



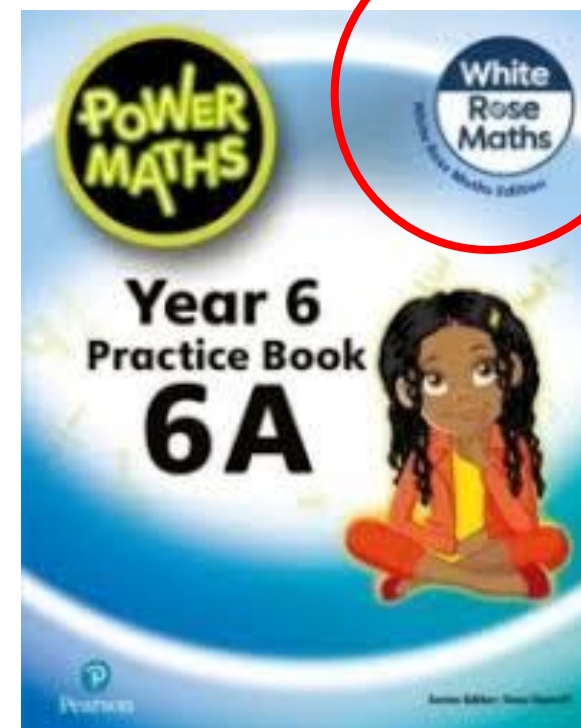
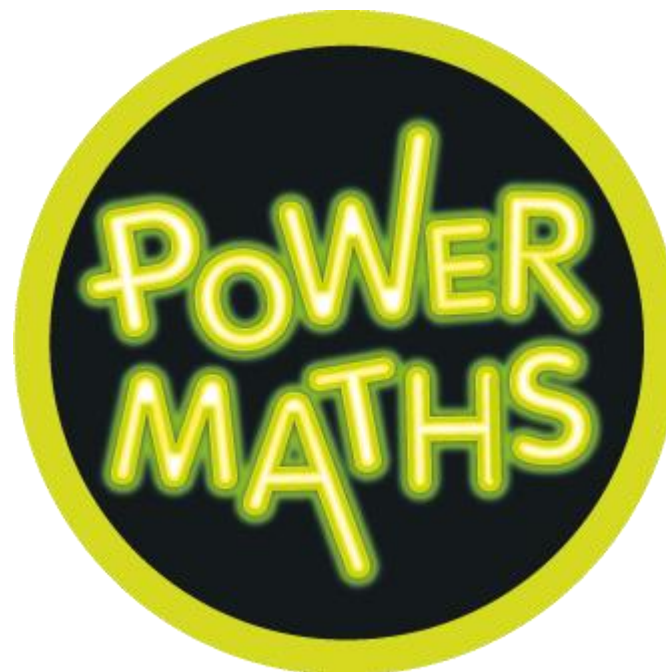
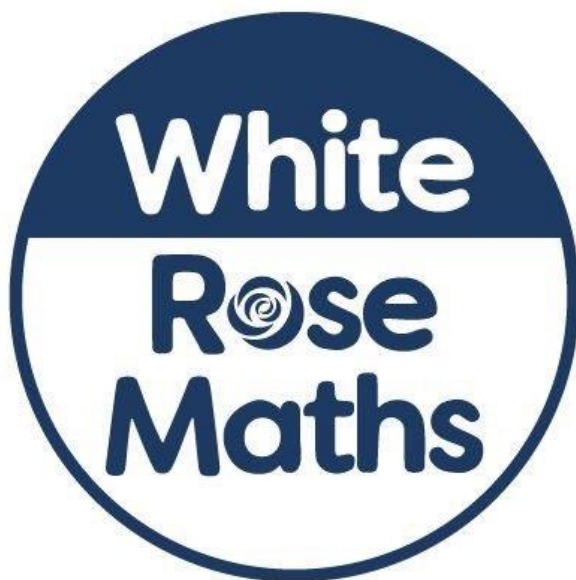
Welcome to our
Maths Workshop for Parents –
Multiplication and Division
31st January 2024
With Miss Scott
and Mr Davies



Aims

- To understand how we teach maths at St Hugh's and why we teach it that way
- To look at progression in calculation strategies for with a particular focus on multiplication and division

White Rose and Power Maths at St Hugh's



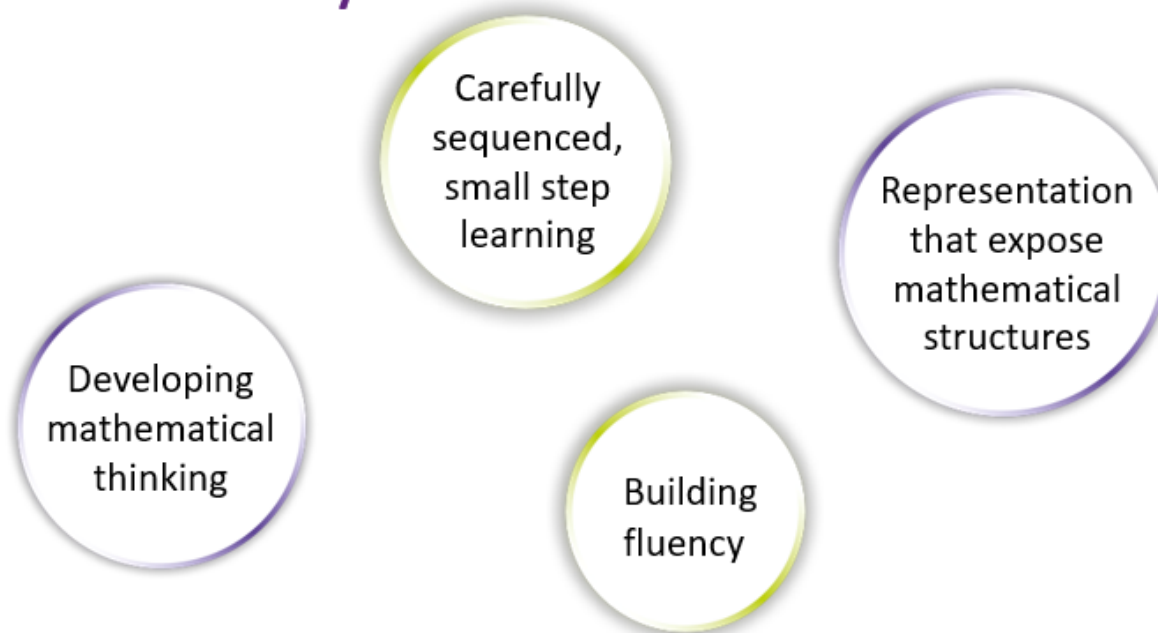


Mastery Approach

What is mastery?

