Maths Mastery

Maths teaching in school

- Power maths scheme.
- Mastering number – a National initiative started last year, to ensure a firm foundation in number – from Reception to Year 2.
- Key Instant Recall Facts – starting from year 1.

Power Maths

- Scheme of work for teaching maths mastery.
- Throughout the school, from reception classes to year 6.
- Emphasis is on understanding.
- Based on three phases of understanding – concrete, pictorial and abstract.

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.

Pearson

Key aims of *Power Maths*

Keeping the whole class progressing together

Providing rich problem solving to challenge and engage every child

Practical assessment to reveal misconceptions and inform speedy interventions

Nurturing a growth mindset and building children's confidence in maths

Pearson

What is mastery?

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

We achieve this by …

- Carefully sequenced, small step learning
- Representation that expose mathematical structures
- Developing mathematical thinking
- Building fluency
- Using mathematical language

Pearson

Growth mindset

Fixed mindset	Growth mindset
“I’m not good at maths – I’ve never been good at maths”	“I’m finding maths hard now, but I can improve with time and effort”
“I give up – I can’t make this any better”	“I can improve if I keep trying”
“If I fail I am a failure”	“Most successful people fail along the way”
“I can’t do this – I keep making mistakes”	“Mistakes help me learn”

Growth Mindset

- Everyone can!
- It’s okay to get it wrong.
- Praise hard work.
- Mind your language.
- Build in opportunities for success.

Meet the growth-mindset characters!

Flo

Flo is flexible and creative. She often with new methods to solve problems.

Can we do it differently?

Dexter

Dexter is determined. When he makes a mistake he learns from it and tries again.

Let’s try again!

Meet the growth-mindset characters!

Astrid

Astrid is brave and confident. She is not afraid to make mistakes.

I will share my ideas!

Is there a pattern?

Ash

Ash is curious and inquisitive. He loves to explore new concepts

Pearson

See the lesson structure

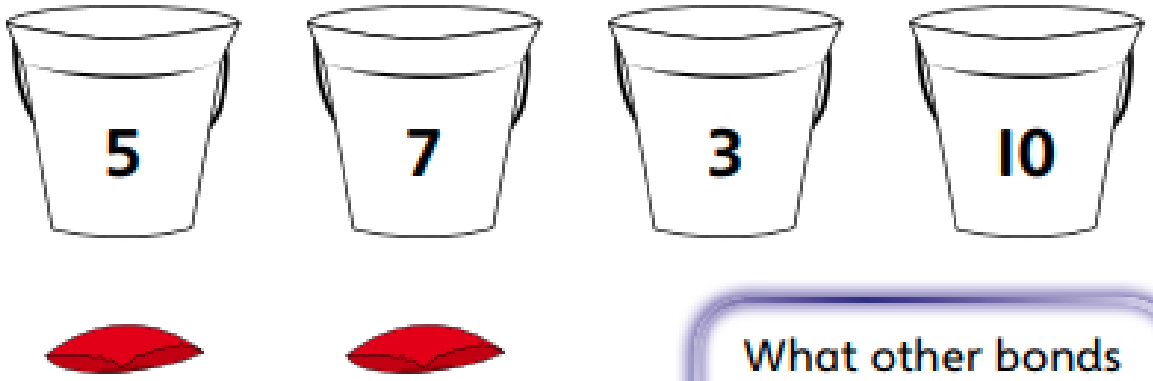
POWER UP! ▶ DISCOVER & SHARE ▶ THINK TOGETHER ▶ PRACTICE ▶ REFLECT

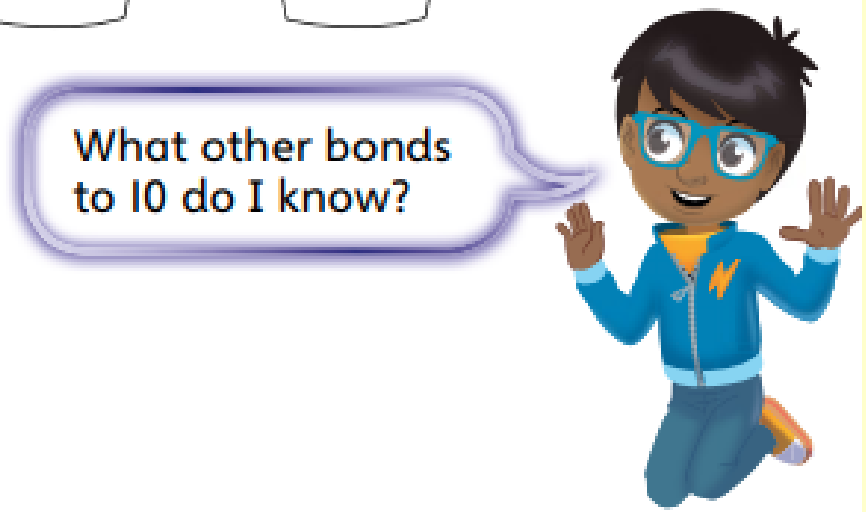
Pearson

Power up or KIRF

Power Up

Work out all the ways to get a score of 10.





