Maths in Key Stage Two

Year 3, 4, 5 and 6

National Curriculum LKS2

- The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value.

- At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.

- By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.

National Curriculum UKS2

- The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.

- Pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

- By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.

Topics in KS2 Maths

- Number and place value
- Addition and Subtraction
- Multiplication and Division
- Fractions (decimals Y4, percentages Y5)
- Measurement
- Shape
- Position and Direction
- Statistics
- Ratio and Proportion – Year 6
- Algebra – Year 6

White Rose Maths

Teaching for Mastery

These overviews are designed to support a mastery approach to teaching and learning and have been designed to support the aims and objectives of the new National Curriculum.

The overviews:

- have number at their heart. A large proportion of time is spent reinforcing number to build competency
- ensure teachers stay in the required key stage and support the ideal of depth before breadth.
- ensure students have the opportunity to stay together as they work through the schemes as a whole group
- provide plenty of opportunities to build reasoning and problem solving elements into the curriculum.

For more guidance on teaching for mastery, visit the NCETM website

https://www.ncetm.org.uk/resources/47230

Concrete – Pictorial - Abstract

As an organisation we believe that all children, when introduced to a new concept, should have the opportunity to build competency by taking this approach.

Concrete – children should have the opportunity to use concrete objects and manipulatives to help them understand what they are doing.

Pictorial – alongside this children should use pictorial representations. These representations can then be used to help reason and solve problems.

Abstract – both concrete and pictorial representations should support children's understanding of abstract methods.
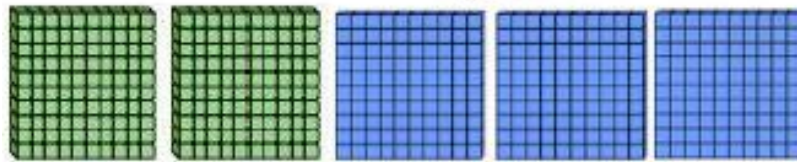
We have produced a CPD unit for teachers in schools;

https://www.tes.com/teaching-resource/the-importance-of-concrete-professional-development-11476476

Addition and Subtraction

Year 3	Year 4	Year 5	Year 6
Add and Subtract multiples of 100	Add and Subtract 1s, 10s, 100s & 1000s		
Add 2-digit and 3-digit numbers	Add two 4-digit numbers	Add whole numbers with more than 4-digits	Add and subtract whole numbers
Add two 3-digit numbers			
Subtract 2-digits from 3-digits	Subtract two 4-digit numbers	Subtract whole numbers with more than 4-digits	
Subtract 3-digits from 3-digits			
Estimate answers to calculations and check	Estimate answers and check	Round to estimate and approximate Inverse to check	Mental calculations and estimations

Add and Subtract 1s, 10s, 100s & 1000s

2 ones and 3 ones is equal to 5 ones

2 tens and 3 tens is equal to 5 tens

So 2 hundreds and 3 hundreds is equal to .... hundreds

3456 + 1000=

7234 + 500 =

3821 + 700 =

8527 – 2000=

734 – 400=

6218 – 200=

715 + 50 =

4060 – 200 =

Column Addition

	H	T	O
			4 4 7
			+ 3 3 2

29	367

```
    3  6  7
 +     2  9
 _____
          1
```
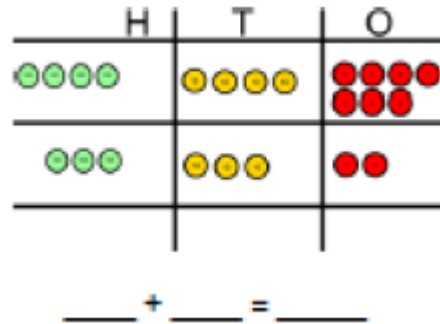
```
    4  4  7
 +  3  3  2
 _____
```

$$\_\_\_ + \_\_\_ = \_\_\_$$

Add the place value counters together.

1,000s	100s	10s	1s

```
    3  2  4  2
 +  2  2  1  3
 _____
```

```
   1 5 5 2 8
 +   2 7 1 3
 _____
     1     1
```
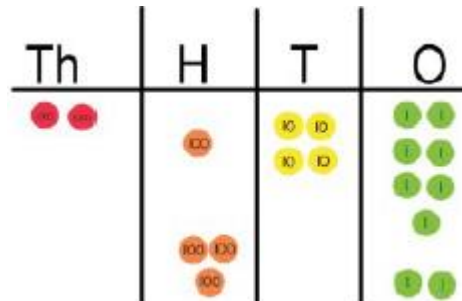
Th	H	T	O

Column Subtraction

607

607	
203	?

```
  6 0 7
-  2 0 3
  _____
```

Represent 235 – 29 using Base 10.

H	T	O

```
      2
  2 ⃠3̸ ¹5
 -   2 9
  _____
```

Thousands	Hundreds	Tens	Ones
7	6	4	6
4	3	3	5

45,536 – 8,426

Tth	Th	H	T	O

```
  4 7 6 1 3 2 5
-   9 3 8 0 5 2
  _____
```

Estimate

Estimate the position of arrows A and B on the number line.
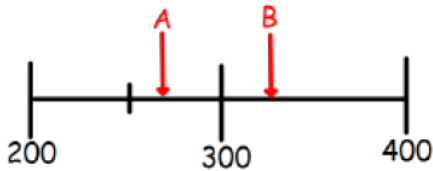
Match the calculations with a good estimate for the number sentence.

