 5
___ towers of 5 is the same as 20
20 is the same as ___ towers of 5

2 40 pencils are shared between 5 children.



□ ÷ □ = □

How many pencils does each child get?

3 Group the 1 p coins into 5s.
How many 5 p coins do we need to make 20 p?

Draw coins and complete the missing information.

- ___ lots of 5 p = 20 one pence coins
- ___ lots of 5 p = 20 p
- 20 p = ___ × 5 p
- 20 p ÷ 5 p = ___

Divide by 5

Reasoning and Problem Solving

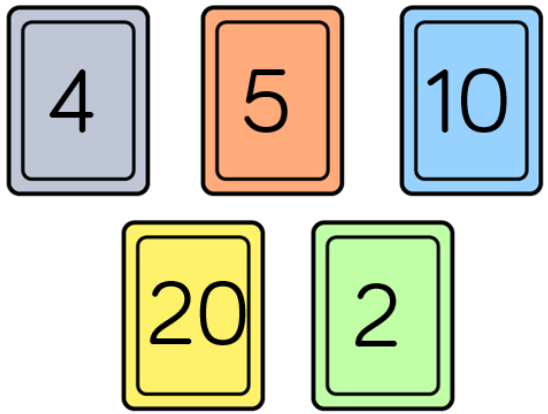
Sam has less than 50 sweets to share into his party bags.

If he puts 5 sweets into each bag and has 3 left over at the end, how many sweets did he have at the start?

Sam could have 48, 43, 38, 33, 28, 23, 18, 13 or 8 sweets.

Use the number cards to make multiplication and division sentences.

How many can you make?



$4 \times 5 = 20$
$5 \times 4 = 20$
$20 \div 4 = 5$
$20 \div 5 = 4$
$5 \times 2 = 10$
$2 \times 5 = 10$
$10 \div 2 = 5$
$10 \div 5 = 2$

Divide by 10

Notes and Guidance

Children will need to be able to multiply by 10 and recognise multiples of 10. They will need to use both grouping and sharing to divide by 10

Children start to see that grouping and counting in 10s is more efficient than sharing into 10 equal groups.

Mathematical Talk

What can we use to represent the apples?

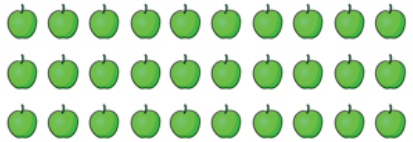
How does knowing your 10 times table help you to divide by 10?

Circle all multiples of 10 on a hundreds square. What do you notice? Can you explain the pattern?

How many groups of 10 are there in ___ tens?

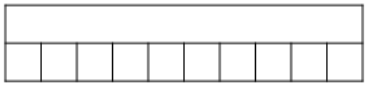
Varied Fluency

1 Apples can be sold in packs of 10
How many packs can be made below?



□ ÷ □ = □

When 30 apples are sold in packs of 10, ___ packs of apples can be made.
Can you show this in a bar model?



2 I have 70 p in my pocket in 10 p coins. How many coins do I have? Draw a picture to prove your answer.

3 Fill in the missing numbers.

- 70 ÷ 10 = □
- 6 tens ÷ 1 ten = □
- 5 = □ ÷ 10
- There are □ tens in 40

Divide by 10

Reasoning and Problem Solving

Mrs Owen has 80 sweets.

She shares them between 10 tables.

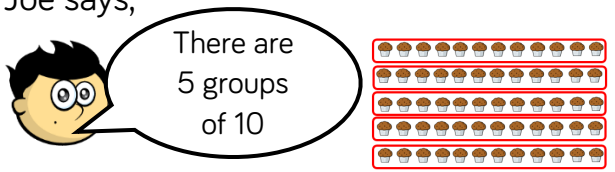
Which calculation describes the word problem?

- 80 ÷ 10
- 80 – 10 – 10 – 10 – 10 – 10 – 10 – 10 – 10 – 10
- 80 – 10

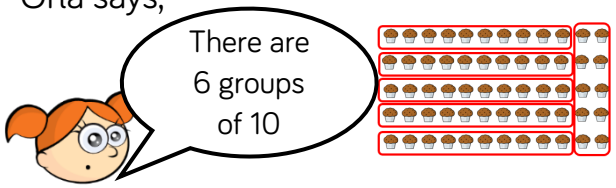
The first one describes the calculation. The second shows 80 subtract 80 and the third shows 80 subtract 10

Cakes are sold in boxes of 10
Joe and Orla are trying to pack the following amount of cakes into boxes.

Joe says,



Orla says,



Who is correct? Explain how you know.

Orla is correct because there are 60 cakes and 60 divided by 10 is 6

Joe has incorrectly grouped the cakes, he might have counted the rows wrong. He hasn't put them in 10s