$5 + \square = 3 + 7$

$7 + 3 = 10 + \square$

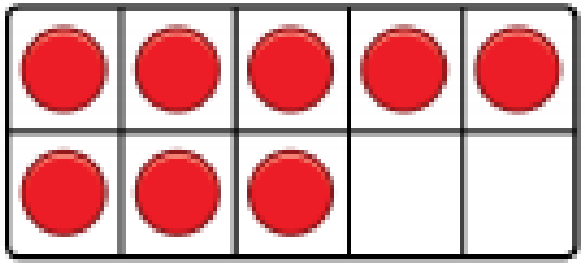
Power up or KIRF

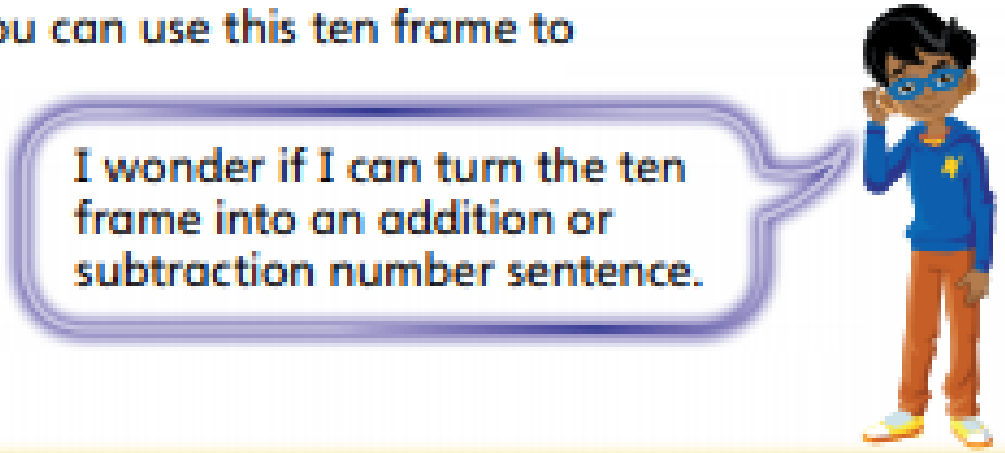
Power Up

Use number bonds to 10 to help with number bonds to 100.

●●● + ☐ = 10	So I know …	▮▮▮ + ☐ = ☐
10 − 4 = ☐	So I know …	100 − ☐ = ☐

Explain to your partner how you can use this ten frame to find a number bond to 100.





Discover and Share

Concrete-Pictorial-Abstract approach

Subtracting tens and ones

Discover

1 a) There are 15 .

How many have eggs?

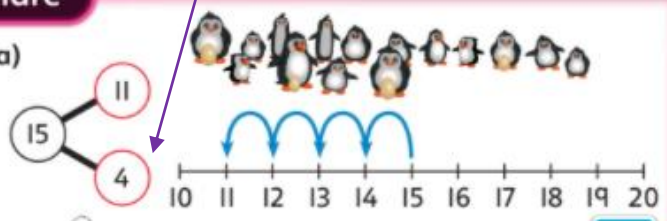
How many do not have eggs?

b) 13 dive into the sea.

How many are left on the ice?

Share

a)



4 have eggs.

15 – 4 = 11

11 do not have eggs.

b) 13 dive into the sea.

I can count back 13 from 15. This takes time and I often make mistakes.

15 – 10 = 5

5 – 3 = 2

So

15 – 13 = 2

There are 2 left on the ice.

I know that 13 is 10 and 3. I can subtract the 10 first and then 3.

Engaging scenarios

Pearson

Discover and Share

Concrete-Pictorial-Abstract approach

Unit 7: Multiplication and division (2), Lesson 8

Dividing up to a 4-digit number by a 1-digit number 2

Discover

1 a) How many pieces of litter has each child picked up?

b) Mr Jones has picked up 351 pieces of litter. He shares them equally between 3 bags.

How many pieces of litter are in each bag?

36

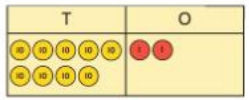
Share

a) 4 children picked up 92 pieces of litter.

They each picked up the same number of pieces.

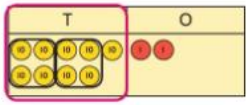
To work this out, I need to divide 92 by 4. I will use the method of short division that we learnt in the last lesson.

$4 \overline{)92}$



First, lay out the problem.

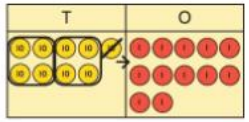
$4 \overline{)92}$ → $\begin{array}{r} 2 \\ 4 \overline{)92} \end{array}$



How many groups of 4 go into 9 tens?

2 groups of 4 tens with 1 ten left over.

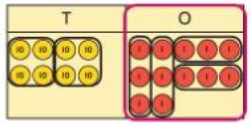
$\begin{array}{r} 2 \\ 4 \overline{)92} \end{array}$



Exchange the 1 ten left over for 10 ones.

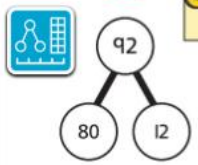
We now have 12 ones.

$\begin{array}{r} 23 \\ 4 \overline{)92} \end{array}$



How many groups of 4 go into 12 ones?

3 groups of 4 ones.



I used a part-whole model to partition the number into two numbers that divide by 4.

$80 \div 4 = 20$ $12 \div 4 = 3$

$20 + 3 = 23$

$92 \div 4 = 23$, so each child picked up 23 pieces of litter.

Engaging scenarios

Pearson

Think together

Think together

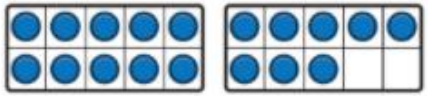
1

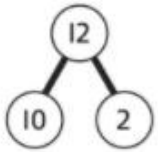
There are 18 .

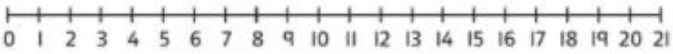
A penguin eats 12 .

How many are left?

Use 1 for each .







18 – 10 = ☐

☐ – 2 = ☐

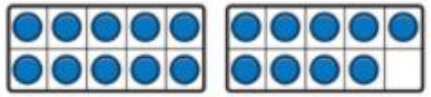
So

18 – 12 = ☐

There are ☐ left.

Unit 8: Subtraction within 20, Lesson 2

2 Work out 19 – 14.

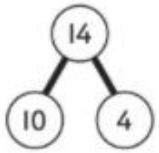


19 – ☐ = ☐

☐ – ☐ = ☐

So

19 – 14 = ☐



3 What is 18 – 15?

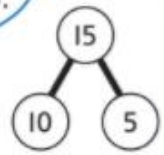
CHALLENGE

I subtracted 10 first and then 5.

I subtracted 5 first and then 10.

Danny

Tamsin



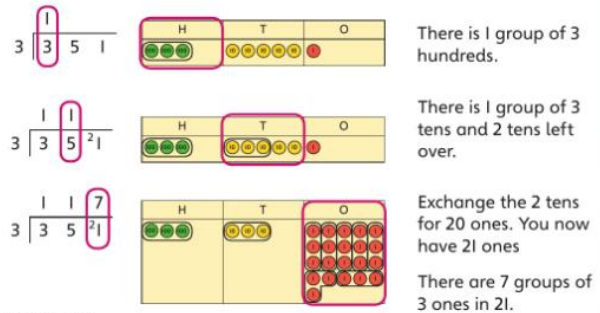
Do Danny and Tamsin get the same answer?