345 + 1,234	3,000 + 6,000
2,985 + 6,325	3,500 + 1,200
3,541 + 1,179	350 + 1,200
2,135 + 6,292	2,000 + 6,000

Which is the best question to estimate the following addition: 22223 + 5687

22220 + 5690
22230 + 5690
22220 + 5680

Which of these is a sensible estimation to the number of sweet in a jar?

.

602   597   600

What do you estimate that B represents when:
A = 0 and C = 1,000
A = 30 and C =150
A = -7 and C = 17
A = 0 and C = 5,000
A = 1,000 and C = 100,000

Inverse

When calculating 17,468 – 8,947, which answer gives the corresponding addition question?

- 8,947 + 8,631 = 17,468
- 8,947 + 8,521 = 17,468
- 8,251 + 8,947 = 17,468

I'm thinking of a number. After I add 5,241 and subtract 352, my number is 9485. What was my original number?

Multiplication and Division

Year 3	Year 4	Year 5	Year 6
Equal Groups		Multiples	Common Multiples
Multiply by 3, 4 & 8	Multiply by 0, 1, 6, 7, 9, 10, 11, 12 & 100,	Multiply by 10, 100 & 1000	
		Multiply up to 4-digits by 1-digit	Multiply 4-digits by 2-digits
		Multiply 2-digits	
		Multiply 3-digits by 2-digits	
		Multiply 4-digit by 2-digits	
Divide by 3, 4 & 8	Divide by 1, 6, 7, 9, 10, 11, 12 & 100,	Divide by 10, 100 & 1000	
		Divide up to 4-digits	Short Division
			Long Division
		Factors	Common Factors

Equal Groups

Describe the equal groups.
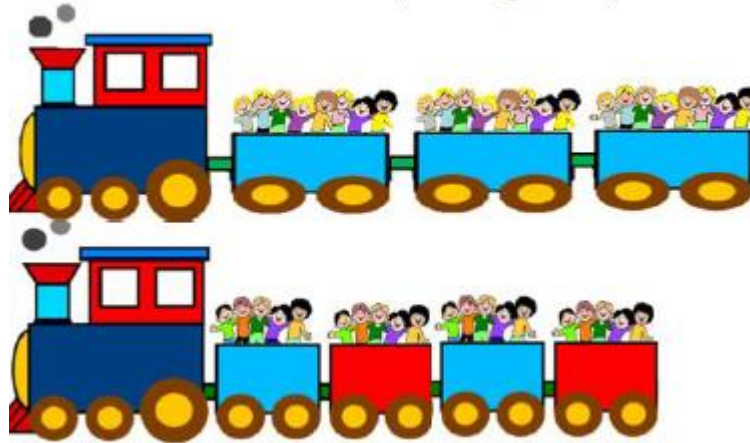
The image below shows six equal groups with five in each group. There are six 5s.
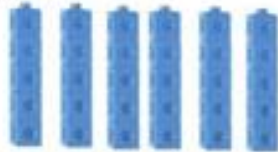
How else can you represent these equal groups?

Complete the sentences.

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

Multiples

Circle the multiples of 5.

25   32   54   40   175   3000

Common Multiples

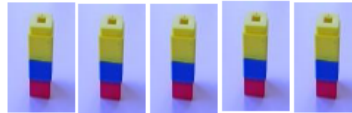On a 100 square, shade the first 5 multiples of 7 and then
the first 8 multiples of 5
What do you notice?
Choose 2 other times tables which you think will have
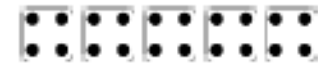more than 3 common multiples.

Multiply by 3, 4 & 8

There are five towers of 3 cubes.
How many cubes are there altogether?

_ + _ + _ + _ + _ =

_ × _ =

How many dots altogether?

There are __ dice with __ dots on each.
There are __ fours.
__ × __ = __ dots.

How many legs are there on four spiders?
_ + _ + _ + _ = _ × _ = _
There are __ legs on each spider.

Multiply by 0, 1, 6, 7 & 9

$0 = \boxed{} \times 42$

Complete the calculation shown by the Numicon.

There are ___ ones.   ___ × ___ = ___

$\boxed{} \times 27 = 0$

There is ___ six.   ___ × ___ = ___

Complete the sentences to describe the eggs.

There are __ lots of __.
There are seven _____.
$7 \times \underline{} = \underline{}$

Gemima uses number shapes to represent 7 times 4. She does it in two ways:

4 sevens
4 lots of 7
4×7

7 fours
7 lots of 4
7×4

Oranges are stacked in 9s.
Complete the sentences to describe the oranges:

There are _____ lots of 9
There are _____ nines
$4 \times \boxed{} = \boxed{}$

Multiply by 10, 100 & 1000

Match the statement to the correct bar model.

5 buses have 10 passengers.

