

Spring Scheme of Learning

Year 3/4

#MathsEveryoneCan

2019-20



How to use the mixed-age SOL

In this document, you will find suggestions of how you may structure a progression in learning for a mixed-age class.

Firstly, we have created a yearly overview.

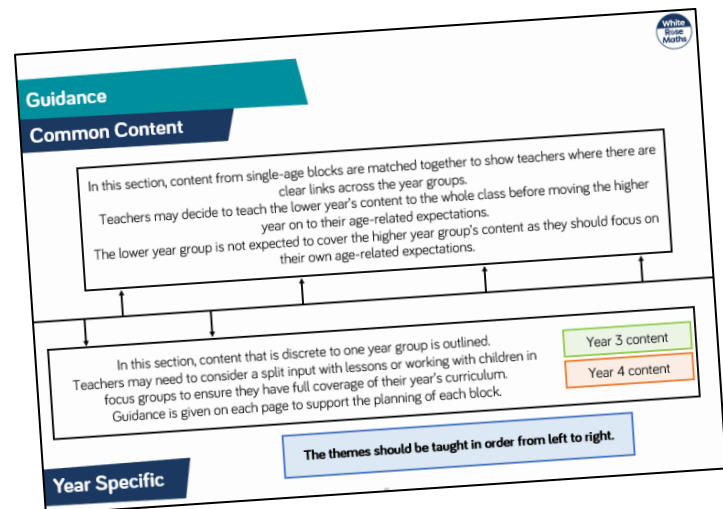
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value				Number: Addition and Subtraction				Number: Multiplication and Division			
Spring	Number: Multiplication and Division	Measurement: Length, Perimeter and Area		Number: Fractions				Y3: Measurement: Mass and Capacity		Consolidation		
								Y4: Number: Decimals				
Summer	Number: Decimals (including Money)			Measurement: Time		Statistics		Geometry: Properties of Shape (including Y4 Position and Direction)			Consolidation	

Each term has 12 weeks of learning. We are aware that some terms are longer and shorter than others, so teachers may adapt the overview to fit their term dates.

The overview shows how the content has been matched up over the year to support teachers in teaching similar concepts to both year groups. Where this is not possible, it is clearly indicated on the overview with 2 separate blocks.

For each block of learning, we have grouped the small steps into themes that have similar content. Within these themes, we list the corresponding small steps from one or both year groups. Teachers can then use the single-age schemes to access the guidance on each small step listed within each theme.

The themes are organised into common content (above the line) and year specific content (below the line). Moving from left to right, the arrows on the line suggest the order to teach the themes.



How to use the mixed-age SOL

Here is an example of one of the themes from the Year 1/2 mixed-age guidance.

Subtraction

Year 1 (Aut B2, Spr B1)

- How many left? (1)
- How many left? (2)
- Counting back
- Subtraction - not crossing 10
- Subtraction - crossing 10 (1)
- Subtraction - crossing 10 (2)

Year 2 (Aut B2, B3)

- Subtract 1-digit from 2-digits
- Subtract with 2-digits (1)
- Subtract with 2-digits (2)
- Find change - money

In order to create a more coherent journey for mixed-age classes, we have re-ordered some of the single-age steps and combined some blocks of learning e.g. Money is covered within Addition and Subtraction.

The bullet points are the names of the small steps from the single-age SOL. We have referenced where the steps are from at the top of each theme e.g. Aut B2 means Autumn term, Block 2. Teachers will need to access both of the single-age SOLs from our website together with this mixed-age guidance in order to plan their learning.

Points to consider

- Use the mixed-age schemes to see where similar skills from both year groups can be taught together. Learning can then be differentiated through the questions on the single-age small steps so both year groups are focusing on their year group content.
- When there is year group specific content, consider teaching in split inputs to classes. This will depend on support in class and may need to be done through focus groups .
- On each of the block overview pages, we have described the key learning in each block and have given suggestions as to how the themes could be approached for each year group.
- We are fully aware that every class is different and the logistics of mixed-age classes can be tricky. We hope that our mixed-age SOL can help teachers to start to draw learning together.

	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				Number: Multiplication and Division			
Spring	Number: Multiplication and Division	Measurement: Length, Perimeter and Area		Number: Fractions				Y3: Measurement: Mass and Capacity		Consolidation		
								Y4: Number: Decimals				
Summer	Number: Decimals (including Money)		Measurement: Time		Statistics		Geometry: Properties of Shape (including Y4 Position and Direction)			Consolidation		

Guidance

Common Content

In this section, content from single-age blocks are matched together to show teachers where there are clear links across the year groups.

Teachers may decide to teach the lower year's content to the whole class before moving the higher year on to their age-related expectations.

The lower year group is not expected to cover the higher year group's content as they should focus on their own age-related expectations.

In this section, content that is discrete to one year group is outlined.
Teachers may need to consider a split input with lessons or working with children in focus groups to ensure they have full coverage of their year's curriculum.
Guidance is given on each page to support the planning of each block.

Year 3 content

Year 4 content

The themes should be taught in order from left to right.

Year Specific

Multiplication and Division

Common Content

Multiplication
Year 3 (Spr B1)

- Multiply 2-digits by 1-digit (1)
- Multiply 2-digits by 1-digit (2)

Year 4 (Spr B1)

- Written methods
- Multiply 2-digits by 1-digit
- Multiply 3-digits by 1-digit

Division
Year 3 (Spr B1)

- Divide 2-digits by 1-digit (1)
- Divide 2-digits by 1-digit (2)
- Divide 2-digits by 1-digit (3)

Year 4 (Spr B1)

- Divide 2-digits by 1-digit (1)
- Divide 2-digits by 1-digit (2)
- Divide 3-digits by 1-digit

Correspondence
Year 3 (Spr B1)

- How many ways?