Danny	Tamsin
18 – 10 = ☐	18 – 5 = ☐
☐ – ☐ = ☐	☐ – ☐ = ☐
So	So
18 – 15 = ☐	18 – 15 = ☐

Pearson

Think together

b) Mr Jones shares 351 pieces of litter equally between 3 bags.



351 ÷ 3 = 117

There are 117 pieces of litter in each bag.

Think together

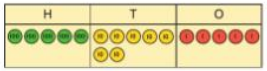
1 The children have a flask containing 575 ml of juice.

They share the juice equally among themselves and Mr Jones.

How much juice does each person get?

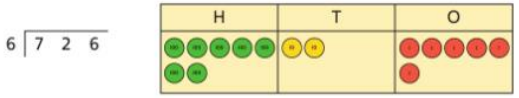
575 ÷ 5 = ☐

Each person gets ☐ ml of juice.

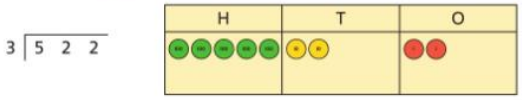


2 Complete these short divisions.

a) 726 ÷ 6 = ☐



b) 522 ÷ 3 = ☐



3 **a)** Look at these division problems.

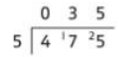
CHALLENGE

There are 312 eggs. How many boxes of 6 eggs can be made?	Divide 1,980 by 2	485 ÷ 5

What is different about these divisions compared with the ones you have been doing so far?

I think there is something different in the first step of each division.

b) Max tries to work out the third division problem. What mistake has Max made?



: 5B p27

Friendly, supportive characters help children develop a growth mindset.

Pearson

Practice

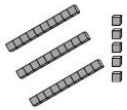
Questions are presented in a logical sequence.

10 more, 10 less

1 Complete the number sentences.

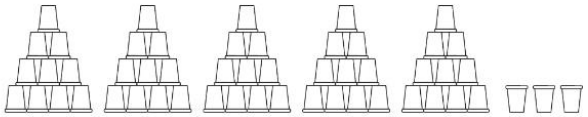
a)  +

10 more than 24 is ☐.

b)  + 

10 more than 35 is ☐.

2 Max has 53 cups.



He gets 10 more.

How many cups does he have now?

Max has ☐ in total.

3 Complete the number tracks.

a)

44	54	64			94

b)

7	17	27					77

c)

78	68	58				18

4 Complete the table.

10 less	Number	10 more
	30	
	72	
23		
		54

5 Complete each number sentence.

a) 10 more than 25 is ☐.

b) ☐ is 10 more than 73.

c) 10 less than 89 is ☐.

100

Calculations are connected so that children think about the underlying concepts.

Pearson

Practice

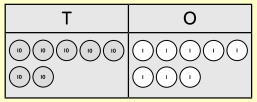
Questions are presented in a logical sequence.

→ Textbook 5B p36

Dividing up to a 4-digit number by a 1-digit number 2

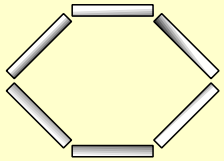
1 Mo is dividing 78 by 3. Complete his working.

3 | 7 8



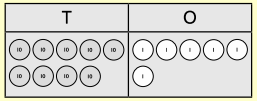
78 ÷ 3 = ☐

2 Olivia is making hexagons with straws, like this:



Olivia has 96 straws. How many hexagons can she make?

6 | 9 6



Oliva can make ☐ hexagons.

3 Work out these divisions.

a) 642 ÷ 6 = ☐ **b)** 725 ÷ 5 = ☐ **c)** 5,016 ÷ 3 = ☐

6 | 6 4 2 5 | 7 2 5 3 | 5 0 1 6

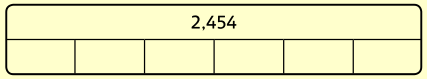
4 Calculate the answers to these divisions.

a) 7,924 ÷ 7 = ☐ **b)** 711 ÷ 3 = ☐ **c)** 916 ÷ 4 = ☐

7 | 7 9 2 4

5 What division does this bar model model represent?

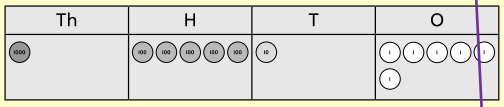
Write the calculation and then solve it.



6 Isla has made a number and then divided her number by 4 using short division.

What mistake has Isla made?

0 8 7 9
4 | 1 3 5 3 1 3 6



7 Fill in the missing numbers in these short divisions.

a)
2
4 | 1 7 2

b)
2 2
3 | 8 7 3

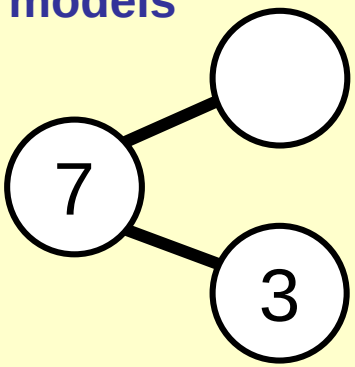
c)
6
5 | 1 3 0

Calculations are connected so that children think about the underlying concepts.

Pearson

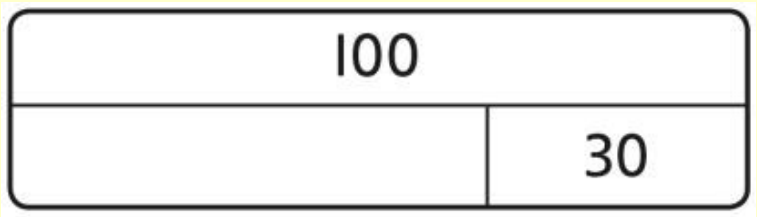
Models and representations

Part-whole models



Shows how numbers can be split into parts. Helps show the connection between addition and subtraction.

