Warm up your brain while you wait...

Order these sets of numbers from smallest to largest:

9.9	9.09	9.099	9.99

6.56×10	665	1 tenth of 6556

-5.5	-5.05	-5.55	-5.055

0.12	13÷100	0.011

Hide Answers

Games

Ping Pong!

You begin by setting a rhythm where one person, i·e· the adult says ping and the children reply pong· You then start to give a number in place of ping and the children have to give the complement to 10 in place of pong, so it would go something like this 'ping, pong, ping, pong, six, four, ping, pong, five, five' etc·

Children really enjoy it and can actually hear themselves getting quicker at responding·

Expectations for Year 5 & Year 6

Please take a handout and familiarise yourself with these.

Number_Number and Place Value

- Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit
- Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000
- Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero
- Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 and 100,000
- Solve number problems and practical problems that involve all of the above
- Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.

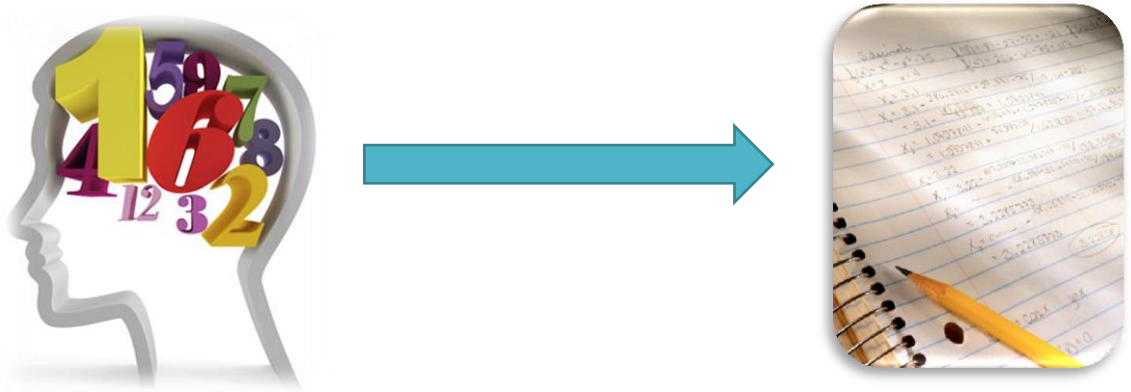
The Aim

- ✓ For children to do mathematics in their heads, and if the numbers are too large, to use pencil and paper to avoid losing track.

- ✓ To do this children need to learn quick and efficient methods, including mental methods and <u>appropriate</u> written methods.

Learning written methods is not the ultimate aim.

Mathematics is foremost an activity of the mind; written calculations are an aid to that mental activity.



Mental Methods

How can we work these out?

50 + 643

360 + 360

324 + 58

3.2 + 1.9

1.5 + 1.6

27 + 36 + 13

½ of 378

25 x 19

Did you:

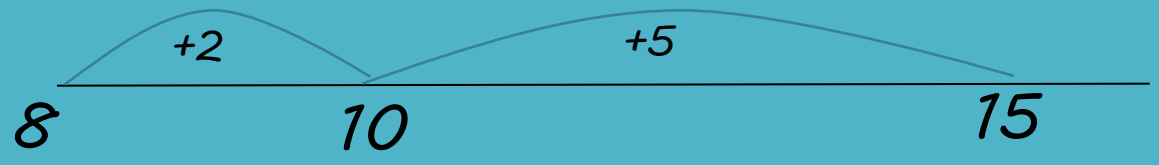
- count on from the largest number?
- re-order the numbers?
- partition the numbers into 100s 10s and ones?
- bridge through 10 and multiples of 10?
- add 9, 11 etc by adding a multiple of 10 and compensating?
- use near doubles?
- use knowledge of number facts?
- round up or down and adjust?

Number Facts

Children need to be able to recall other simple addition facts such as 4 + 5 and 8 + 9 and relate this to multiples of 10 and 100 (e.g. 40 + 50; 80 + 90).
These are secured through sufficient practice.

When learning to add numbers such as 8 + 7 or 26 + 7, they will learn to 'bridge through 10' to make adding quicker and more efficient. So they will make the first number add to the next 10, then add on what's left. For example,

For 8 + 7, they will do 8 + 2 = 10,
then add on the rest: + 5 = 15.



Rounding to 500

For each of these numbers, write five numbers that can be rounded to it when rounded to the nearest 500.

2000	3500	32 000	56 500

ANSWERS:

Between 1750 and 2249	Between 3250 and 3749	Between 31 750 and 32 249	Between 56 250 and 56 249

Explain the range of answers for 100 000.

ANSWER: Any number between 99 750 and 100 249

Instant recall facts

These are a key part of home learning and an easy way for you to help your child at home.

If they know these they will find the Maths much easier.

Maths

Key Instant Recall Facts

Year 5 - Autumn 1

I know decimal number bonds to 1 and 10.

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

Some examples:

0.6 + 0.4 = 1	3.7 + 6.3 = 10
0.4 + 0.6 = 1	6.3 + 3.7 = 10
1 – 0.4 = 0.6	10 – 6.3 = 3.7
1– 0.6 = 0.4	10 – 3.7 = 6.3
0.75 + 0.25 = 1	4.8 + 5.2 = 10
0.25 + 0.75 = 1	5.2 + 4.8 = 10
1 – 0.25 = 0.75	10 – 5.2 = 4.8
1 – 0.75 = 0.25	10 – 4.8 = 5.2

Key Vocabulary

What do I **add** to 0.8 to make 1?