Year 4 (Spr B1)

- Correspondence problems

In this block, both year groups look at more formal methods of multiplication and division. They are supported in their understanding through the use of concrete manipulatives.

Teachers may decide to introduce scaling to both year groups to reinforce the use of the bar model and apply their understanding of multiplication and division.

Scaling
Year 3 (Spr B1)

- Scaling

Year Specific



Block 1 – Multiplication and
Division

Theme 1 – Multiplication

Multiply 2-digits by 1-digit (1)

Notes and Guidance

Children use their understanding of repeated addition to represent a two-digit number multiplied by a one-digit number with concrete manipulatives. They use the formal method of column multiplication alongside the concrete representation. They also apply their understanding of partitioning to represent and solve calculations.

In this step, children explore multiplication with no exchange.

Mathematical Talk

How does multiplication link to addition?

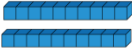
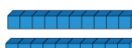
How does partitioning help you to multiply 2-digits by a 1-digit number?

How does the written method match the concrete representation?

Varied Fluency

- There are 21 coloured balls on a snooker table.
How many coloured balls are there on 3 snooker tables?

Use Base 10 to calculate:
 21×4 and 33×3

Tens	Ones
	
	
	

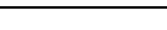
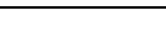
- Complete the calculations to match the place value counters.

Tens	Ones
	
	
	
	

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

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

- Annie uses place value counters to work out 34×2

Tens	Ones
	
	

	T	O
	3	4
$\times$		2
	6	8

Use Annie's method to solve:

$$23 \times 3$$

$$32 \times 3$$

$$42 \times 2$$

Multiply 2-digits by 1-digit (1)

Reasoning and Problem Solving

Alex completes the calculation:

$$43 \times 2$$

Can you spot her mistake?

	T	O
	4	3
×		2
		6
+		8
		14

Alex has multiplied 4 by 2 rather than 40 by 2

Teddy completes the same calculation as Alex.

Can you spot and explain his mistake?

	T	O
	4	3
×		2
8	0	6

Teddy has written 80 where he should have just put an 8 because he is multiplying 4 tens by 2 which is 8 tens. The answer should be 86

Dexter says,



$$4 \times 21 = 2 \times 42$$

Is Dexter correct?

True. Both multiplications are equal to 84

Children may explore that one number has halved and the other has doubled.

Multiply 2-digits by 1-digit (2)

Notes and Guidance

Children continue to use their understanding of repeated addition to represent a two-digit number multiplied by a one-digit number with concrete manipulatives. They move on to explore multiplication with exchange. Each question in this step builds in difficulty.

Mathematical Talk

What happens when we have ten or more ones in a column?
What happens when we have twenty or more ones in a column?

How do we record our exchange?

Do you prefer Jack's method or Amir's method?
Can you use either method for all the calculations?

Varied Fluency



Jack uses Base 10 to calculate 24×4

Tens	Ones

	T	O
	2	4
$\times$		4
	9	6
	1	

Use Jack's method to solve:

$$13 \times 4$$

$$23 \times 4$$

$$26 \times 3$$



Amir uses place value counters to calculate 16×4

Tens	Ones

	T	O
	1	6
$\times$		4
	6	4
	2	

Use Amir's method to solve:

$$16 \times 6$$

$$17 \times 5$$

$$28 \times 3$$



Amir then calculates 5×34

Hundreds	Tens	Ones

	T	O
	3	4
$\times$		5
	1	7
	1	2

Use Amir's method to solve:

$$36 \times 6$$

$$48 \times 4$$

Multiply 2-digits by 1-digit (2)

Reasoning and Problem Solving

Always, Sometimes, Never?

A two-digit number multiplied by a one-digit number has a two-digit product.

Sometimes.

e.g.

$$13 \times 5 = 65$$

$$31 \times 5 = 155$$

Explain the mistake.

H	T	O
	2	7
×		3
6	2	1

They have not performed the exchange correctly. 6 tens and 2 tens should be added together to make 8 tens so the correct answer is 81

How close can you get to 100?
Use each digit card once in the multiplication.

2 3 4

□ □ × □ =

You can get within 8 of 100

$23 \times 4 = 92$ this is the closest answer.

$$24 \times 3 = 72$$

$$32 \times 4 = 128$$

$$34 \times 2 = 68$$

Written Methods

Notes and Guidance

Children use a variety of informal written methods to multiply a two-digit and a one-digit number.

It is important to emphasise when it would be more efficient to use a mental method to multiply and when we need to represent our thinking by showing working.

Mathematical Talk

Why are there not 26 jumps of 8 on the number line?

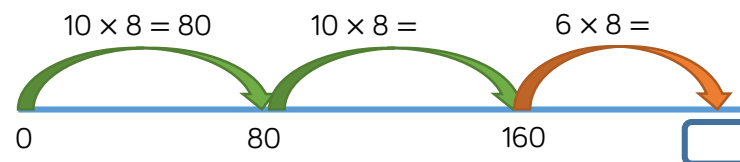
Could you find a more efficient method?

Can you calculate the multiplication mentally or do you need to write down your method?

Can you partition your number into more than two parts?