“Mastering maths means acquiring a deep, long-term, secure and adaptable understanding of the subject” – NCETM

We achieve this by ...





Mastery Approach



**At the heart of
Power Maths
is the belief that all
children can achieve.
It's built on an
exciting growth
mindset and
problem-solving
approach.**

Mastery Approach

The *Power Maths* approach

Everyone can!

Founded on the conviction that every child can achieve, *Power Maths* enables children to build number fluency, confidence and understanding, step by step.

Child-centred learning

Children master concepts one step at a time in lessons that embrace a Concrete-Pictorial-Abstract (C-P-A) approach, avoid overload, build on prior learning and help them see patterns and connections. Same-day intervention ensures sustained progress.

Continuing professional development

Embedded teacher support and development offer every teacher the opportunity to continually improve their subject knowledge and manage whole-class teaching for mastery.

Whole-class teaching

An interactive, whole-class teaching model encourages thinking and precise mathematical language and allows children to deepen their understanding as far as they can.





Mastery Approach

Growth mindset

Fixed mindset

"I'm not good at maths – I've never been good at maths"

"I give up – I can't make this any better"

"If I fail I am a failure"

"I can't do this – I keep making mistakes"

Growth mindset

"I'm finding maths hard now, but I can improve with time and effort"

"I can improve if I keep trying"

"Most successful people fail along the way"

"Mistakes help me learn"





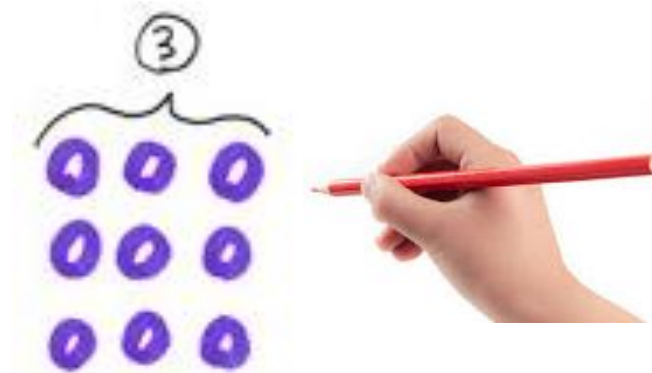
Concrete, Pictorial, Abstract

Concrete: 'doing' the maths- introducing real objects that can be manipulated to bring the problem to life. E.g. money, counters, base 10 equipment etc.

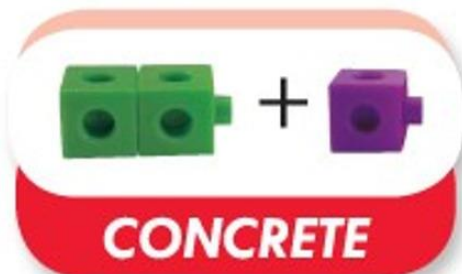
Pictorial: 'seeing the maths'- making connections between the concrete and the pictorial representations and the pictorial and the abstract. Eg: part whole models, bar models, ten frames.

Abstract: the ultimate goal is for children to understand abstract mathematical concepts, signs, symbols and notation. When a child demonstrates with concrete models and pictorial representations that they have grasped a concept, we can be confident that they are ready to explore the abstract.

Progression through concrete, pictorial, abstract to find 3 lots of 3:



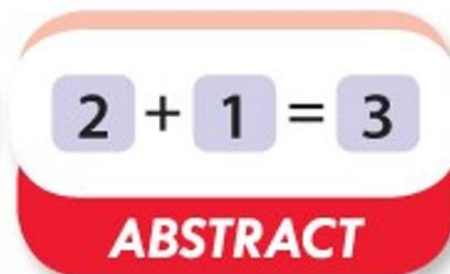
$$3 \times 3 = 9$$



CONCRETE

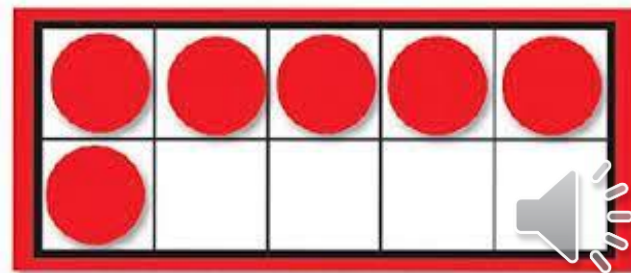


PICTORIAL



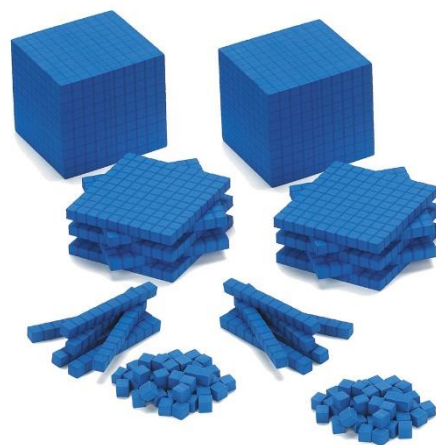
ABSTRACT

Concrete Manipulatives used throughout the school – accessible for all



Blank ThHTO Place Value Chart

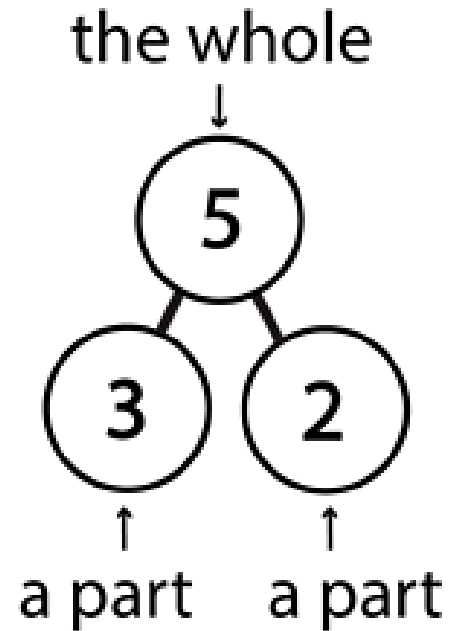
Thousands Th	Hundreds H	Tens T	Ones O



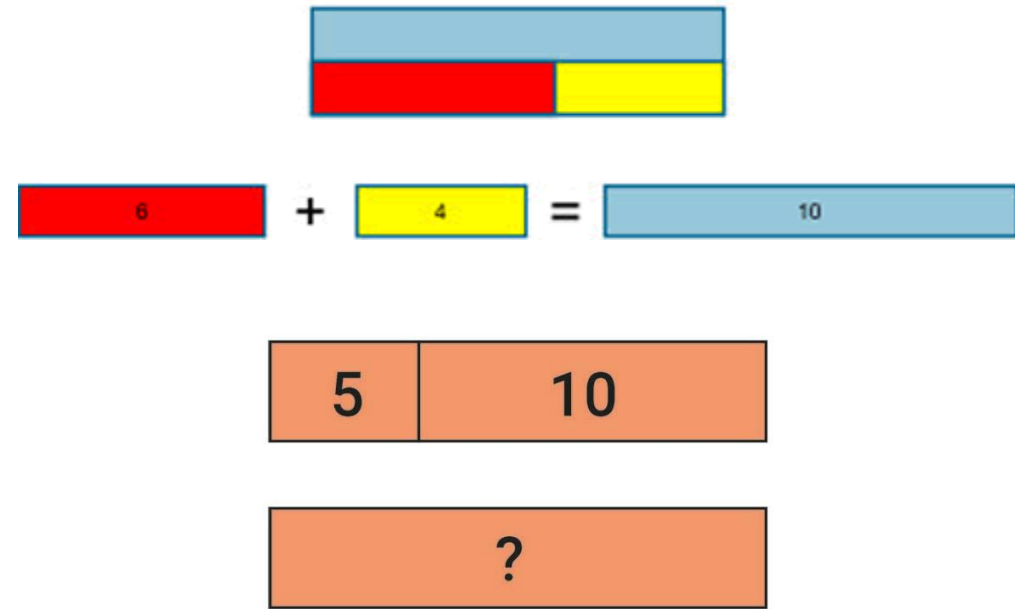


Mathematical Models

Part whole models:

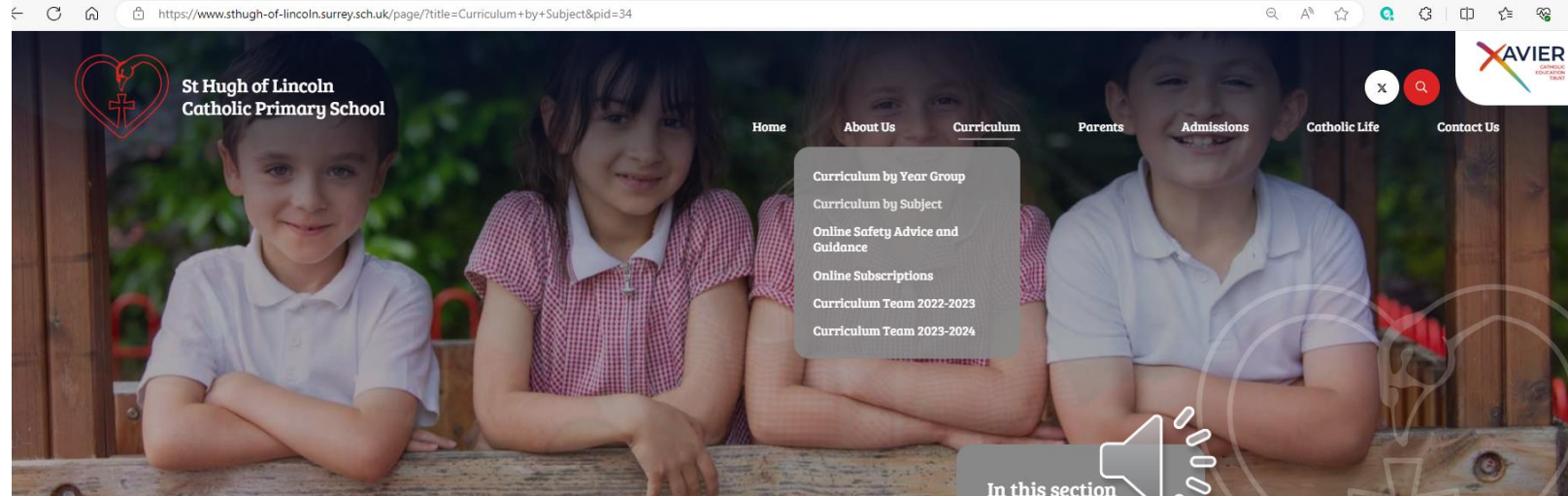


bar models:





Calculation Policy



Home > Curriculum > Curriculum by Subject

Curriculum by Subject

Lesson Study

At St Hugh of Lincoln Catholic Primary we are always working hard to teach our pupils in most exciting and engaging ways. That is why we use a research based tool called Lesson Study. It's just another example of how we go the extra mile to provide the very best education for our children.

What is lesson study?

Lesson Study is a professional development programme that involves teachers working in small groups to plan lessons that address a shared learning goal for pupils. They then deliver these lessons while their peers observe, and refine the lesson plans based on feedback and review. The focus of peer observations is on the learning of particular pupils rather than the teacher.

Why do we do it?

In this section

Religious Education

English

Maths

EYFS

Science

History

Geography

Art & Design

Design & Technology

Home

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Curriculum



KS1 Power Maths White Rose Edition Calculation Policy PDF

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KS2 Power Maths White Rose Edition LKS2 Calculation Policy PDF

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Time Tables

Year 2: 2x, 10x, 5x

Year 3: and 3x, 4x, 8x

Year 4: and 6x, 9x, 7x, 11x, 12x

End of Year 4 – Times Table Assessment



Year 5+6 use and apply all





Explore progression in multiplication and division

Split into groups to see it in action!

Thank you for your time.