What is 1 **take away** 0.06?

What is 1.3 **less than** 10?

How many more than 9.8 is 10?

What is the **difference** between 0.92 and 10?

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?

九九乘法口诀表

乘宝宝系列丛书

1

1×1=1
1×2=2
1×3=3
1×4=4
1×5=5
1×6=6
1×7=7
1×8=8
1×9=9

2

2×2= 4
2×3= 6
2×4= 8
2×5=10
2×6=12
2×7=14
2×8=16
2×9=18

3

3×3= 9
3×4=12
3×5=15
3×6=18
3×7=21
3×8=24
3×9=27

4

4×4=16
4×5=20
4×6=24
4×7=28
4×8=32
4×9=36

5

5×5=25
5×6=30
5×7=35
5×8=40
5×9=45

6

6×6=36
6×7=42
6×8=48
6×9=54

7

7×7=49
7×8=56
7×9=63

8

8×8=64
8×9=72

9

9×9=81

6.80

What's next?

- It is only once the children are confident in these mental strategies that they begin to look at more formal written methods.

- As they move through KS2, the children are taught a number of techniques, initially expanding on their mental strategies before progressing towards an efficient and more compact written method.

Place Value

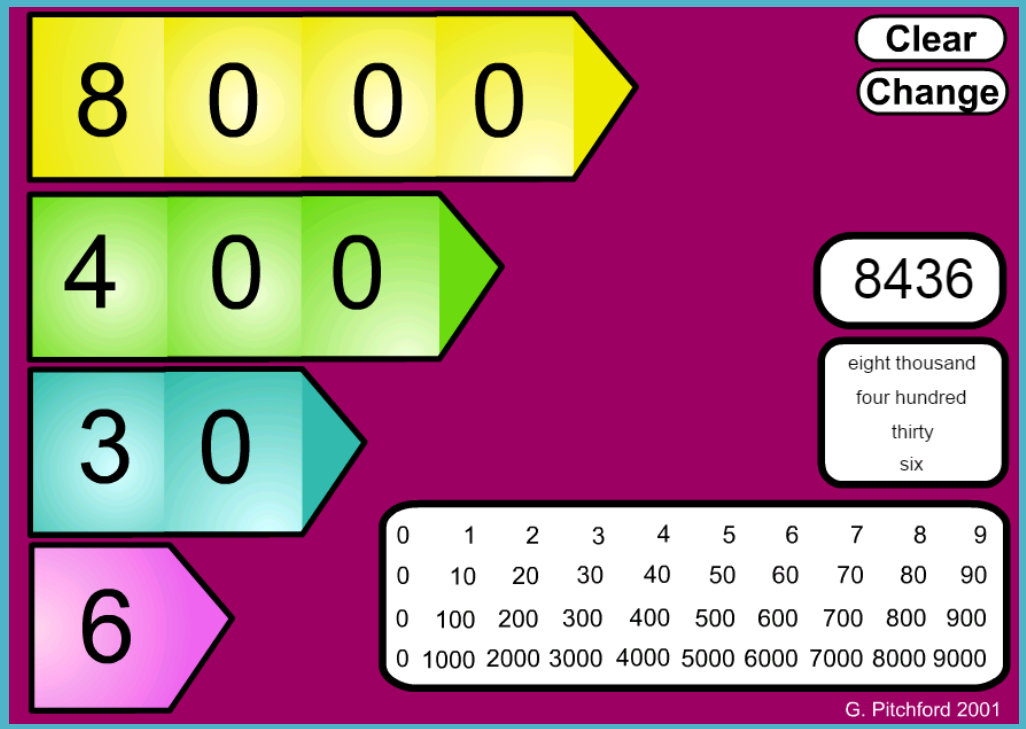
It is also crucial that children gain an understanding of place value (how much each digit in a number is worth) and how to partition a number into its parts. This helps the children manage numbers and calculations more easily.

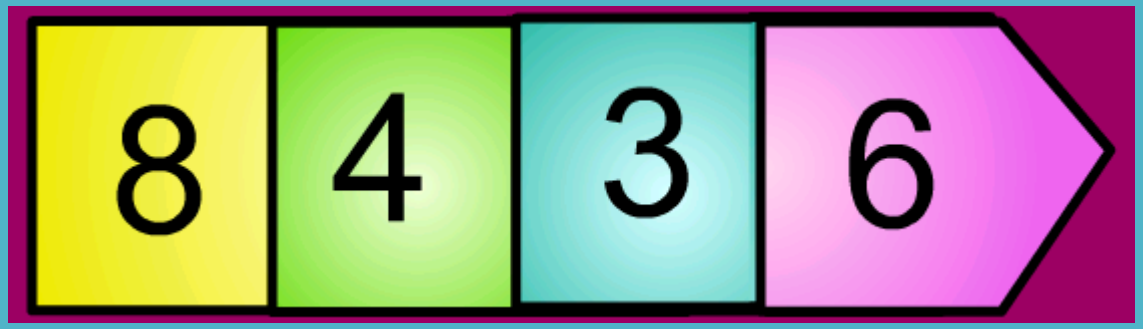
For example: 256,723
200,000 + 50,000 + 700 + 20 + 3