Varied Fluency

- There are 8 classes in a school.
Each class has 26 children.
How many children are there altogether?
Complete the number line to solve the problem.

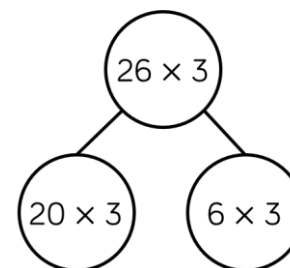


Use this method to work out the multiplications.

$$16 \times 7 \quad 34 \times 6 \quad 27 \times 4$$

- Rosie uses Base 10 and a part-whole model to calculate 26×3 .
Complete Rosie's calculations.

Tens	Ones



Use Rosie's
method to work

out:

$$36 \times 3$$

$$24 \times 6$$

$$45 \times 4$$

Written Methods

Reasoning and Problem Solving

Here are 6 multiplications.

$$43 \times 5$$

$$54 \times 6$$

$$38 \times 6$$

$$33 \times 2$$

$$19 \times 7$$

$$84 \times 5$$

Which of the multiplications would you calculate mentally?

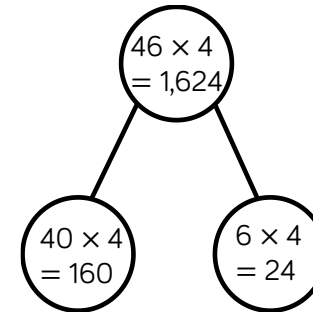
Which of the multiplications would you use a written method for?

Explain your choices to a partner.
Did your partner choose the same methods as you?

Children will sort the multiplications in different ways.

It is important that teachers discuss why they have made the choices and refer back to the efficient multiplication step to remind children of efficient ways to multiply mentally.

Ron is calculating 46 multiplied by 4 using the part-whole model.



Can you explain Ron's mistake?

Ron has multiplied the parts correctly, but added them up incorrectly.
 $160 + 24 = 184$

Multiply 2-digits by 1-digit

Reasoning and Problem Solving

Here are three incorrect multiplications.

	T	O
	6	1
×		5
	3	5

	T	O
	7	4
×		7
4	9	8

	T	O
	2	6
×		4
8	2	4

Correct the multiplications.

	T	O
	6	1
×		5
3	0	5
3		

	T	O
	7	4
×		7
5	1	8
2		

	T	O
	2	6
×		4
1	0	4
2		

Always, sometimes, never

- When multiplying a two-digit number by a one-digit number, the product has 3 digits.
- When multiplying a two-digit number by 8 the product is odd.
- When multiplying a two-digit number by 7 you need to exchange.

Prove it.

Sometimes: 12×2 has only two-digits; 23×5 has three digits.

Never: all multiples of 8 are even.

Sometimes: most two-digit numbers need exchanging, but not 10 or 11

Multiply 3-digits by 1-digit

Notes and Guidance

Children build on previous steps to represent a three-digit number multiplied by a one-digit number with concrete manipulatives.

Teachers should be aware of misconceptions arising from 0 in the tens or ones column.

Children continue to exchange groups of ten ones for tens and record this in a written method.

Mathematical Talk

How is multiplying a three-digit number by one-digit similar to multiplying a two-digit number by one-digit?

Would you use counters to represent 84 multiplied by 8? Why?

Varied Fluency

Complete the calculation.

Hundreds	Tens	Ones
100 100		1 1 1
100 100		1 1 1
100 100		1 1 1

	H	T	O
	2	0	3
x			3

A school has 4 house teams.
There are 245 children in each house team.
How many children are there altogether?

Hundreds	Tens	Ones
100 100	10 10 10 10	1 1 1 1 1
100 100	10 10 10 10	1 1 1 1 1
100 100	10 10 10 10	1 1 1 1 1
100 100	10 10 10 10	1 1 1 1 1

	H	T	O
	2	4	5
x			4

Write the multiplication represented by the counters and calculate the answer using the formal written method.

Hundreds	Tens	Ones
100 100 100	10 10 10 10 10 10 10 10	
100 100 100	10 10 10 10 10 10 10 10	

Multiply 3-digits by 1-digit

Reasoning and Problem Solving

Spot the mistake

Alex and Dexter have both completed the same multiplication.



Alex

	H	T	O
	2	3	4
×			6
1	2	0	4
	2	2	

Who has the correct answer?

What mistake has been made by one of the children?



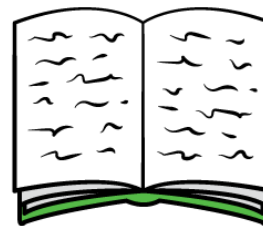
Dexter

	H	T	O
	2	3	4
×			6
1	4	0	4
	2	2	

Dexter has the correct answer.

Alex has forgotten to add the two hundreds she exchanged from the tens column.

Teddy and his mum were having a reading competition.
In one month, Teddy read 814 pages.



His mum read 4 times as many pages as Teddy.

How many pages did they read altogether?

How many fewer pages did Teddy read? Use the bar model to help.

Teddy 814

Mum 814 814 814 814

$$814 \times 5 = 4,070$$

They read 4,070 pages altogether.

$$814 \times 3 = 2,442$$

Teddy read 2,442 fewer pages than his mum.



Block 1 – Multiplication and
Division

Theme 2 - Division

Divide 2-digits by 1-digit (1)

Notes and Guidance

Children divide 2-digit numbers by a 1-digit number by partitioning into tens and ones and sharing into equal groups.