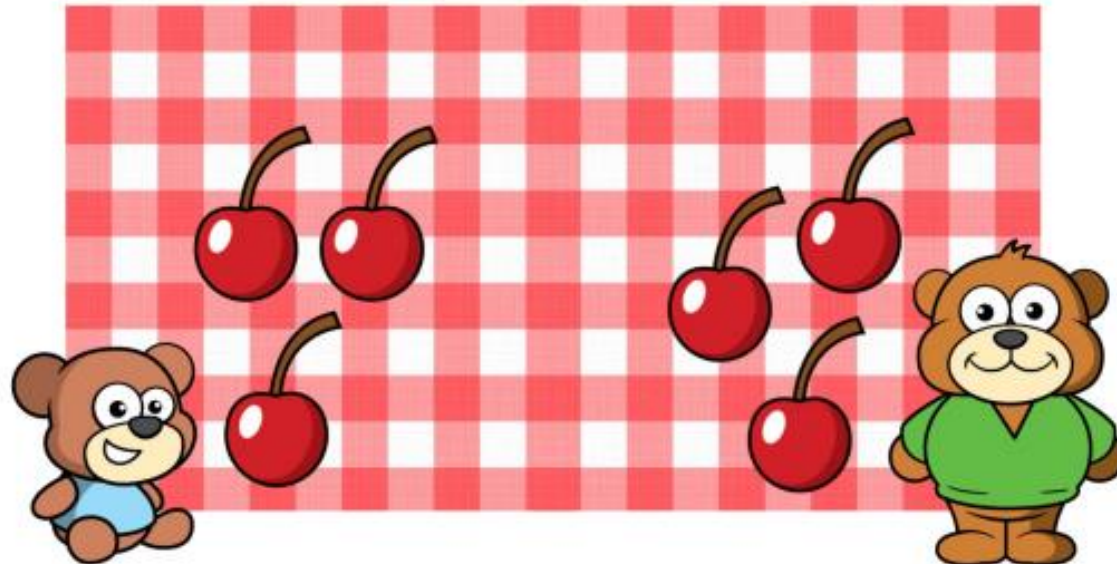


Reception

Have a Teddy Bear Picnic at home.

Share out the snacks equally so that each teddy gets the same.

Check to see if it is fair.



Now share out a different number of snacks.

Can you predict what might happen?

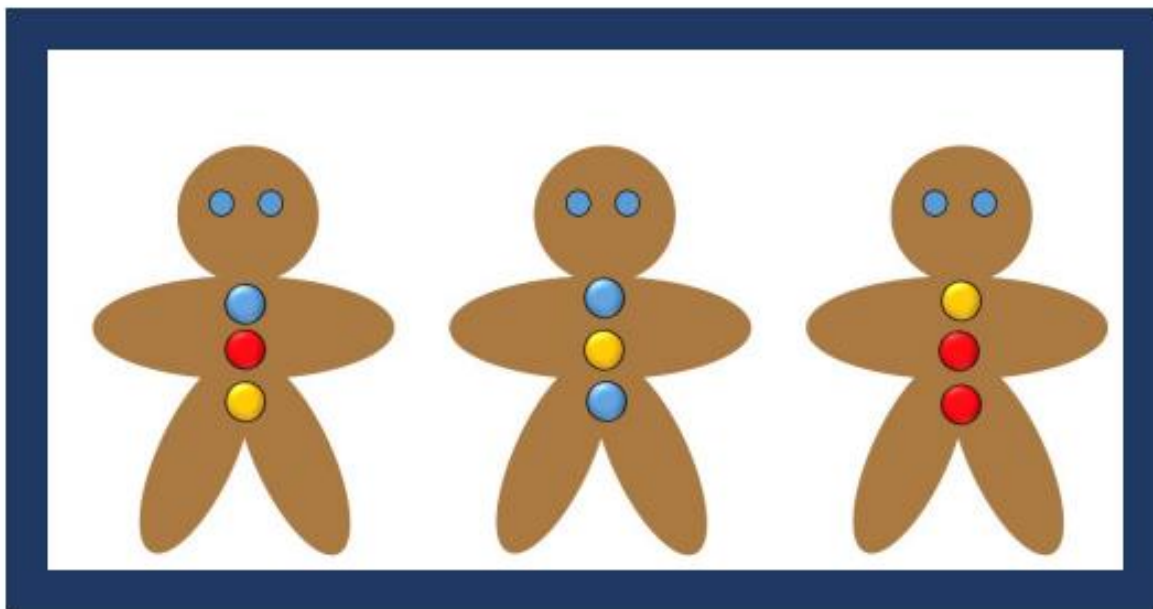


Reception

Make equal groups.

Can you give each gingerbread man 3 buttons?

Then give each of them 4 buttons? What do you notice?



Explore what happens when you change the number of gingerbread men or if you change the number of buttons you give them.



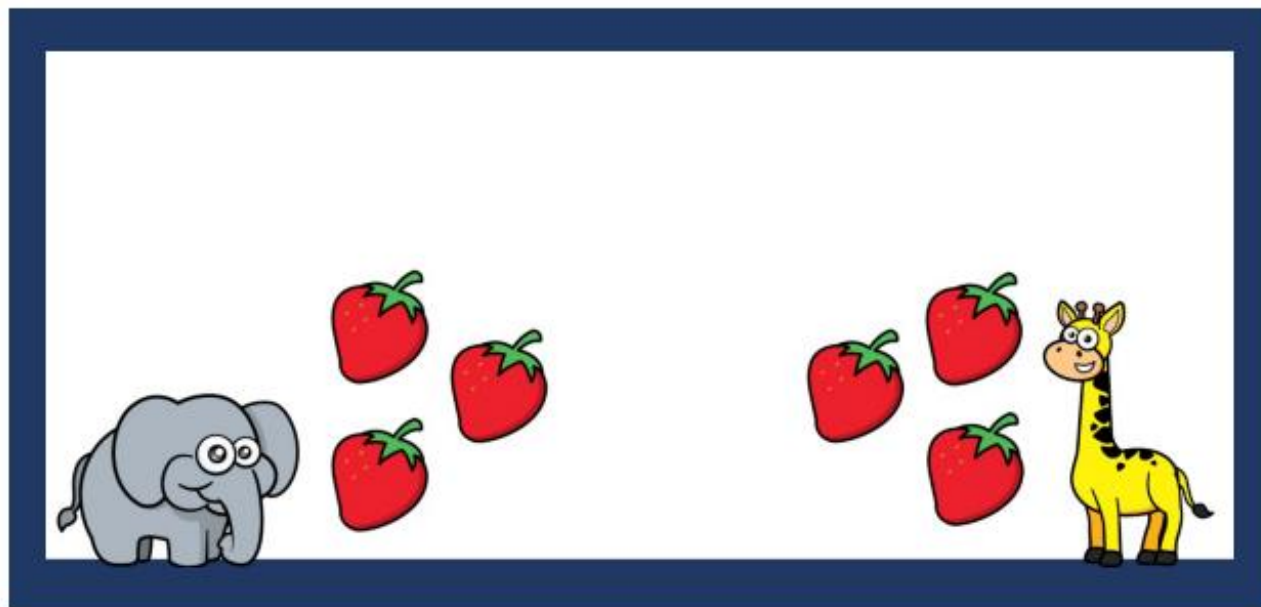
Reception



Share snacks into two groups for you and a friend.