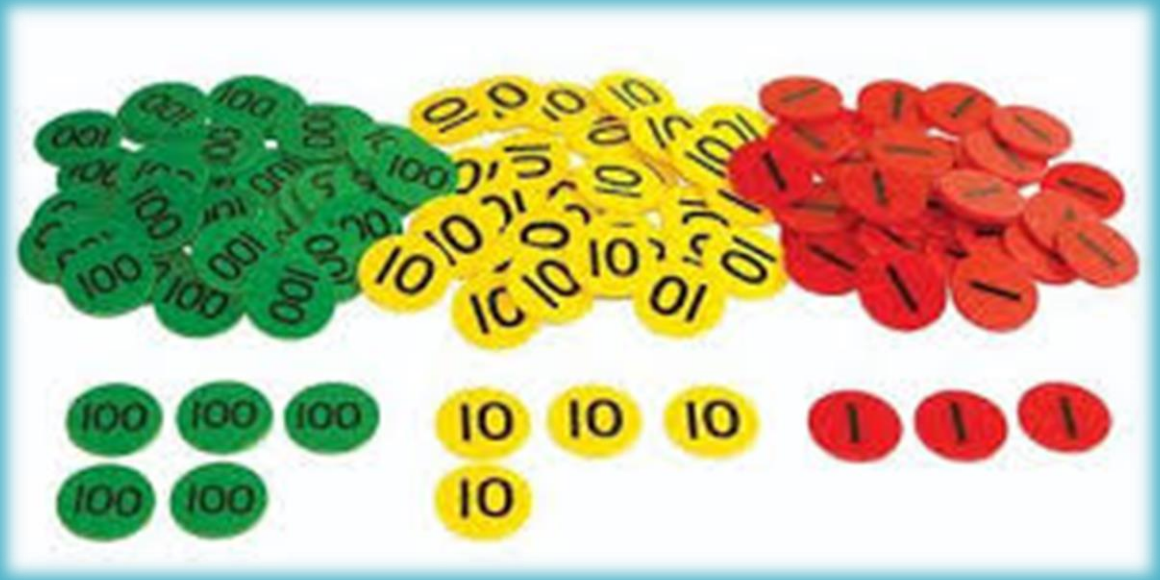
They can then use their knowledge of place value to extend known number facts – e.g. using the fact that 3 x 6 = 18 to calculate 30 x 6 = 180, or 300 x 6 = 1,800 etc.