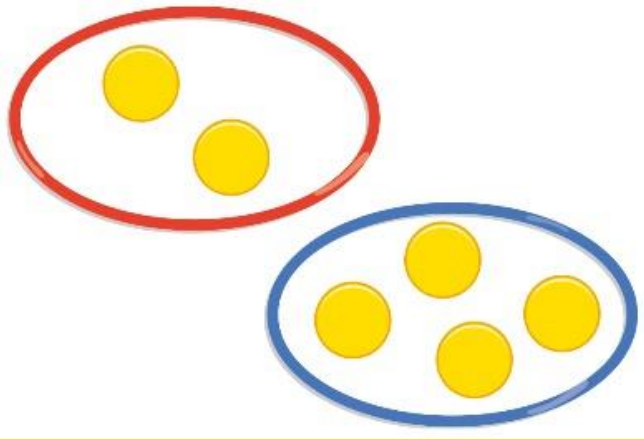
Bar models

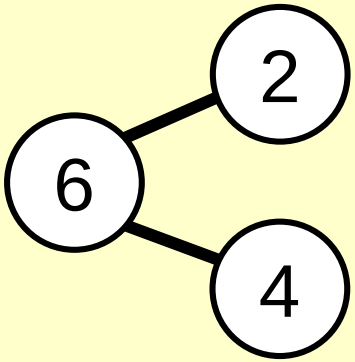


Helps show the maths problem as a picture.

Pearson

Models and representations



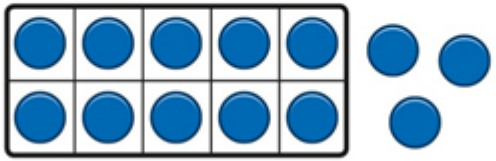
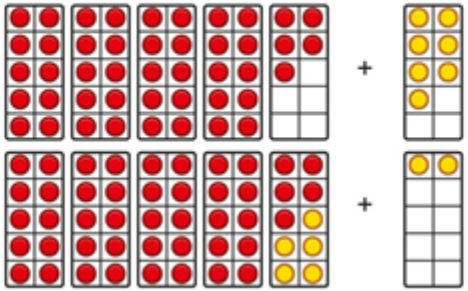
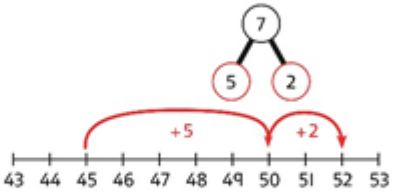


$2 + 4 = 6$

Calculations

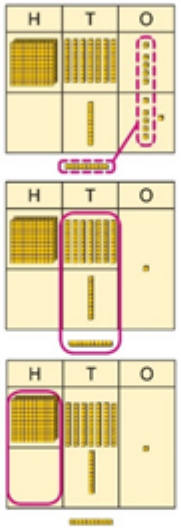
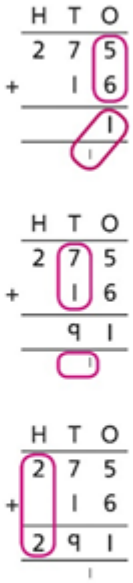
- Addition
- Subtraction
- Multiplication
- Division

Addition

	Concrete	Pictorial	Abstract
Y1	**Understanding teen numbers as a complete 10 and some more** Complete a group of 10 objects and count more.  *13 is 10 and 3 more.*	**Understanding teen numbers as a complete 10 and some more** Use a ten frame to support understanding of a complete 10 for teen numbers.  *13 is 10 and 3 more.*	**Understanding teen numbers as a complete 10 and some more.** *1 ten and 3 ones equal 13.* *10 + 3 = 13*
Y2	Complete a 10 using number bonds.  *There are 4 tens and 5 ones.* *I need to add 7. I will use 5 to complete a 10, then add 2 more.*	Complete a 10 using number bonds. 	Complete a 10 using number bonds.  *7 = 5 + 2* *45 + 5 + 2 = 52*

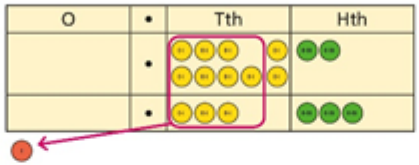
Addition

Y3

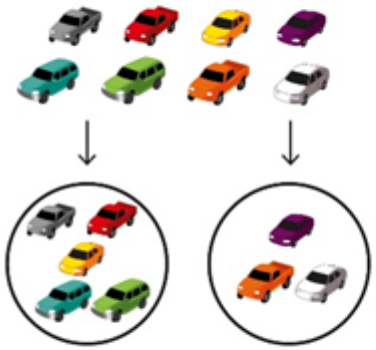
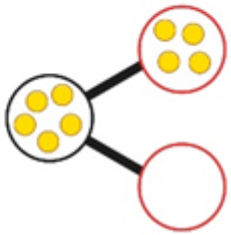
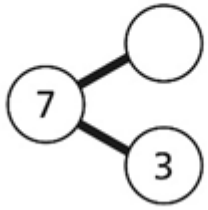
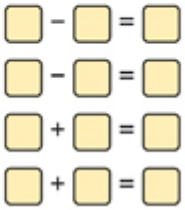
Concrete	Pictorial	Abstract
Use place value equipment to model addition and understand where exchange is required. *Use place value counters to represent 154 + 72.* *Use this to decide if any exchange is required.* *There are 5 tens and 7 tens. That is 12 tens so I will exchange.*	Represent the required exchange on a place value grid using equipment. *275 + 16 = ?*  *275 + 16 = 291* Note: In this example, a mental method may be more efficient. The numbers for the example calculation have been chosen to allow children to visualise the concept and see how the method relates to place value. Children should be encouraged at every stage to select methods that are accurate and efficient.	Use a column method with exchange. Children must understand how the method relates to place value at each stage of the calculation.  *275 + 16 = 291*

Addition Y5

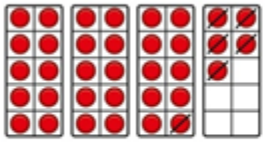
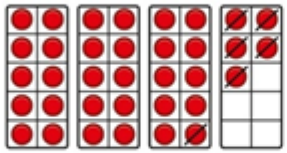
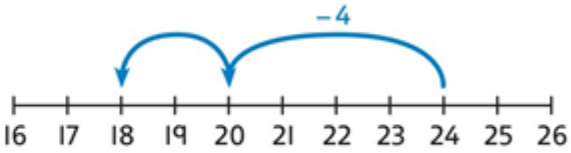
Y5