10	10	10	10	10

8 pots each have 10 pencils.

5	5	5	5	5	5	5	5	5	5

10 chickens lay 5 eggs each.
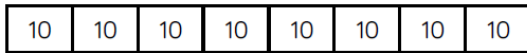
10	10	10	10	10	10	10	10

If $3 \times$ ▥ = ▥ ▥ ▥ = 3 ones = 3

Complete:

$3 \times$ ▮ = ▮▮▮ = ⬚ tens = ⬚

$3 \times$ ▦ = ▦▦▦ = ⬚ hundreds = ⬚

Make the number 234 on the place value grid using counters.

HTh	TTh	Th	H	T	O
			●●	●●●	●●●●

When I multiply my number by 10, where will I move my counters?

Remember when we multiply by 10, 100, 1000, we move the digits to the left and use zero as a place holder.

Written Multiplication

23 X 4

X	20	3
4	80	12

```
   8 0
+  1 2
  ____
```

```
   3 4 2
X        3
  _____
```

342 X 3

X	300	40	2
3	900	120	6

```
   9 0 0
   1 2 0
+      6
  _____
```

```
    96
    32  x
  _____
   192     ⇐ this is 96 x 2
  2880     ⇐ this is 96 x 30
  _____
  3072     ⇐ this is 96 x 32
```

Divide by 3, 4 & 8

There are 15 pieces of fruit. They are shared between 3 bowls equally. How many pieces of fruit in each bowl? Children use cubes to represent fruit and share between bowls.

$15 \div 3 =$ __

There are some cars in a car park.
Each car has 4 wheels.
In the car park there are 32 wheels altogether.
How many cars are there?

Pens are sold in packs of 8.
Year 3 need 48 pens.
How many packs should be ordered?

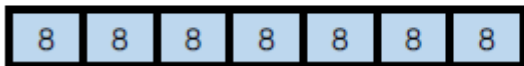# Divide by 1, 6, 7 & 9

Use counters and hands to complete:

- 4 counters **shared** between 4 hands $\Box \div \Box = \Box$

- 4 counters **shared** between 1 hand $\Box \div \Box = \Box$

- 9 counters **grouped** in 1s $\Box \div \Box = \Box$

- 9 counters **grouped** in 9s $\Box \div \Box = \Box$

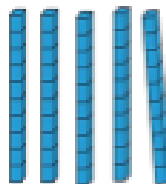At first there were __ eggs. Then they were shared into __ boxes. Now there are __ eggs in each box.

__ ÷ __ = __

Seven children share 56 stickers. How many stickers will they get each?

$56 \div 7 = \Box$

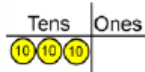| 8	8	8	8	8	8	8

Complete the fact family:

____ × ____ = ____

____ × ____ = ____

____ ÷ ____ = ____

____ ÷ ____ = ____

Divide by 10, 100 & 1000

Use place value counters to show the steps that you would take to divide 30 by 10

Tens	Ones
10 10 10	

Can you do this for a 3-digit number like 210?

Hundreds	Tens	Ones
100 100	10	

Match the calculation with the correct answer.

4,200 ÷ 10

4,200 ÷ 100

420 ÷ 10

420

42

HTh	TTh	Th	H	T	O
	●	● ●	● ● ●		

What number is represented in the place value grid?
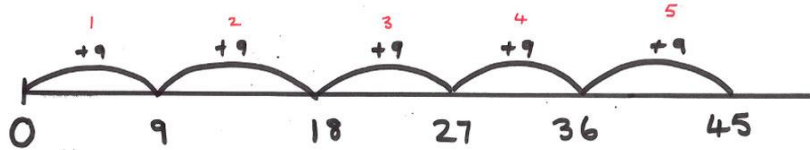
Divide the number by 100.

Which direction do the counters move?

How many columns do they move?

What number do we have now?

Written Division

$$45 \div 9 = 5$$

$$
\begin{array}{c|ccc}
 & 0 & 4 & 5 \\
\hline
8 & 3 & {}^3 6 & {}^4 0 \\
\end{array}
$$

$$
\begin{array}{c|ccc}
 & 1 & 3 & 7 \ r\ 5 \\
\hline
7 & 9 & {}^2 6 & {}^5 4 \\
\end{array}
$$

Long Division

$$3274 \div 13 = 251\ r\ 11$$

$$
13\overline{)3274}
$$

2600 (×200)
0674
650 (×50)
024
13 (×1)
11

13 × 10 = 130
13 × 5 = 65
13 × 20 = 260
13 × 100 = 1300
13 × 50 = 650
13 × 200 = 2600

$$3274 \div 13 = 251\ r\ 11$$

Times Tables Challenge

Times Table:	Time:
2	
8	
1	
12	
7	
3	
9	
5	
11	
4	
10	
6	

- Every day
- Against the clock
- Aim - fluency
- Times table test in Year 4

6m 37s	11		6m 11	12
4m 40	12		4m 15	12
7m 11	12		2m 55	12
3m 12	12		2m 28	11
2m 22s	12		2m 54	12
			2m 49	11
			2m 13	12
			1m 25	12