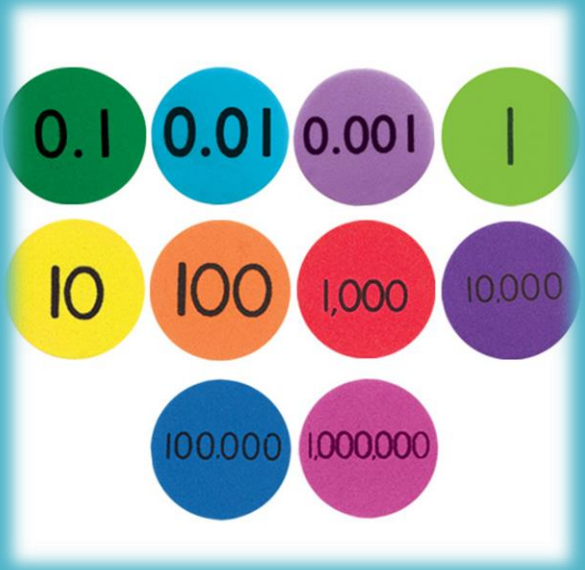
Place Value

Representations to support understanding

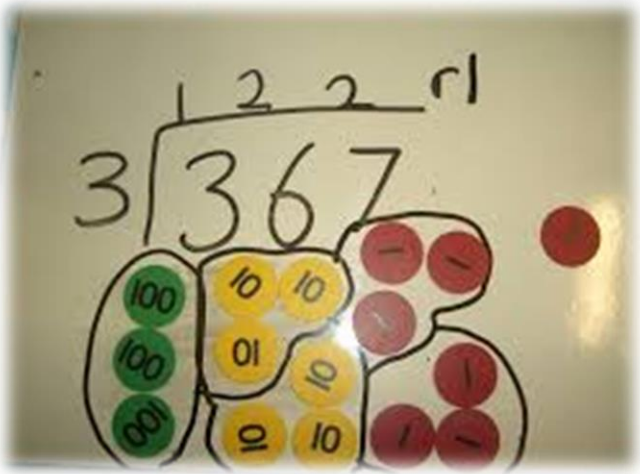


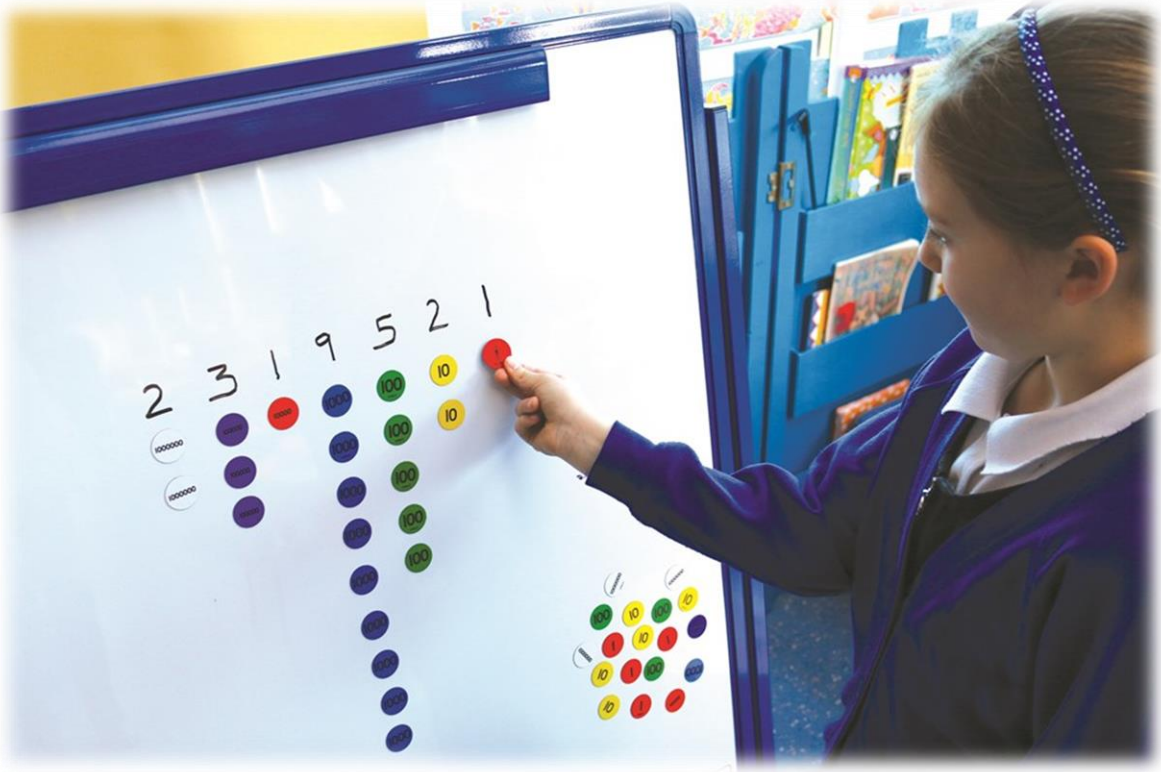


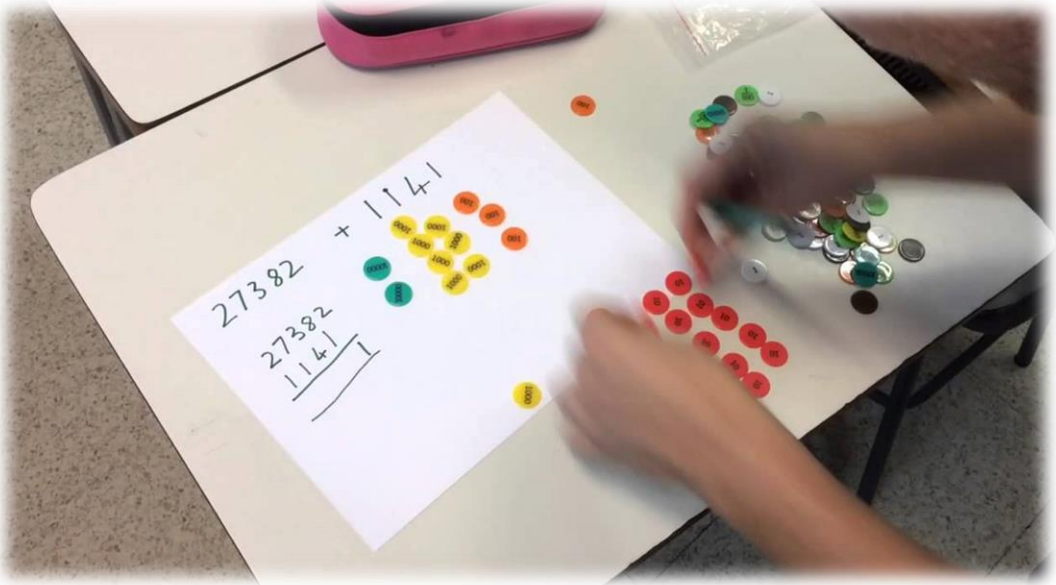

100
10
1


0.1
0.01
0.001
1
10
100
1,000
10,000
100,000
1,000,000


263 - 119 =
1000
100
10
1
3
9
1
1
tens
ones


122 r1
3 367


2 3 1 9 5 2 1


27382 + 1141
27382
1141

Place Value

M	Hth	Tth	Th	H	T	O	t	h	th
Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths
1 000 000	100 000	10 000	1000	100	10	1	0.1	0.01	0.001

Multiplying and Dividing by 10, 100 and 1000

10 000	1000	100	10	1	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
				●			

Multiplying

X 10	digits move LEFT **1** space
X 100	digits move LEFT **2** spaces
X 1000	digits move LEFT **3** spaces

Dividing

÷ 10	digits move RIGHT **1** space
÷ 100	digits move RIGHT **2** spaces
÷ 1000	digits move RIGHT **3** spaces

1	2	3	4	5	6	7	8	9
10	20	30	40	50	60	70	80	90

1	2	3	4	5	6	7	8	9
10	20	30	40	50	60	70	80	90
100	200	300	400	500	600	700	800	900

1	2	3	4	5	6	7	8	9
10	20	30	40	50	60	70	80	90
100	200	300	400	500	600	700	800	900
1 000	2 000	3 000	4 000	5 000	6 000	7 000	8 000	9 000

Let's take our finger for a walk!

Year 5 example questions

87 000

It is 3000 less than 90 000.

It is 13 000 less than 100 000.