Have you shared into two equal groups?

Is it fair?



Now share out a different number of snacks.

What do you notice?

Year 1

Make arrays

Discover

We have just planted some seeds.



- 1 a) How many seeds are there in each row?
How many rows are there?
How many seeds are there in total?
- b) Make 2 rows of 10 from counters or cubes.

Share

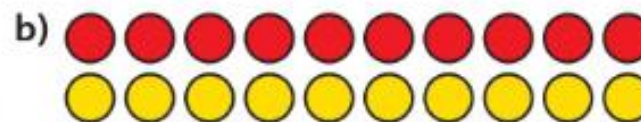


There are 10 seeds in each row.

There are 2 rows.

$$10 + 10 = 20$$

There are 20 seeds in total.



I used different coloured counters to show each row.





Year 1

Sharing

Discover



- 1 a) **Share** 10 strawberries between 2 children.
b) Practise sharing 10 counters between 2.

Share

- a) There are 10 strawberries altogether.



10 shared between 2 is 5 each.

- b)



10 shared between 2 is always 5 each.

Year 2

The x sign

Discover



- Write an addition for the total number of chairs.
- Write a **multiplication** for the total number of chairs.

Share

- a) There are 3 groups of 5 chairs.

To write this as an addition we write $5 + 5 + 5$.

$$5 + 5 + 5 = 15$$



I counted up in 5s to work out the answer.



- b) There are 3 groups of 5 chairs.

To write this as a multiplication, we write 3×5 .

$$3 \times 5 = 15$$

\times means 'multiply'.
One way of thinking about it is 'groups of'.



Year 2

Divide by 2

Discover



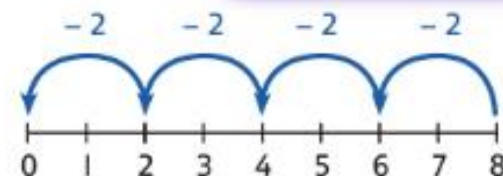
- 1 a) 8 players practise in pairs.
How many groups of 2 are there?
- b) Complete the division.
 $8 \div 2 = \square$

Share

I circled 4 groups of 2 children.



I did repeated subtraction.
You can subtract 2, 4 times.



8 players make 4 pairs.

There are 4 groups of 2.

b) $8 \div 2 = 4$

- There are 8 children.
- There are 2 children in each group.
- The children are put into 4 groups.

$1 \times 2 = 2$
 $2 \times 2 = 4$
 $3 \times 2 = 6$
 $4 \times 2 = 8$
 $5 \times 2 = 10$
 $6 \times 2 = 12$
 $7 \times 2 = 14$
 $8 \times 2 = 16$
 $9 \times 2 = 18$

This is an example of
division by grouping.
We learnt this earlier.

Year 2

Bar modelling – sharing

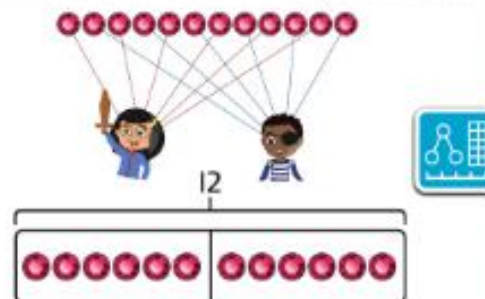
Discover



- 1 a) 2 pirates share 12 .
How many do they get each?
- b) 3 pirates share 15 .
How many do they get each?

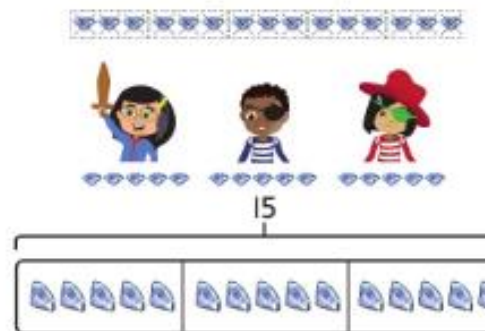
Share

- a) There are 12 and 2 pirates.
You need to share the jewels out.



They get 6 each.
 $12 \div 2 = 6$

- b) There are 15 and 3 pirates.



They get 5 each.
 $15 \div 3 = 5$

There are 12 jewels
and I shared them
out one by one.

I drew a bar model
with 2 parts, because
there are 2 pirates.

I removed a group
of 3 at a time and
gave one to each
pirate. That's still
sharing.

Year 3

Share and group

Discover



Amal

- 1 a) Amal has 20 flowers.
He shares the flowers equally between the 5 vases.
How many flowers are in each vase?
- b) Write this as a division.

Share

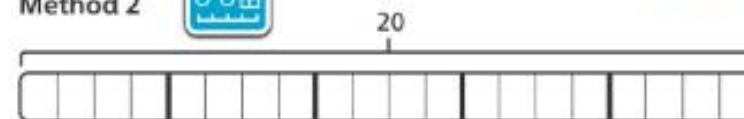
a) Method 1



I took 20 flowers and 5 vases. I put 1 flower in each vase. Then I repeated this until I had no flowers left.



Method 2



There are 4 flowers in each vase.

I used a bar model. I shared 20 into 5 equal parts.



These are both examples of division by sharing.

- b) There are 20 flowers and there are 5 vases.
To work out how many are in each vase we do $20 \div 5$.
There are 4 flowers in each vase, $20 \div 5 = 4$.

Year 3

Multiply by 4

Discover

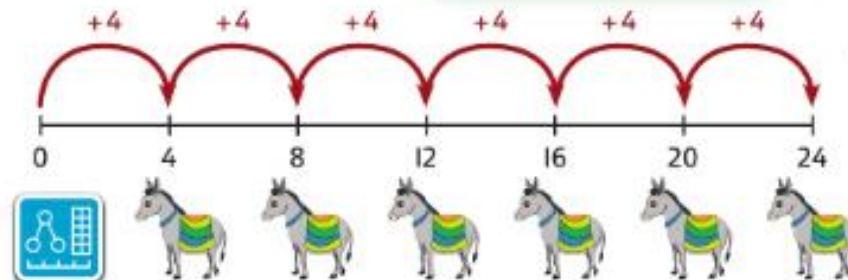


- I** a) There are 6 donkeys.
How many donkey legs are there in total?
Write a multiplication sentence to work out the answer.
- b) A family of 5 people are going donkey trekking.
Mr Peters pays 20 £1 coins in total for him and his family.
Is this the correct amount?