Concrete	Pictorial	Abstract
Use place value equipment to represent additions. *Show 0·23 + 0·45 using place value counters.*	Use place value equipment on a place value grid to represent additions. Represent exchange where necessary.  O · Tth Hth 0 · 9 2 + 0 · 3 3 1 · 2 5 1 Include examples where the numbers of decimal places are different.  O · Tth Hth 5 · 0 0 + 1 · 2 5 6 · 2 5	Add using a column method, ensuring that children understand the link with place value. O · Tth Hth 0 · 2 3 + 0 · 4 5 0 · 6 8 Include exchange where required, alongside an understanding of place value. O · Tth Hth 0 · 9 2 + 0 · 3 3 1 · 2 5 1 Include additions where the numbers of decimal places are different. *3.4 + 0.65 = ?* O · Tth Hth 3 · 4 0 + 0 · 6 5 ·

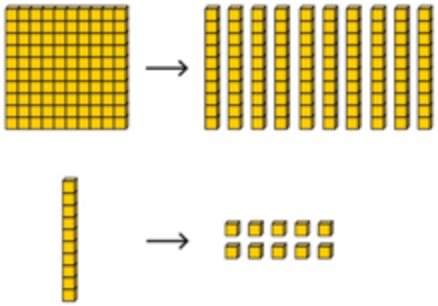
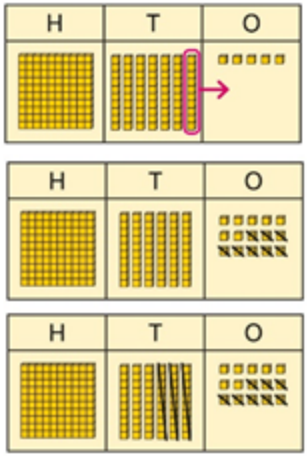
Subtraction – Y1

Concrete	Pictorial	Abstract
Finding a missing part, given a whole and a part Children separate a whole into parts and understand how one part can be found by subtraction.  *8 − 5 = ?*	**Finding a missing part, given a whole and a part** Children represent a whole and a part and understand how to find the missing part by subtraction.  5 − 4 = ☐	**Finding a missing part, given a whole and a part** Children use a part-whole model to support the subtraction to find a missing part.  *7 − 3 = ?* Children develop an understanding of the relationship between addition and subtraction facts in a part-whole model.  

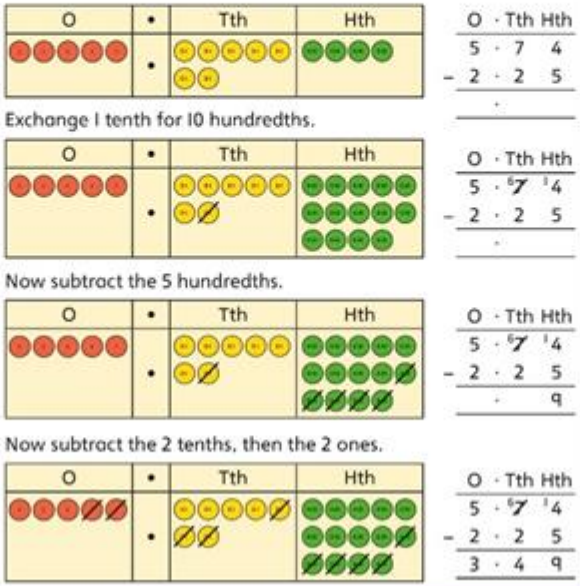
Subtraction – Y2

Concrete	Pictorial	Abstract
Bridge 10 by using known bonds.  *35 − 6* *I took away 5 counters, then 1 more.*	Bridge 10 by using known bonds.  *35 − 6* *First, I will subtract 5, then 1.*	Bridge 10 by using known bonds.  *24 − 6 = ?* *24 − 4 − 2 = ?*

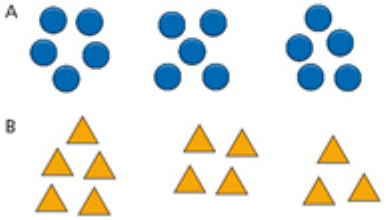
Subtraction – Y3

Concrete	Pictorial	Abstract
Use equipment to enact the exchange of 1 hundred for 10 tens, and 1 ten for 10 ones. 	*Model the required exchange on a place value grid.* *175 − 38 = ?* *I need to subtract 8 ones, so I will exchange a ten for 10 ones.* 	Use column subtraction to work accurately and efficiently.  175 − 38 = 137 If the subtraction is a 3-digit number subtract a 2-digit number, children should understand how the recording relates to the place value, and so how to line up the digits correctly. Children should also understand how to exchange in calculations where there is a zero in the 10s column. 

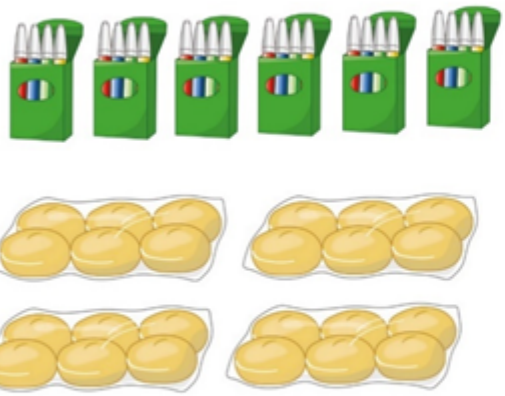
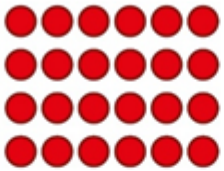
Subtraction – Y5

Concrete	Pictorial	Abstract
Explore complements to a whole number by working in the context of length.  1 m – ☐ m = ☐ m *1 − 0·49 = ?*	Use a place value grid to represent the stages of column subtraction, including exchanges where required. *5·74 − 2·25 = ?*  	Use column subtraction, with an understanding of place value, including subtracting numbers with different numbers of decimal places. *3·921 − 3·75 = ?* O · Tth Hth Thth 3 · 9 2 1 − 3 · 7 5 0