It is made of 87 thousands.

It is made of 870 hundreds.

Count backwards in ten thousands. Write the 6th, 7th and 8th numbers to which you come.

27 000, 17 000, 7 000

What would happen if you wrote the number with Roman Numerals?

$\overline{\text{LXXXV}}$MM

Write a similar set of questions for a partner.

Hide Answers

Year 6 example questions

Order

Explain how to order the following numbers from smallest to largest:

1 010 011 **1 100 010** **1 101 001** **1 001 100**

1 001 010 **1 101 011** **110 110**

- 110 110 is the smallest as it is the only number with 6 digits. The rest have 7 digits.
- 1 001 010 and 1 001 100 are the next smallest numbers. They both have the same total number of thousands, but the former is smaller as the last three digits are 010 and the latter is 100.
- The next number is 1 010 011 as it has no hundred thousands.
- The largest three numbers are 1 100 010, 1 101 001, 1 101 011. All have ones in the millions and hundred thousands. The first of these is the smallest as is has no thousands, but the others do. The third one is the largest as all the digits are the same as the second one except is has a ten and the middle one has no tens.

Hide Answers

Let's do some Maths!

Some example questions...

Counting and Place Value

Place value

(a) Which number below is **four thousand and seven**?

Put a ring round it.

47 407 4007

40007 400007

1 mark

(b) Write in figures the number **three million**.

.....

1 mark

A. Can you squash these numbers together to make one number and then write the number in words? Use this place value chart and a rubber or draw your own place value chart to help you.

e.g. 10 000, 60, 5 000 000, 9, 400 000 = 5 410 069

Five million four hundred and ten thousand and sixty nine

1. 7, 8000, 90, 3 000 000 =

2. 60 000, 70, 4 000 000, 900 000, 500 =

3. 30, 600, 7, 400 000, 70 000 =

4. 8 000 000, 100 000, 60 000, 200, 2, 60 =

Place Value 6-Digit Number Challenge

Write a single-digit number in each star.

What is the...	
largest 6-digit number you can make?	
smallest 6-digit number you can make?	
largest odd 6-digit number?	
largest even 6-digit number?	
smallest odd 6-digit number?	
smallest even 6-digit number?	
largest 6-digit number rounded to the nearest 10?	
largest 6-digit number rounded to the nearest 100?	
largest 6-digit number rounded to the nearest 1000?	
largest 6-digit number rounded to the nearest 10 000?	
smallest 6-digit number rounded to the nearest 10?	
smallest 6-digit number rounded to the nearest 100?	
smallest 6-digit number rounded to the nearest 1000?	
smallest 6-digit number rounded to the nearest 10 000?	

ADDITION

Key Words

total come increase

both altogether

sum plus combine

in all add join

Stage 3: Column Method

Expanded

358
+ 33

11
80
300

391

Leading to →

Compact

358
+ 33

391
1

Column Addition

https://www.youtube.com/watch?v=6HstkNu2baI

SUBTRACTION

Key Words

Take away

decrease

remain

difference

minus

How many more?

fewer

left

Stage 4: Column Method

$$\begin{array}{r} 547 \\ -\ 134 \\ \hline 413 \end{array}$$

$$\begin{array}{r} {}^{3}\not{4}\,{}^{1}3 \\ 27 \\ \hline 16 \end{array}$$

A sledgehammer to crack a nut!

$$\begin{array}{r} {}^{0}\cancel{1}\,{}^{1}\cancel{0}\,{}^{1}\cancel{0}\,{}^{1}0 \\ -\quad\quad 7 \\ \hline 9\,9\,3 \end{array}$$

$$\begin{array}{r} {}^{1}\cancel{1}6^{\,0} \\ -\;\;9 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 97 \\ \times\;100 \\ \hline 00 \\ 000 \\ 9700 \\ \hline 9700 \end{array}$$

$$\begin{array}{r} 0\,8 \\ \hline 7\overline{)\,{}^{0}\cancel{5}\,{}^{5}6} \end{array}$$

Column Subtraction

https://www.youtube.com/watch?v=qyH6cPu23SI

Multiplication

per

of

multiplied

product

twice

double

by

as much

times

Stage 3: Partitioning

24 x 5

20 x 5 = 100
4 x 5 = 20

100 + 20 = 120

Step 4: Grid Method

Multiplying TU x TU

14 x 33

	30	3
10	300	30
4	120	12

= 330 +

= 132

462

BBC News Video Link

Use the grid method to work these out:

24 x 7

142 x 3

14 x 33

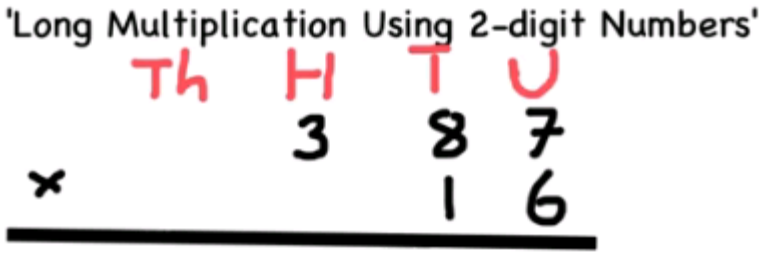
	30	3	
10	300	30	= 330 +
4	120	12	= 132
			462