They divide numbers that do not involve exchange or remainders.

It is important that children divide the tens first and then the ones.

Mathematical Talk

How can we partition the number?

How many tens are there?

How many ones are there?

What could we use to represent this number?

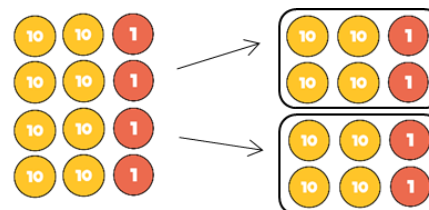
How many equal groups do I need?

How many rows will my place value chart have?

How does this link to the number I am dividing by?

Varied Fluency

Ron uses place value counters to solve $84 \div 2$



I made 84 using place value counters and divided them between 2 equal groups.



Use Ron's method to calculate:

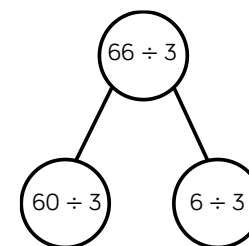
$$84 \div 4$$

$$66 \div 2$$

$$66 \div 3$$

Eva uses a place value grid and part-whole model to solve $66 \div 3$

Tens	Ones
10 10	1 1
10 10	1 1
10 10	1 1



Use Eva's method to calculate:

$$69 \div 3$$

$$96 \div 3$$

$$86 \div 2$$

Divide 2-digits by 1-digit (1)

Reasoning and Problem Solving

Teddy answers the question $44 \div 4$ using place value counters.



Tens	Ones
10 10	1 1
10 10	1 1

Is he correct?
Explain your reasoning.

 Dora thinks that 88 sweets can be shared equally between eight people.

Is she correct?

Teddy is incorrect. He has divided 44 by 2 instead of by 4

Dora is correct because 88 divided by 8 is equal to 11

T	O
10	1
10	1
10	1
10	1
10	1
10	1
10	1
10	1

Alex uses place value counters to help her calculate $63 \div 3$



Tens	Ones
10 10 1	10 1
10 10 1	10 1
10 10 1	10 1

Tens	Ones
10	10 1
10	10 1
10	10 1

She gets an answer of 12
Is she correct?

Alex is incorrect because she has not placed counters in the correct columns.

It should look like this:

Tens	Ones
10 10	1
10 10	1
10 10	1

The correct answer is 21

Divide 2-digits by 1-digit (2)

Notes and Guidance

Children divide 2-digit numbers by a 1-digit number by partitioning into tens and ones and sharing into equal groups.

They divide numbers that involve exchanging between the tens and ones. The answers do not have remainders.

Children use their times-tables to partition the number into multiples of the divisor.

Mathematical Talk

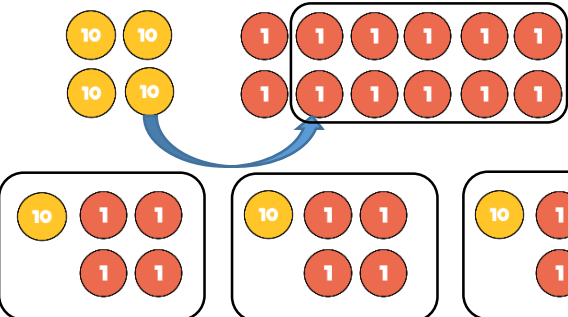
Why have we partitioned 42 into 30 and 12 instead of 40 and 2?

What do you notice about the partitioned numbers and the divisor?

Why do we partition 96 in different ways depending on the divisor?

Varied Fluency

Ron uses place value counters to divide 42 into three equal groups.



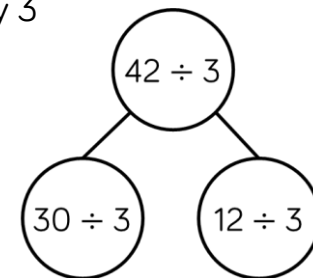
He shares the tens first and exchanges the remaining ten for ones.

Then he shares the ones.
 $42 \div 3 = 14$

Use Ron's method to calculate $48 \div 3$, $52 \div 4$ and $92 \div 8$

Annie uses a similar method to divide 42 by 3

Tens	Ones
10	1 1 1 1
10	1 1 1 1
10	1 1 1 1



Use Annie's method to calculate:

$96 \div 8$

$96 \div 4$

$96 \div 3$

$96 \div 6$

Divide 2-digits by 1-digit (2)

Reasoning and Problem Solving

Compare the statements using $<$, $>$ or $=$

$$48 \div 4 \bigcirc 36 \div 3$$

$=$

$$52 \div 4 \bigcirc 42 \div 3$$

$<$

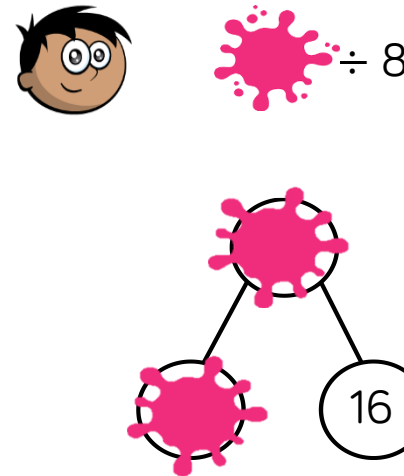
$$60 \div 3 \bigcirc 60 \div 4$$

$>$

Amir partitioned a number to help him divide by 8

Some of his working out has been covered with paint.

What number could Amir have started with?