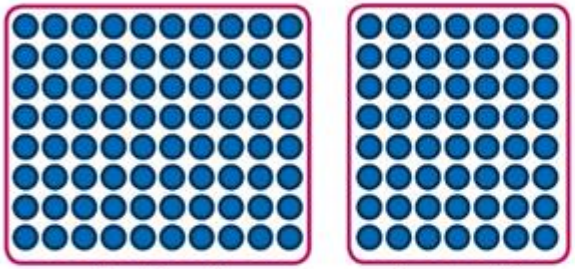
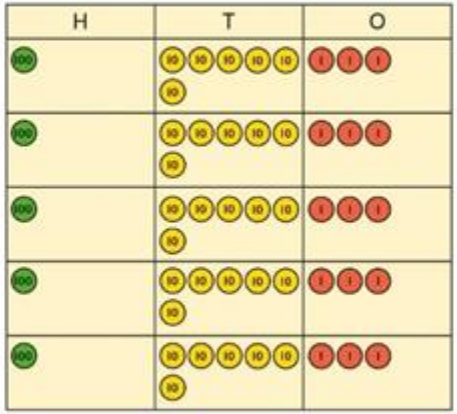
Multiplication – Y1

Concrete	Pictorial	Abstract
Recognising and making equal groups Children arrange objects in equal and unequal groups and understand how to recognise whether they are equal. A B C 	**Recognising and making equal groups** Children draw and represent equal and unequal groups. A B 	**Describe equal groups using words** *Three equal groups of 4.* *Four equal groups of 3.*

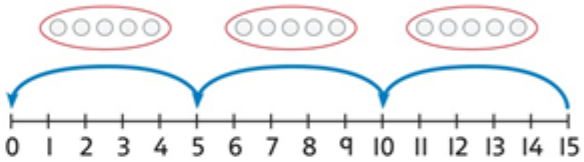
Multiplication – Y3

Concrete	Pictorial	Abstract
Understand how to use times-tables facts flexibly.  *There are 6 groups of 4 pens.* *There are 4 groups of 6 bread rolls.* *I can use 6 × 4 = 24 to work out both totals.*	Understand how times-table facts relate to commutativity.  *6 × 4 = 24* *4 × 6 = 24*	Understand how times-table facts relate to commutativity. *I need to work out 4 groups of 7.* *I know that 7 × 4 = 28* *so, I know that* *4 groups of 7 = 28* *and* *7 groups of 4 = 28.*

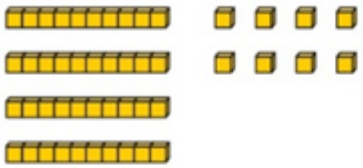
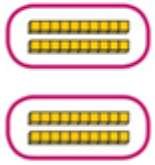
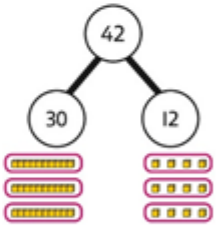
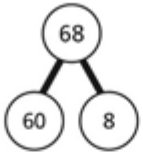
Multiplication - Y5

Concrete	Pictorial	Abstract
Explore how to use partitioning to multiply efficiently. *8 × 17 = ?*  8 × 10 = 80 8 × 7 = 56 80 + 56 = 136 *So, 8 × 17 = 136*	Represent multiplications using place value equipment and add the 1s, then 10s, then 100s, then 1,000s.  	Use an area model and then add the parts. 5 × (100 + 60 + 3) 100 × 5 = 500 60 × 5 = 300 3 × 5 = 15 Use a column multiplication, including any required exchanges. 136 × 6 = 816 2 3

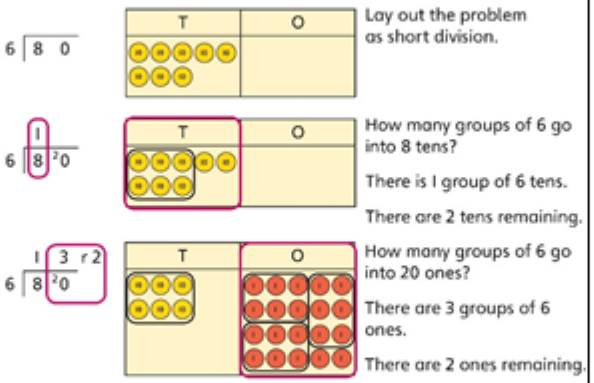
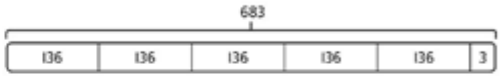
Division - Y1

Concrete	Pictorial	Abstract
Grouping Learn to make equal groups from a whole and find how many equal groups of a certain size can be made. Sort a whole set people and objects into equal groups.  *There are 10 children altogether.* *There are 2 in each group.* *There are 5 groups.*	**Grouping** Represent a whole and work out how many equal groups.  *There are 10 in total.* *There are 5 in each group.* *There are 2 groups.*	**Grouping** Children may relate this to counting back in steps of 2, 5 or 10. 

Division – Y3

Concrete	Pictorial	Abstract
Children explore dividing 2-digit numbers by using place value equipment.  *48 ÷ 2 = ?* *First divide the 10s.*  *Then divide the 1s.* 	Children explore which partitions support particular divisions.  *I need to partition 42 differently to divide by 3.*  *42 = 30 + 12* *42 ÷ 3 = 14*	Children partition a number into 10s and 1s to divide where appropriate.  *60 ÷ 2 = 30* *8 ÷ 2 = 4* *30 + 4 = 34* *68 ÷ 2 = 34* Children partition flexibly to divide where appropriate. *42 ÷ 3 = ?* *42 = 40 + 2* *I need to partition 42 differently to divide by 3.* *42 = 30 + 12* *30 ÷ 3 = 10* *12 ÷ 3 = 4* *10 + 4 = 14* *42 ÷ 3 = 14*

Division – Y5

Concrete	Pictorial	Abstract
Understand remainders using concrete versions of a problem. *80 cakes divided into trays of 6.*  *80 cakes in total. They make 13 groups of 6, with 2 remaining.*	Use short division and understand remainders as the last remaining 1s. 	In problem solving contexts, represent divisions including remainders with a bar model.  *683 = 136 × 5 + 3* *683 ÷ 5 = 136 r 3*

Number facts

By the end of Year 2 children should know:

- All addition and subtraction facts for each number to 20 fluently.
- Facts for the 2, 5 and 10 multiplication tables and related division facts.