Step 5: Short multiplication

https://www.youtube.com/watch?v=p2Fi43jZOqI

Step 5: Long multiplication

https://www.youtube.com/watch?v=RVYwunbpMHA



Division

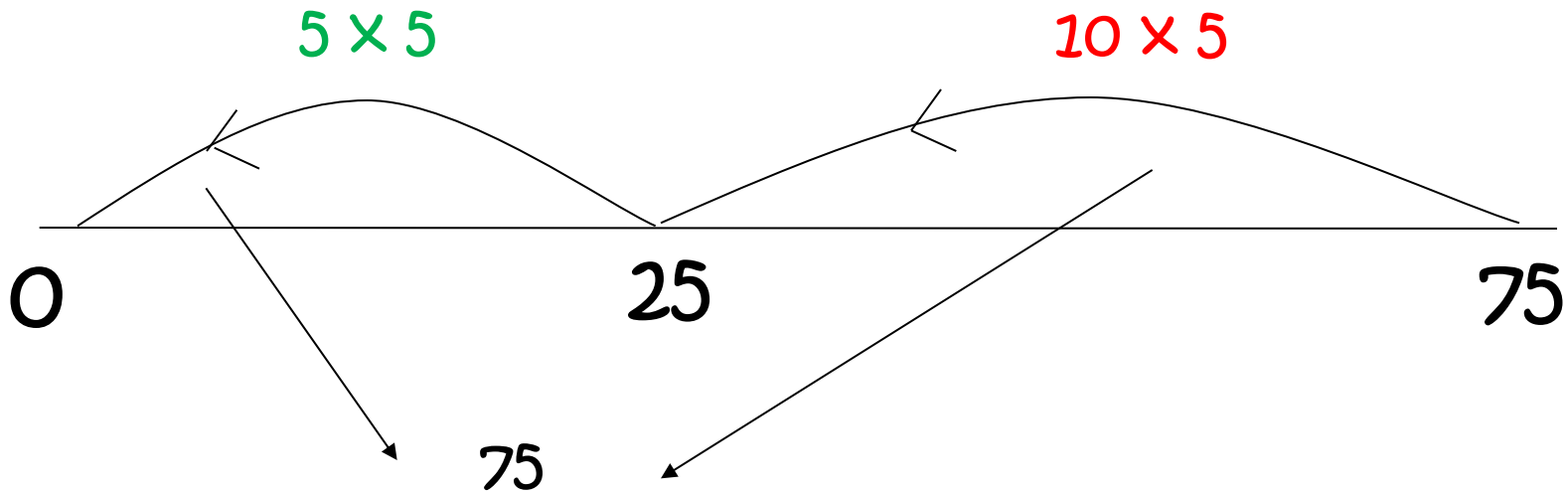
cut	each
evenly	Every
Quotient	out of
equal parts	divided by
In half	average

How would you solve these?

- 123 ÷ 3
- 165 ÷ 10
- 325 ÷ 25
- 623 ÷ 24

Step 4: Chunking/grouping

75 ÷ 5



75
- 50 (10 X 5)
25
- 25 (5 X 5)
0

75 ÷ 5 = 15

Need to know tables!

BBC News Video Link

Children need to see that as the numbers get larger, large chunk subtraction is the more efficient method. Multiples of the divisor (large chunks) are taken away. Multiplication facts are needed to see the size of the 'chunk'.

What facts do I know about the 7 times-table?

100 ÷ 7 = 14 r 2

100

- 70 (10 x 7)

30

- 28 (4 x 7)

2

518 ÷ 7 = 74

518

- 350 (50 x 7)

168

- 140 (20 x 7)

28

- 28 (4 x 7)

0

Fact Box

1 x 7 = 7

2 x 7 = 14

5 x 7 = 35

10 x 7 = 70

20 X 7 = 140

50 x 7 = 350

100 x 7 = 700

https://www.youtube.com/watch?v=KGMf314LUc0

Stage 5: Short Division

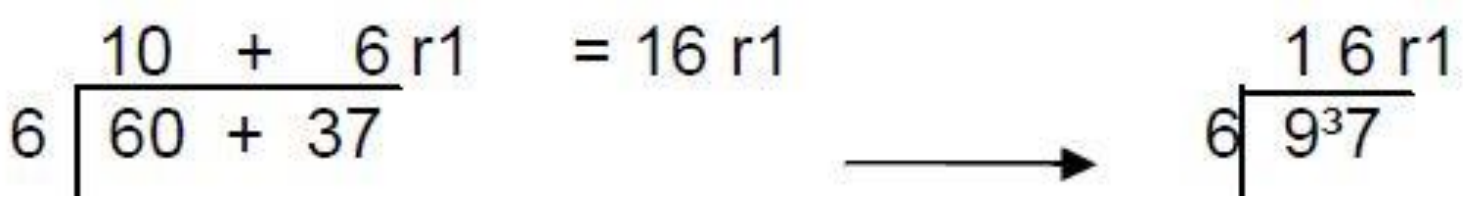
For example: 84 ÷ 7 can be partitioned into (70 + 14) ÷ 7
This can now be calculated: 70 ÷ 7 = 10
14 ÷ 7 = 2 Therefore 84 ÷ 7 = 12

Another example: 104 ÷ 8 = (80 + 24) ÷ 8
80 ÷ 8 = 10
24 ÷ 8 = 3 Therefore 104 ÷ 8 = 13

Remainders may also sometimes need to be recorded:
97 ÷ 6 = (60 + 37) ÷ 6
90 ÷ 6 = 10
37 ÷ 6 = 6 r1 Therefore 97 ÷ 6 = 16 r1