The answer could be 56 or 96

Divide 2-digits by 1-digit (3)

Notes and Guidance

Children move onto solving division problems with a remainder.

Links are made between division and repeated subtraction, which builds on learning in Year 2

Children record the remainders as shown in Tommy's method. This notation is new to Year 3 so will need a clear explanation.

Mathematical Talk

- How do we know 13 divided by 4 will have a remainder?
- Can a remainder ever be more than the divisor?
- Which is your favourite method?
- Which methods are most efficient with larger two digit numbers?

Varied Fluency

How many squares can you make with 13 lollipop sticks?

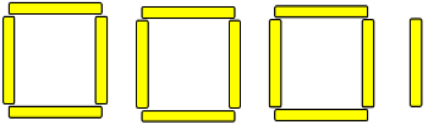
There are ___ lollipop sticks.

There are ___ groups of 4

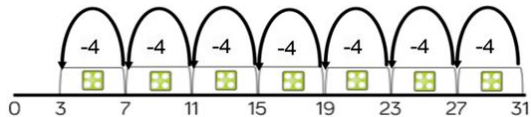
There is ___ lollipop stick remaining.

$13 \div 4 = \text{___ remainder ___}$

Use this method to see how many triangles you can make with 38 lollipop sticks.



Tommy uses repeated subtraction to solve $31 \div 4$



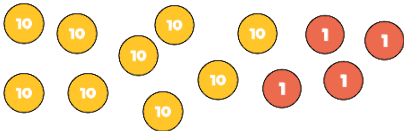
$31 \div 4 = 7 \text{ r } 3$

Use Tommy's method to solve 38 divided by 3

Use place value counters to work out $94 \div 4$

Did you need to exchange any tens for ones?

Is there a remainder?



Tens	Ones

Divide 2-digits by 1-digit (3)

Reasoning and Problem Solving

Which calculation is the odd one out?
Explain your thinking.

$$64 \div 8$$

$$77 \div 4$$

$$49 \div 6$$

$$65 \div 3$$

$64 \div 8$ could be the odd one out as it is the only calculation without a remainder.

Make sure other answers are considered such as $65 \div 3$ because it is the only one being divided by an odd number.

Jack has 15 stickers.



He sorts his stickers into equal groups but has some stickers remaining. How many stickers could be in each group and how many stickers would be remaining?

There are many solutions, encourage a systematic approach.
e.g. 2 groups of 7, remainder 1
3 groups of 4, remainder 3
2 groups of 6, remainder 3

Dora and Eva are planting bulbs. They have 76 bulbs altogether.

Dora plants her bulbs in rows of 8 and has 4 left over.
Eva plants her bulbs in rows of 10 and has 2 left over.

How many bulbs do they each have?

Dora has 44 bulbs.
Eva has 32 bulbs.

Divide 2-digits by 1-digit (1)

Notes and Guidance

Children build on their knowledge of dividing a 2-digit number by a 1-digit number from Year 3 by sharing into equal groups.

Children use examples where the tens and the ones are divisible by the divisor, e.g. 96 divided by 3 and 84 divided by 4. They then move on to calculations where they exchange between tens and ones.

Mathematical Talk

How can we partition 84?

How many rows do we need to share equally between?

If I cannot share the tens equally, what do I need to do?

How many ones will I have after exchanging the tens?

If we know $96 \div 4 = 24$, what will $96 \div 8$ be?

What will $96 \div 2$ be? Can you spot a pattern?

Varied Fluency

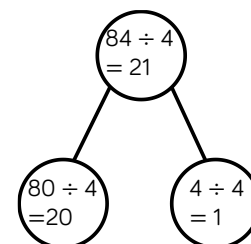
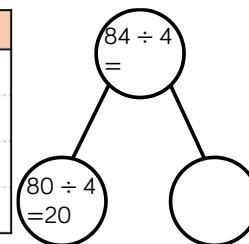
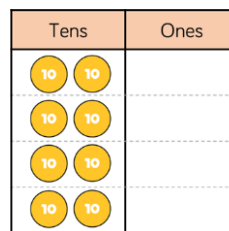


Jack is dividing 84 by 4 using place value counters.



First, he divides the tens.

Then, he divides the ones.



Use Jack's method to calculate:

$$69 \div 3$$

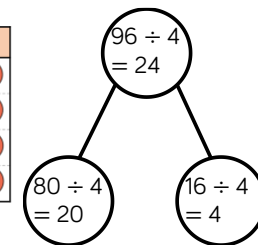
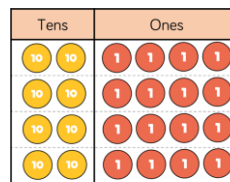
$$88 \div 4$$

$$96 \div 3$$



Rosie is calculating 96 divided by 4 using place value counters.

First, she divides the tens. She has one ten remaining so she exchanges one ten for ten ones. Then, she divides the ones.



Use Rosie's method to solve

$$65 \div 5$$

$$75 \div 5$$

$$84 \div 6$$

Divide 2-digits by 1-digit (1)

Reasoning and Problem Solving

Dora is calculating $72 \div 3$
Before she starts, she says the calculation will involve an exchange.

Do you agree?
Explain why.

Dora is correct because 70 is not a multiple of 3 so when you divide 7 tens between 3 groups there will be one remaining which will be exchanged.

Use $<$, $>$ or $=$ to complete the statements.

$$69 \div 3 \bigcirc 96 \div 3$$

$$96 \div 4 \bigcirc 96 \div 3$$

$$91 \div 7 \bigcirc 84 \div 6$$

 $<$
 $<$
 $<$

Eva has 96 sweets.
She shares them into equal groups.
She has no sweets left over.
How many groups could Eva have shared her sweets into?