Number facts

By the end of Year 3 children should know:

- Multiplication facts for 2, 3, 4, 5, 8, and 10 and corresponding division facts.

Number facts

By the end of Year 4 children should know:

- Multiplication facts up to 12 x 12 and corresponding division facts.

Key Instant Recall Facts

Year 1 – Autumn 2

I know number bonds for each number to 6.

By the end of this half term, children should know the following facts. The aim is for them to recall these facts **instantly**.

0 + 1 = 1	0 + 4 = 4	0 + 6 = 6
1 + 0 = 1	1 + 3 = 4	1 + 5 = 6
	2 + 2 = 4	2 + 4 = 6
0 + 2 = 2	3 + 1 = 4	3 + 3 = 6
1 + 1 = 2	4 + 0 = 4	4 + 2 = 6
2 + 0 = 2		5 + 1 = 6
	0 + 5 = 5	6 + 0 = 6
0 + 3 = 3	1 + 4 = 5	
1 + 2 = 3	2 + 3 = 5	
2 + 1 = 3	3 + 2 = 5	
3 + 0 = 3	4 + 1 = 5	
	5 + 0 = 5	

Key Vocabulary

What is 3 **add** 2?
What is 2 **plus** 2?
What is 5 **take away** 2?
What is 1 **less than** 4?

They should be able to answer these questions in any order, including missing number questions e.g. 3 + ◯ = 5 or 4 – ◯ = 2.

Top Tips

The secret to success is practising **little** and **often**. Use time wisely. Can you practise these KIRFs while walking to school or during a car journey? You don't need to practise them all at once: perhaps you could have a fact of the day. If you would like more ideas, please speak to your child's teacher.

Use practical resources – Your child has one potato on their plate and you give them three more. Can they predict how many they will have now?

Make a poster – We use Numicon at school. You can find pictures of the Numicon shapes here: bit.ly/NumiconPictures – your child could make a poster showing the different ways of making 5.

Play games – You can play number bond pairs online at www.conkermaths.com and then see how many questions you can answer in just one minute.

Key Instant Recall Facts

Year 2 – Autumn 2

I know doubles and halves of numbers to 20.

By the end of this half term, children should know the following facts. The aim is for them to recall these facts **instantly**.

0 + 0 = 0	½ of 0 = 0	
1 + 1 = 1	½ of 2 = 1	11 + 11 = 22
2 + 2 = 4	½ of 4 = 2	12 + 12 = 24
3 + 3 = 6	½ of 6 = 3	13 + 13 = 26
4 + 4 = 8	½ of 8 = 4	14 + 14 = 28
5 + 5 = 10	½ of 10 = 5	15 + 15 = 30
6 + 6 = 12	½ of 12 = 6	16 + 16 = 32
7 + 7 = 14	½ of 14 = 7	17 + 17 = 34
8 + 8 = 16	½ of 16 = 8	18 + 18 = 36
9 + 9 = 18	½ of 18 = 9	19 + 19 = 38
10 + 10 = 20	½ of 20 = 10	20 + 20 = 40

Key Vocabulary

What is **double** 9?

What is **half** of 14?

Top Tips

The secret to success is practising **little** and **often**. Use time wisely. Can you practise these KIRFs while walking to school or during a car journey? You don't need to practise them all at once: perhaps you could have a fact of the day. If you would like more ideas, please speak to your child's teacher.

Use what you already know – Encourage your child to find the connection between the 2 times table and double facts.

Ping Pong – In this game, the parent says, "Ping," and the child replies, "Pong." Then the parent says a number and the child doubles it. For a harder version, the adult can say, "Pong." The child replies, "Ping," and then halves the next number given.

Practise online – Go to Purple Mash Maths and see how many questions you can answer in just 90 seconds.

Key Instant Recall Facts

Year 3 – Autumn 2

I know the multiplication and division facts for the 3 times table.

By the end of this half term, children should know the following facts. The aim is for them to recall these facts **instantly**.

3 × 1 = 3	1 × 3 = 3	3 ÷ 3 = 1	3 ÷ 1 = 3
3 × 2 = 6	2 × 3 = 6	6 ÷ 3 = 2	6 ÷ 2 = 3
3 × 3 = 9	3 × 3 = 9	9 ÷ 3 = 3	9 ÷ 3 = 3
3 × 4 = 12	4 × 3 = 12	12 ÷ 3 = 4	12 ÷ 4 = 3
3 × 5 = 15	5 × 3 = 15	15 ÷ 3 = 5	15 ÷ 5 = 3
3 × 6 = 18	6 × 3 = 18	18 ÷ 3 = 6	18 ÷ 6 = 3
3 × 7 = 21	7 × 3 = 21	21 ÷ 3 = 7	21 ÷ 7 = 3
3 × 8 = 24	8 × 3 = 24	24 ÷ 3 = 8	24 ÷ 8 = 3
3 × 9 = 27	9 × 3 = 27	27 ÷ 3 = 9	27 ÷ 9 = 3
3 × 10 = 30	10 × 3 = 30	30 ÷ 3 = 10	30 ÷ 10 = 3
3 × 11 = 33	11 × 3 = 33	33 ÷ 3 = 11	33 ÷ 11 = 3
3 × 12 = 36	12 × 3 = 36	36 ÷ 3 = 12	36 ÷ 12 = 3

Key Vocabulary

What is 3 **multiplied by** 8?

What is 8 **times** 3?

What is 24 **divided by** 3?

They should be able to answer these questions in any order, including missing number questions e.g. 3 × ◯ = 18 or ◯ ÷ 3 = 11.

Top Tips

The secret to success is practising **little** and **often**. Use time wisely. Can you practise these KIRFs while walking to school or during a car journey? You don't need to practise them all at once: perhaps you could have a fact family of the day. If you would like more ideas, please speak to your child's teacher.

Songs and Chants – You can buy Times Tables CDs or find multiplication songs and chants online. If your child creates their own song, this can make the times tables even more memorable.

Buy one get three free – If your child knows one fact (e.g. 3 × 5 = 15), can they tell you the other three facts in the same fact family?