Stage 5: Short Division

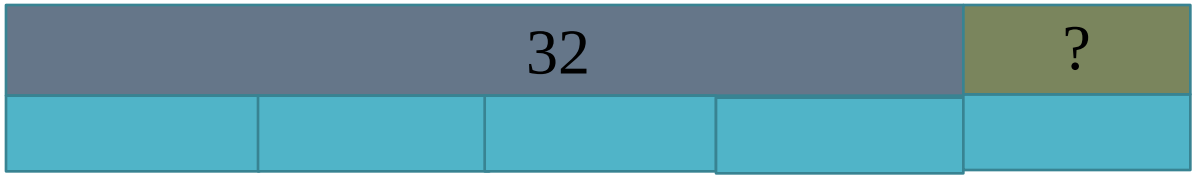
The short division method can be recorded like this:



https://www.youtube.com/watch?v=Hs4WaZU5Cw8

Bar Model

Annie answered 4/5 of the questions on the test. She answered 32. How many questions were on the test?



A Super Mario Game costs £45, it is reduced in price by 25%, how much does it cost now?

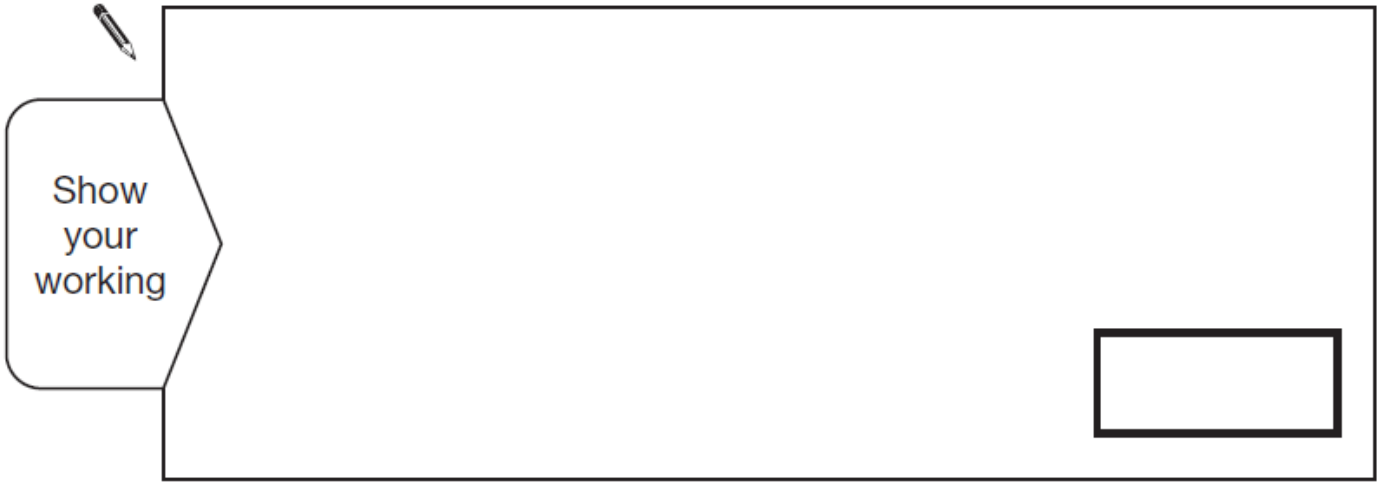
=100%

Use the bar model to help solve the following problem:

24 In a class, 18 of the children are girls.

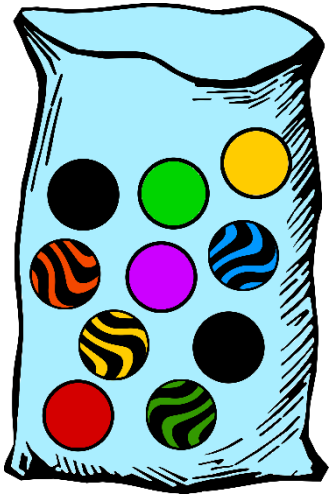
A quarter of the children in the class are boys.

Altogether, how many children are there in the class?

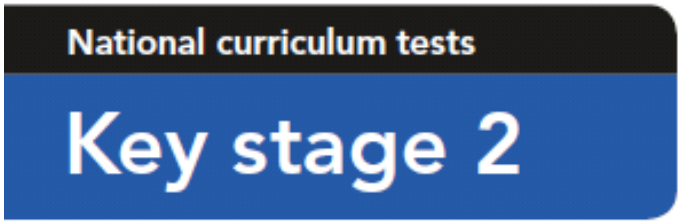


Sam had 5 times as many marbles as Tom. If Sam gives 26 marbles to Tim, the two friends will have exactly the same amount.

How many marbles do they have altogether?



New 2016 SATS papers



Mathematics

Paper 1: arithmetic

First name						
Middle name						
Last name						
Date of birth	Day		Month		Year	
School name						

Rounding and Negative Numbers

Round the following numbers.

540 to the nearest 100 ☐

236 to the nearest 10 ☐

$1\frac{3}{4}$ to the nearest whole number ☐

2 marks

Factors and multiples

Here is a sorting diagram with four sections, **A**, **B**, **C** and **D**.

	multiple of 10	not a multiple of 10
multiple of 20	**A**	**B**
not a multiple of 20	**C**	**D**

Write a number that could go in section **C.**

1 ma

Section **B** can never have any numbers in it.