Possible answers

$$96 \div 1 = 96$$

$$96 \div 2 = 48$$

$$96 \div 3 = 32$$

$$96 \div 4 = 24$$

$$96 \div 6 = 16$$

$$96 \div 8 = 12$$

Divide 2-digits by 1-digit (2)

Notes and Guidance

Children explore dividing 2-digit numbers by 1-digit numbers involving remainders.

They continue to use the place value counters to divide in order to explore why there are remainders. Teachers should highlight, through questioning, that the remainder can never be greater than the number you are dividing by.

Mathematical Talk

If we are dividing by 3, what is the highest remainder we can have?

If we are dividing by 4, what is the highest remainder we can have?

Can we make a general rule comparing our divisor (the number we are dividing by) to our remainder?

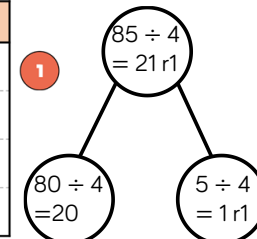
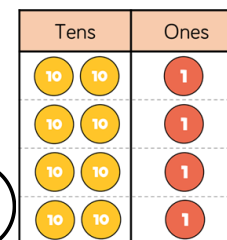
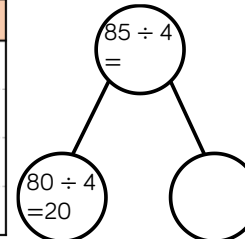
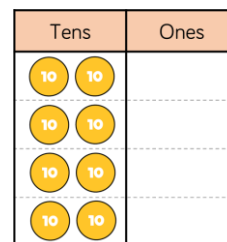
Varied Fluency

Teddy is dividing 85 by 4 using place value counters.



First, he divides the tens.

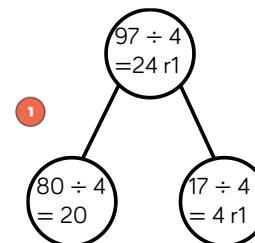
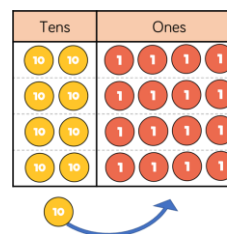
Then, he divides the ones.



Use Teddy's method to calculate:

$$86 \div 4 \quad 87 \div 4 \quad 88 \div 4 \quad 97 \div 3 \quad 98 \div 3 \quad 99 \div 3$$

Whitney uses the same method, but some of her calculations involve an exchange.



Use Whitney's method to solve

$$57 \div 4$$

$$58 \div 4$$

$$58 \div 3$$

Divide 2-digits by 1-digit (2)

Reasoning and Problem Solving

Rosie writes,
 $85 \div 3 = 28 \text{ r } 1$

She says 85 must be 1 away from a multiple of 3
Do you agree?

I agree, remainder 1 means there is 1 left over. 85 is one more than 84 which is a multiple of 3

37 sweets are shared between 4 friends.
How many sweets are left over?

Four children attempt to solve this problem.

- Alex says it's 1
- Mo says it's 9
- Eva says it's 9 r 1
- Jack says it's 8 r 5

Can you explain who is correct and the mistakes other people have made?

Alex is correct as there will be one remaining sweet. Mo has found how many sweets each friend will receive. Eva has written the answer to the calculation. Jack has found a remainder that is larger than the divisor so is incorrect.

Whitney is thinking of a 2-digit number that is less than 50

When it is divided by 2, there is no remainder.

When it is divided by 3, there is a remainder of 1

When it is divided by 5, there is a remainder of 3

What number is Whitney thinking of?

Whitney is thinking of 28

Divide 3-digits by 1-digit

Notes and Guidance

Children apply their previous knowledge of dividing 2-digit numbers to divide a 3-digit number by a 1-digit number.

They use place value counters and part-whole models to support their understanding.

Children divide numbers with and without remainders.

Mathematical Talk

What is the same and what's different when we are dividing 3-digit number by a 1-digit number and a 2-digit number by a 1-digit number?

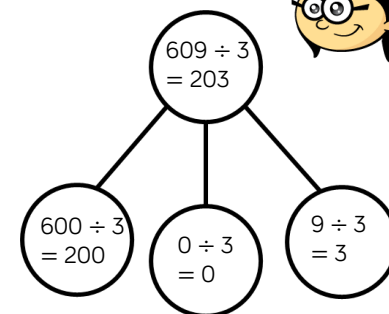
Do we need to partition 609 into three parts or could it just be partitioned into two parts?

Can we partition the number in more than one way to support dividing more efficiently?

Varied Fluency

Annie is dividing 609 by 3 using place value counters.

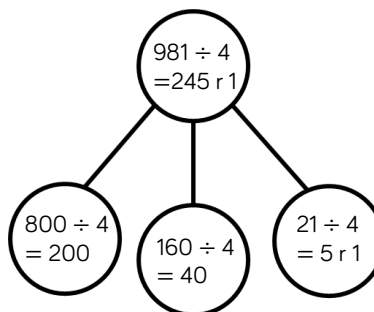
Hundreds	Tens	Ones
100 100		1 1 1
100 100		1 1 1
100 100		1 1 1



Use Annie's method to calculate the divisions.

$$906 \div 3 \quad 884 \div 4 \quad 884 \div 8 \quad 489 \div 2$$

Rosie is using flexible partitioning to divide 3-digit numbers. She uses her place value counters to support her.