Warning! – When creating fact families, children sometimes get confused by the order of the numbers in the division number sentence. It is tempting to say that the biggest number goes first, but it is more helpful to say that the answer to the multiplication goes first, as this will help your child more in later years when they study fractions, decimals and algebra.
E.g. 3 × 12 = 36. The answer to the multiplication is 36, so 36 ÷ 3 = 12 and 36 ÷ 12 = 3

Key Instant Recall Facts

Year 4 – Autumn 2

I know the multiplication and division facts for the 6 times table.

By the end of this half term, children should know the following facts. The aim is for them to recall these facts **instantly**.

6 × 1 = 6	1 × 6 = 6	6 ÷ 6 = 1	6 ÷ 1 = 6
6 × 2 = 12	2 × 6 = 12	12 ÷ 6 = 2	12 ÷ 2 = 6
6 × 3 = 18	3 × 6 = 18	18 ÷ 6 = 3	18 ÷ 3 = 6
6 × 4 = 24	4 × 6 = 24	24 ÷ 6 = 4	24 ÷ 4 = 6
6 × 5 = 30	5 × 6 = 30	30 ÷ 6 = 5	30 ÷ 5 = 6
6 × 6 = 36	6 × 6 = 36	36 ÷ 6 = 6	36 ÷ 6 = 6
6 × 7 = 42	7 × 6 = 42	42 ÷ 6 = 7	42 ÷ 7 = 6
6 × 8 = 48	8 × 6 = 48	48 ÷ 6 = 8	48 ÷ 8 = 6
6 × 9 = 54	9 × 6 = 54	54 ÷ 6 = 9	54 ÷ 9 = 6
6 × 10 = 60	10 × 6 = 60	60 ÷ 6 = 10	60 ÷ 10 = 6
6 × 11 = 66	11 × 6 = 66	66 ÷ 6 = 11	66 ÷ 11 = 6
6 × 12 = 72	12 × 6 = 72	72 ÷ 6 = 12	72 ÷ 12 = 6

Key Vocabulary

What is 8 **multiplied by** 6?

What is 6 **times** 8?

What is 24 **divided by** 6?

They should be able to answer these questions in any order, including missing number questions e.g. 6 × ◯ = 72 or ◯ ÷ 6 = 7.

Top Tips

The secret to success is practising **little** and **often**. Use time wisely. Can you practise these KIRFs while walking to school or during a car journey? You don't need to practise them all at once: perhaps you could have a fact family of the day. If you would like more ideas, please speak to your child's teacher.

Songs and Chants – You can buy Times Tables CDs or find multiplication songs and chants online. If your child creates their own song, this can make the times tables even more memorable.

Double your threes – Multiplying a number by 6 is the same as multiplying by 3 and then doubling the answer. 7 × 3 = 21 and double 21 is 42, so 7 × 6 = 42.

Buy one get three free – If your child knows one fact (e.g. 3 × 6 = 18), can they tell you the other three facts in the same fact family?

Warning! – When creating fact families, children sometimes get confused by the order of the numbers in the division number sentence. It is tempting to say that the biggest number goes first, but it is more helpful to say that the answer to the multiplication goes first, as this will help your child more in later years when they study fractions, decimals and algebra.
E.g. 6 × 12 = 72. The answer to the multiplication is 72, so 72 ÷ 6 = 12 and 72 ÷ 12 = 6

Key Instant Recall Facts

Year 5 – Autumn 2

I can identify prime numbers up to 20.

By the end of this half term, children should know the following facts. The aim is for them to recall these facts **instantly**.

A prime number is a number with no factors other than itself and one.
The following numbers are prime numbers:
2, 3, 5, 7, 11, 13, 17, 19

A composite number is divisible by a number other than 1 or itself.
The following numbers are composite numbers:
4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20

Key Vocabulary

prime number
composite number
factor
multiple

Children should be able to explain how they know that a number is composite.
E.g. 15 is composite because it is a multiple of 3 and 5.

Top Tips

The secret to success is practising **little** and **often**. Use time wisely. Can you practise these KIRFs while walking to school or during a car journey? You don't need to practise them all at once: perhaps you could have a fact of the day. If you would like more ideas, please speak to your child's teacher.

It's really important that your child uses mathematical vocabulary accurately. Choose a number between 2 and 20. How many correct statements can your child make about this number using the vocabulary above?

Make a set of cards for the numbers from 2 to 20. How quickly can your child sort these into prime and composite numbers? How many even prime numbers can they find? How many odd composite numbers?

Key Instant Recall Facts

Year 6 – Autumn 2

I can identify common factors of a pair of numbers.

By the end of this half term, children should know the following facts. The aim is for them to recall these facts **instantly**.

The factors of a number are all numbers which divide it with no remainder.

E.g. the factors of 24 are 1, 2, 3, 4, 6, 8, 12, and 24.
The factors of 56 are 1, 2, 4, 7, 8, 14, 28 and 56.

The common factors of two numbers are the factors they share.

E.g. the common factors of 24 and 56 are 1, 2, 4 and 8.

The greatest common factor of 24 and 56 is 8.

Key Vocabulary

factor
common factor
multiple
greatest common factor

Children should be able to explain how they know that a number is a common factor.
E.g. 8 is a common factor of 24 and 56 because $24 = 8 \times 3$ and $56 = 8 \times 7$.

Top Tips

The secret to success is practising **little** and **often**. Use time wisely. Can you practise these KIRFs while walking to school or during a car journey? If your child is not yet confident with identifying factor pairs of a number, you may want to refer to the Year 5 Summer 2 sheet to practise this first. If you would like more ideas, please speak to your child's teacher.

There are many online games to practise finding the greatest common factor, for example:
http://www.fun4thebrain.com/beyondfacts/gcfsketch.html

Choose two numbers. Take it in turns to name factors. Who can find the most?

Homework

Mathletics – activities are set each week, related as much as possible to the learning in class.
Live Mathletics gives many opportunities to practice some key facts.

www.princessfrederica.brent.sch.uk/

Curriculum Overview

(scroll down to the bottom)

Maths

Calculation policy

KIRFS: Key Instant Recall Facts

Please ask any questions.

Thank you for your continuing interest in maths.