Share

- a) There are 6 donkeys.
Each donkey has 4 legs.

Instead of counting the legs in 1s, I am going to count up in 4s.



$$6 \times 4 = 24$$

There are 24 donkey legs in total.



Remember, we can think of 6×4 as meaning 6 groups of 4, which is what we have.

- b) There are 5 people in the family.
The cost for each person is £4.
The total cost is $5 \times £4 = £20$.
Mr Peters pays the correct amount.



Year 3

Divide by 8

Discover



- 1** a) Each ice lolly mould uses 8 lollipop sticks.
Mr Jones has 24 sticks.
How many moulds can he fill?
- b) Miss Hall has 38 sticks.
How many moulds can she fill?

Share

- a) Mr Jones has 24 lollipop sticks.
Each mould uses 8 sticks.

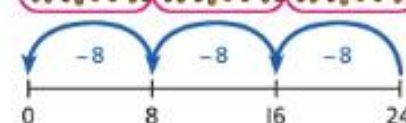
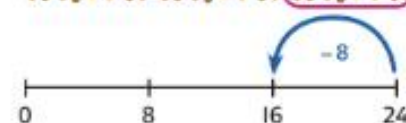


I will put the sticks into groups of 8.
I can use a number line to record what I am doing.

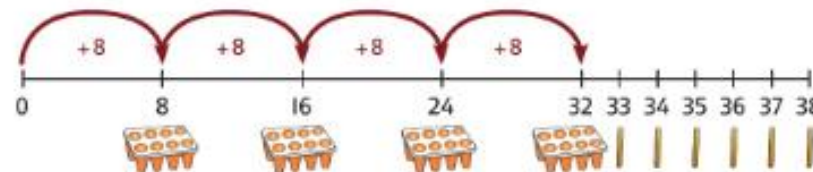


$$24 \div 8 = 3$$

Mr Jones can fill 3 moulds.



- b) Miss Hall has 38 sticks.



Miss Hall can fill 4 moulds.



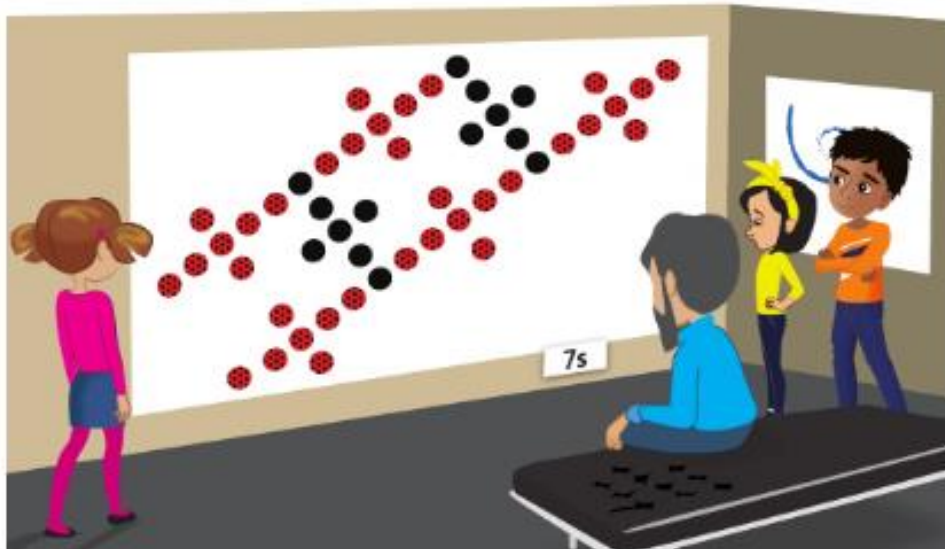
There aren't enough sticks left to fill a fifth mould.



Year 4

Multiply and divide by 7

Discover



- 1 a) Why do you think the painting is called '7s'?

How many groups of 7 are there?

How many circles are there in total?

- b) Another picture is made using groups of 7 circles.

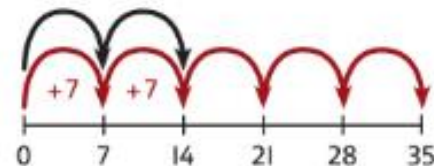
There are 28 circles.

How many groups of 7 circles are there?



Share

- a) The picture is made up of groups of 7 circles.



$$5 \times 7 = 35$$

There are 35 dotted circles.

$$2 \times 7 = 14$$

There are 14 black circles.

$$7 \times 7 = 49$$

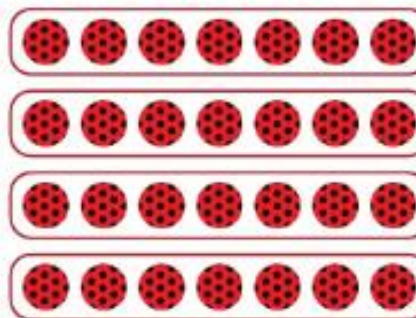
There are 49 circles in total.



I worked out how many patterned circles and how many black circles there are. Then I found the total.



- b)



$$28 \div 7 = 4$$

There are 4 groups of 7 circles.

To group the circles I made an array.



Year 4

Multiply 3 digits by 1 digit

Discover

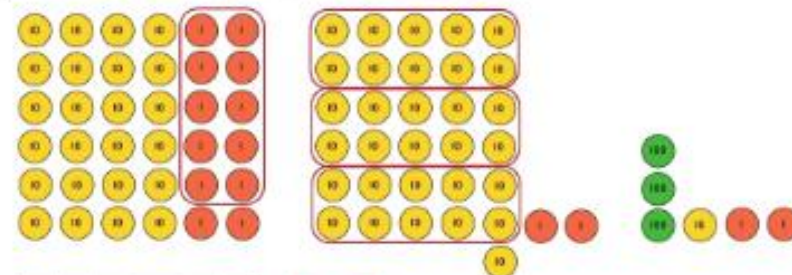


- 1 a) There are 6 rows of seats in each section. Each row has 52 seats.
How many seats are there in a section?
- b) There are 3 sections in the stadium.
How many seats are there in total?



Share

- a) There are 6 rows of seats in each section.



		H	T	O
			5	2
	x			6
		3	1	2



I used this method to multiply a 3-digit number by a 1-digit number.

$$6 \times 52 = 312$$

There are 312 seats in a section.