Hundreds	Tens	Ones
100 100	10 10 10 10	1 1 1 1 1 1
100 100	10 10 10 10	1 1 1 1 1 1
100 100	10 10 10 10	1 1 1 1 1 1
100 100	10 10 10 10	1 1 1 1 1 1

1

Use Rosie's method to solve:

$$726 \div 6$$

$$846 \div 6$$

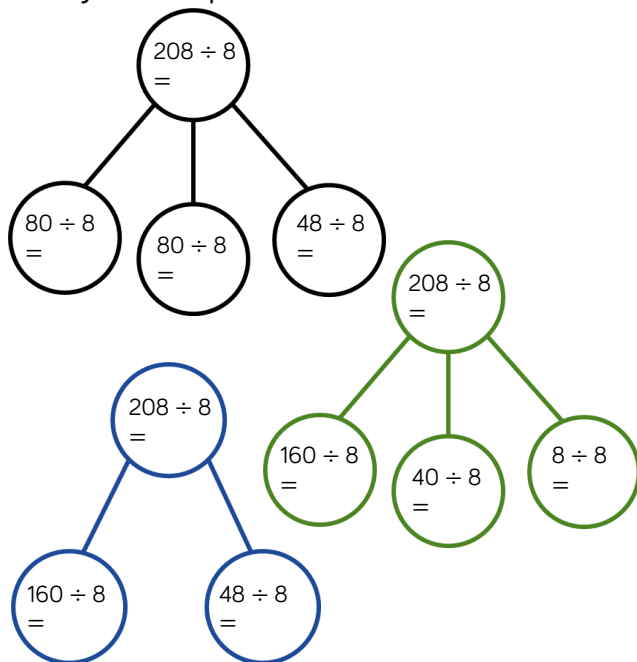
$$846 \div 7$$

Divide 3-digits by 1-digit

Reasoning and Problem Solving

Dexter is calculating $184 \div 8$ using part-whole models.

Can you complete each model?



How many part-whole models can you make to calculate $132 \div 4$?

$$208 \div 8 = 26$$

$$80 \div 8 = 10$$

$$48 \div 8 = 6$$

$$160 \div 8 = 20$$

$$40 \div 8 = 5$$

$$8 \div 8 = 1$$

Children can then make a range of part-whole models to calculate $132 \div 4$

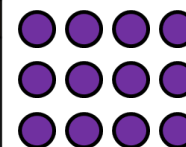
e.g.

$$100 \div 4 = 25$$

$$32 \div 4 = 8$$

You have 12 counters and the place value grid. You must use all 12 counters to complete the following.

Hundreds	Tens	Ones



Create a 3-digit number divisible by 2
 Create a 3-digit number divisible by 3
 Create a 3-digit number divisible by 4
 Create a 3-digit number divisible by 5
 Can you find a 3-digit number divisible by 6, 7, 8 or 9?

2: Any even number

3: Any 3-digit number (as the digits add up to 12, a multiple of 3)

4: A number where the last two digits are a multiple of 4

5: Any number with 0 or 5 in the ones column.

Possible answers

6: Any even number

7: 714, 8: 840

9: impossible



Block 1 – Multiplication and
Division

Theme 3 - Scaling

Scaling

Notes and Guidance

It is important that children are exposed to problems involving scaling from an early age.

Children should be able to answer questions that use the vocabulary “times as many”.

Bar models are particularly useful here to help children visualise the concept. Examples and non-examples should be used to ensure depth of understanding.

Mathematical Talk

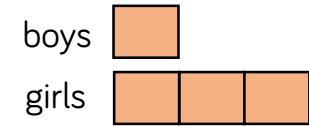
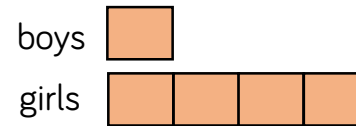
Why might someone draw the first bar model? What have they misunderstood?

What is the value of Amir’s counters? How do you know?

How many adults are at the concert? How will you work out the total?

Varied Fluency

- ✦ In a playground there are 3 times as many girls as boys.



Which bar model represents the number of boys and girls?
Explain your choice.

- ✦ Draw a bar model to represent this situation.

In a car park there are 5 times as many blue cars as red cars.

- ✦ Eva has these counters 

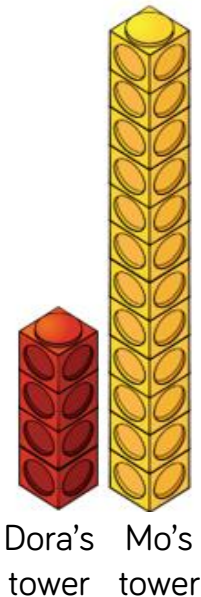
Amir has 4 times as many counters.
How many counters does Amir have?

- ✦ There are 35 children at a concert.
3 times as many adults are at the concert.
How many people are at the concert in total?

Scaling

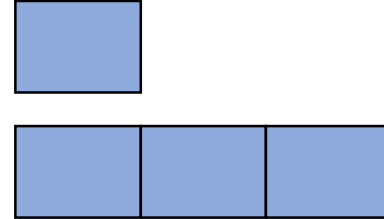
Reasoning and Problem Solving

Dora says Mo's tower is 3 times taller than her tower.
Mo says his tower is 12 times taller than Dora's tower.
Who do you agree with?
Explain why?