Explain why.

Multiply and Divide

Dev has a bag of 50p coins and Holly has a bag of 20p coins.

Dev's bag

Holly's bag

Both bags have the same amount of money in.

There are **thirty** 50p coins in Dev's bag.

How many 20p coins are there in Holly's bag?

Show your **method.** You may get a mark.

20p coins

2 marks

Decimals and Fractions

Write in the missing numbers.

One is done for you.

$0.321 = \frac{321}{1000}$ $\qquad 2.433 = \frac{\square}{1000}$

$\square = \frac{457}{1000}$ $\qquad \square = \frac{23}{1000}$

2 marks

Calculate $\frac{3}{8}$ of **980**

1 mark

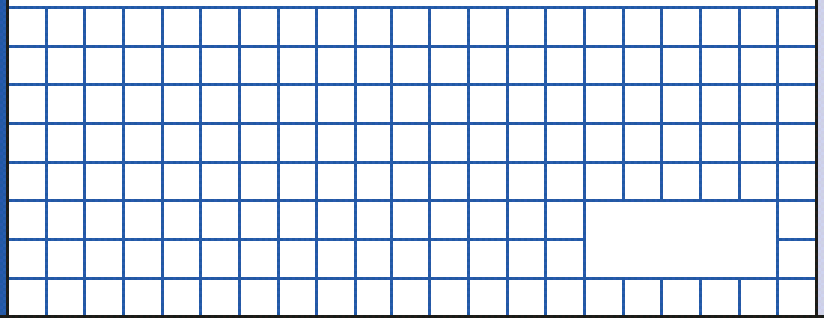
Arithmetic Paper

- The arithmetic paper accounts for over one-third of the marks available, replacing the emphasis on mental arithmetic from the old Key Stage 2 tests.
- These test papers focus on questions relating to the number, calculations and fractions strands of the new National Curriculum. Each question is presented as a context-free calculation using only digits and symbols. No equipment other than pen, pencil, ruler and rubber are permitted for this test.

Arithmetic Paper

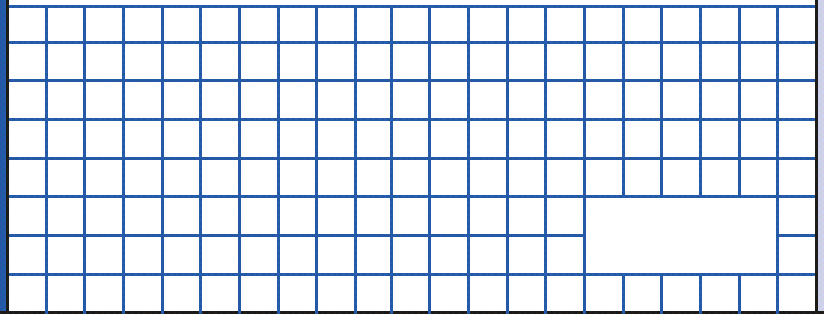
- The paper is designed to assess the range of mathematical operations. There are around 35-38 questions, with most worth 1 mark. Several of the early questions invite pupils to use mental strategies (such as 979 + 100, or 6·1 + 0·3).
- Children will have 30 minutes to complete the paper.
- Throughout the paper, challenge is increased with the introduction of larger numbers, or increasing numbers of decimal places, and the introduction of more complex fraction calculations.
- Questions requiring long multiplication or division are worth 2 marks, with 1 mark being available for the use of a standard method with only one calculation error. These questions are presented using the standard column or 'bus stop' layouts to guide pupils to use these forms.
- All questions are presented with a 7mm squared grid working area for children to use if they wish.

1 979 + 100 =



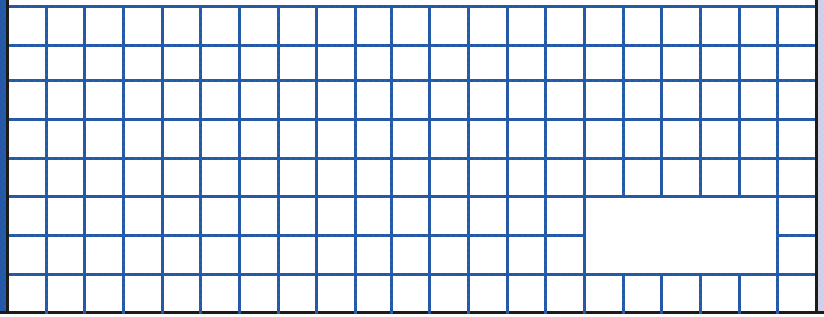
1 mark

2 123 × 2 =



1 mark

3 6.1 + 0.3 =



1 mark

The Mathematical Reasoning Papers

Tests include papers which require children to demonstrate their use of mathematical fluency to solve problems both in and out of context. These papers draw on the full spectrum of the new National Curriculum programmes of study for mathematics, although there remains a focus on the number elements.

There's a good deal of work to be done in the coming year for pupils in Year 6 to ensure that they are well prepared for the tests. Here are some of our tips for helping your child:

Top Tips

✔✔ Ensure that children are confident with the relevant addition bonds and multiplication tables.

✔✔ Practise written methods of calculation regularly to ensure that children can use them quickly and confidently.

✔✔ Continue mental maths practice: many of the skills taught for the old mental maths paper are great

for practising fluency and recall for all sorts of questions and tasks.