- b) There are 3 sections in the stadium.
Each section contains 312 seats.

		H	T	O
		3	1	2
	x			3
		9	3	6

$$312 \times 3 = 936$$

There are 936 seats in total.



Year 4

Divide 3-digit numbers

Discover



Each sheep needs 3 squares to graze on.

- 1 a) What division calculation represents the problem:
'How many sheep can be in the field?'
- b) Complete the division calculation.

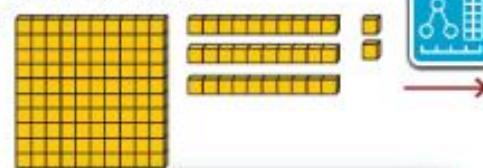
Share

a) There are 132 squares on the field.

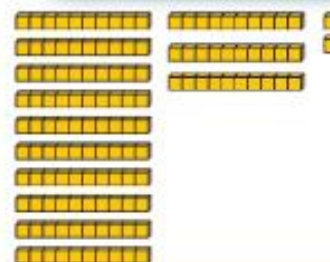
Each sheep needs 3 squares.

To work out how many sheep can go in the field you need to work out $132 \div 3$.

b)



I couldn't share the 100 flat. I exchanged it for ten 10 rods.



There was one 10 rod left over. I couldn't share this. I exchanged it for 10 ones.



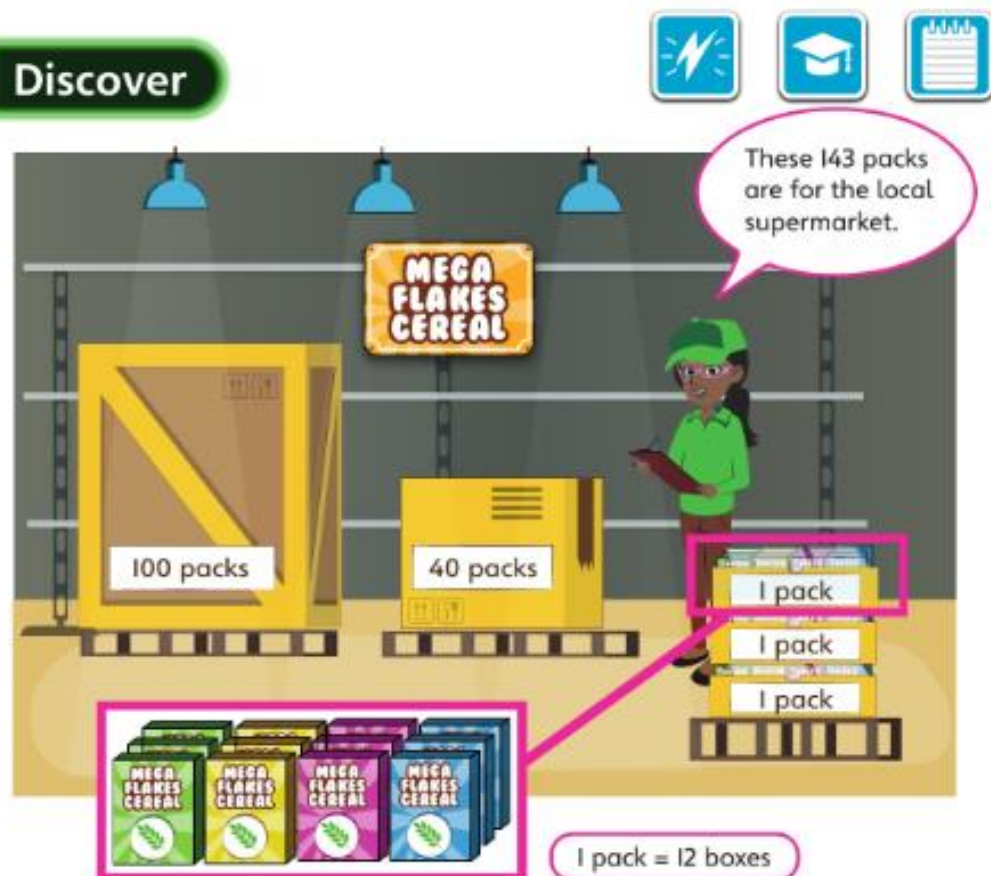
$$132 \div 3 = 44$$



Year 5

Multiply a 3-digit number by a 2-digit number

Discover



- How many boxes of cereal are there in 143 packs?
Use the grid method to work out the answer.
- Check your answer using long multiplication.

Share

- There are 12 boxes of cereal in each pack.

	100	40	3
10	$100 \times 10 = 1,000$	$40 \times 10 = 400$	$3 \times 10 = 30$
2	$100 \times 2 = 200$	$40 \times 2 = 80$	$3 \times 2 = 6$



$$143 \times 12 = 1,716$$

There are 1,716 boxes of cereal in total.

	Th	H	T	O
	1	0	0	0
		4	0	0
		2	0	0
			8	0
			3	0
+				6
	1	7	1	6

- You can extend the method of long multiplication from the last lesson.

	Th	H	T	O
		1	4	3
\times			1	2
		2	8	6
	1	4	3	0
	1	7	1	6

$$143 \times 2$$

$$143 \times 10$$

$$143 \times 12$$

First, I multiplied each digit in the 3-digit number by 2.
Then I multiplied each digit by 10. To do this I put in the 0 and then multiplied each digit by 1.
Finally I added the two calculations together.

$$143 \times 12 = 1,716$$

So the answer found with the grid method is correct.



Year 5

Divide a number up to 4 digits by a 1-digit number ②

Discover



- Set out the division that calculates how many pieces of litter each child picked up.
- Complete the division.

Share

To work this out, I needed to divide 92 by 4. I used the method of short division that we learnt in the last lesson.

- 4 children picked up 92 pieces of litter.

They each picked up the same number of pieces.

	4	9	2

T	O
90 10 10 10 10	20 20
90 10 10 10 10	

First, lay out the problem.



-

		2	
	4	9	2

T	O
90 10 10 10 10	20 20
90 10 10 10 10	

9 tens divided by 4 is 2 remainder 1. Write 2 in the 10s place.

		2	
	4	9	2

T	O
90 10 10 10 10	20 20 20 20 20
90 10 10 10 10	

Exchange the remaining 10 for 10 ones. Now there are 12 ones altogether.