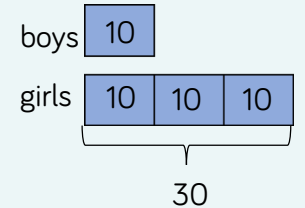


I agree with Dora. Her tower is 4 cubes tall. Mo's tower is 12 cubes tall. 12 is 3 times as big as 4. Mo has just counted his cubes and not compared them to Dora's tower.

In a playground there are 3 times as many girls as boys.
There are 30 girls.
Label and complete the bar model to help you work out how many boys there are in the playground.



There are 10 boys in the playground.



A box contains some counters.
There are twice as many green counters as pink counters.
There are 18 counters in total.
How many pink counters are there?

There are 6 pink counters.

How Many Ways?

Notes and Guidance

Children list systematically the possible combinations resulting from two groups of objects. Encourage the use of practical equipment and ensure that children take a systematic approach to each problem.

Children should be encouraged to calculate the total number of ways without listing all the possibilities. e.g. Each T-shirt can be matched with 4 pairs of trousers so altogether $3 \times 4 = 12$ outfits.

Mathematical Talk

What are the names of the shapes on the shape cards?
How do you know you have found all of the ways?
Would making a table help?

Without listing, can you tell me how many possibilities there would be if there are 5 different shape cards and 4 different number cards?

Varied Fluency

Jack has 3 T-shirts and 4 pairs of trousers. Complete the table to show how many different outfits he can make.



T-shirt	Trousers
Blue	Blue
Blue	Dark blue
Blue	Orange
Blue	Green

Alex has 4 shape cards and 3 number cards.

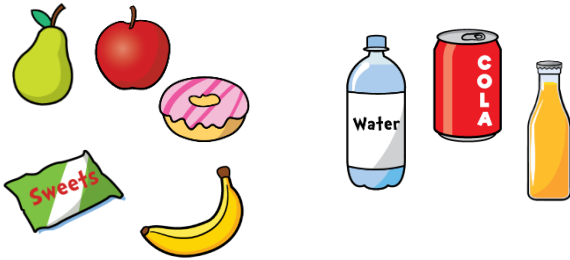


She chooses a shape card and a number card.
List all the possible ways she could do this.

How Many Ways?

Reasoning and Problem Solving

Eva chooses a snack and a drink.



What could she have chosen?
How many different possibilities are there?

____ × ____ = ____

There are ____ possibilities.

How many of the ways contain an apple?

There are 15 possibilities.

AW
AC
AO
PW
PC
PO
SW
SC
SO
DW
DC
DO
BW
BC
BO

3 ways contain an apple.

Jack has some jumpers and pairs of trousers.
He can make 15 different outfits.
How many jumpers could he have and how many pairs of trousers could he have?

He could have:
1 jumper and 15 pairs of trousers.
3 jumpers and 5 pairs of trousers.
15 jumpers and 1 pair of trousers.
5 jumpers and 3 pairs of trousers.

Correspondence Problems

Notes and Guidance

Children solve more complex problems building on their understanding from Year 3 of when n objects relate to m objects.

They find all solutions and notice how to use multiplication facts to solve problems.

Mathematical Talk

Can you use a table to support you to find all the combinations?

Can you use a code to help you find the combinations? e.g. VS meaning Vanilla and Sauce

Can you use coins to support you to make all the possible combinations?

Varied Fluency

- An ice-cream van has 4 flavours of ice-cream and 2 choices of toppings.

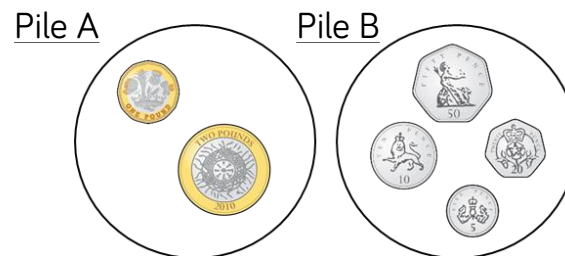
Ice-cream flavour	Toppings
Vanilla	Sauce
Chocolate	Flake
Strawberry	
Banana	

How many different combinations of ice-cream and toppings can be made?

Complete the multiplication to represent the combinations.

___ $\times$ ___ = ___ There are ___ combinations.

- Jack has two piles of coins.
He chooses one coin from each pile.



What are all the possible combinations of coins Jack can choose?
What are all the possible totals he can make?

Correspondence Problems

Reasoning and Problem Solving

Here are the meal choices in the school canteen.

Starter	Main	Dessert
Soup Garlic Bread	Pasta Chicken Beef Salad	Cake Ice-cream Fruit Salad

There are 2 choices of starter, 4 choices of main and 3 choices of dessert.

How many meal combinations can you find? Can you use a systematic approach?

Can you represent the combinations in a multiplication?

If there were 20 meal combinations, how many starters, mains and desserts might there be?

There are 24 meal combinations altogether.

$$2 \times 4 \times 3 = 24$$

20 combinations

$$1 \times 1 \times 20$$

$$1 \times 2 \times 10$$

$$1 \times 4 \times 5$$

$$2 \times 2 \times 5$$

Accept all other variations of these four multiplications e.g. $1 \times 20 \times 1$

Alex has 6 T-shirts and 4 pairs of shorts. Dexter has 12 T-shirts and 2 pairs of shorts.

Who has the most combinations of T-shirts and shorts?

Explain your answer.

Alex and Dexter have the same number of combinations of T-shirts and shorts.