		2	3
	4	9	2

T	O
90 10 10 10 10	20 20 20 20 20
90 10 10 10 10	

12 ones divided by 4 is 3. Write 3 in the 1s place.

$$92 \div 4 = 23$$

Year 5

Efficient division

Discover



- a)** 6 slices make one whole pizza.

How do you know that the 253 slices will not make a whole number of pizzas with no spare slices left over?

- b)** How many whole pizzas can the chefs make?

What fraction of a pizza will be left over?



Share

- a)** We need to find out if 253 can divide exactly by 6.

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
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



I marked all the multiples of 6 on a 100 square. I noticed that they are all even numbers.



6 is a multiple of 2 and 3, so a number that is a multiple of 6 is also a multiple of 2 and 3.

253 is not an even number, so it is not a multiple of 2.

253 cannot divide exactly by 6. There will be some slices of pizza left over.

b)

		0		
6	2	5	3	

		0	4	
6	2	5	3	

		0	4	2	r1
6	2	5	3		



H	T	O
●●	●●●●●	●●●

H	T	O
	●●●●● ●●●●● ●●●●● ●●●●●	●●●

H	T	O
	●●●●● ●●●●● ●●●●● ●●●●●	●●●●● ●●●●● ●●●●●

The chefs can make 42 whole pizzas.

There is 1 slice left over. 1 slice is $\frac{1}{6}$ of a pizza.



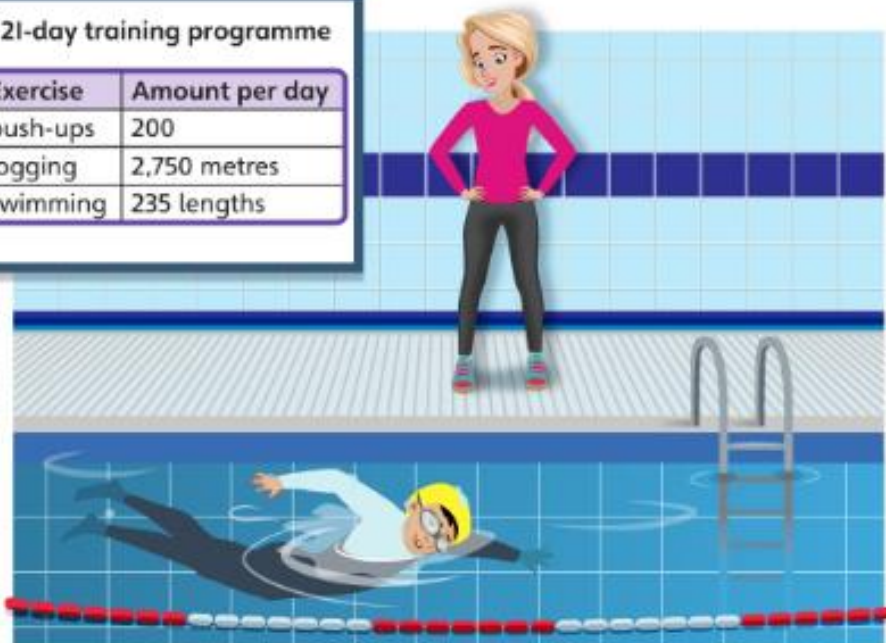
Year 6

Multiply up to a 4-digit number by a 2-digit number

Discover



21-day training programme	
Exercise	Amount per day
push-ups	200
jogging	2,750 metres
swimming	235 lengths



- 1** a) How many lengths do the athletes swim altogether in the 21 days?
Use an area/grid method to work this out.
- b) Use column multiplication to work out the same calculation.

Share

a)

	200	30	5
20	4,000	600	100
1	200	30	5

$4,200 + 630 + 105 = 4,935$



I used the grid method. Sometimes people call it the area method.

			2	3	5	
	x			2	1	
					5	1×5
				3	0	1×30
			2	0	0	1×200
			1	0	0	20×5
			6	0	0	20×30
		4	0	0	0	20×300
		4	9	3	5	21×235



I used **long multiplication**. It was quicker than the grid method.

b)

	235
20	235×20
1	235×1

			2	3	5	
	x			2	1	
			2	3	5	1×235
		4	7	0	0	20×235
		4	9	3	5	21×235



$21 \times 235 = 4,935$. The athletes swim 4,935 lengths in 21 days.

Year 6

Short division

Discover



- Each astronaut has 132 bottles of water for their stay in the space station. How many days will this last for one astronaut?
- The astronauts eat the same amount of fruit purée each week. How many tubes of fruit purée will they eat each week?



Share



a) $6 \times ? = 132$

We can use the method of **short division**.

H	T	O
●	●●●	●●

How many groups of 6 are in 1 hundred?

	0		
6	1	3	2

H	T	O
● →	●●●●●●●●	●●

How many groups of 6 are in 13 tens?

	0	2	
6	1	3	2

H	T	O
	●●●●●●●●	●●●●●●●●

How many groups of 6 are in 12 ones?

	0	2	2
6	1	3	2

$132 \div 6 = 22$

132 bottles of water will last for 22 days for one astronaut.

b)

	0	2	3
12	2	7	6

I knew that $12 \times 20 = 240$, so I could tell that there would be 2 tens in the answer.

I wonder why there is a 2 in the tens.

$276 \div 12 = 23$

The astronauts will eat 23 tubes of fruit purée in one week.





Year 6

Long division with remainders

Discover

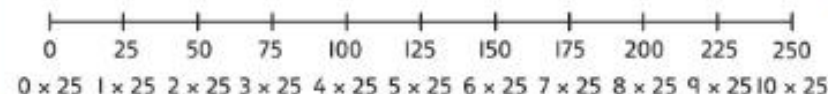


- 1 a) Divide 1,235 by 25.
- b) The race is split into 25 equal stages.
How long is each stage?

Share

I listed my multiples.

- a) Divide 1,235 by 25.



	40	9	
25	1,000	225	10

			4	9	r10
25	1	2	3	5	
-	1	0	0	0	
		2	3	5	
-		2	2	5	
			1	0	

First, I subtracted 40 lots of 25 and then I subtracted 9 lots of 25. There was a remainder of 10.

$$1,235 \div 25 = 49 \text{ remainder } 10.$$

- b) To get a more accurate answer, divide the remainder between all 25 stages, so that it is also divided by 25.

This can then be written as a fraction $\frac{10}{25}$.

$\frac{10}{25}$ simplifies to $\frac{2}{5}$.

Each stage is 49 km plus $\frac{2}{5}$ of a km.

I thought the remainder could be an extra stage at the end, but then the stages would not be equal.