
















SMUPS Maths Learning Organiser

Year 6

<p>Yearly Progression:</p> 	<p>Autumn 1</p> <p>Number: Place Value</p> <p>Number: Addition, Subtraction, Multiplication & Division</p>	<p>Autumn 2</p> <p>Number: Fractions A</p> <p>Number: Fractions B</p> <p>Measurement: Converting Units</p>	<p>Spring 1</p> <p>Number: Ratio</p> <p>Number: Algebra</p> <p>Number: Decimals</p>	<p>Spring 2</p> <p>Number: Fractions, decimals and percentages</p> <p>Measurement: Area, perimeter and volume</p> <p>Statistics</p>	<p>Summer 1</p> <p>Geometry: Properties of shape</p> <p>Geometry: Position and Direction</p>	<p>Summer 2</p> <p>Consolidation and themed projects</p>				
<p>Home Learning:</p>			<p>To find out home to access the Home Learning section from, please watch our YouTube video link.</p> <p>Home learning lessons follow the White Rose, Lesson by Lesson Progression like in school. Please click below to see,</p> <p>https://whiterosemaths.com/resources/primary-resources/primary-sols/</p> <p>For weekly home learning please click the link below, and then chose the correct unit of work for the term.</p> <p>https://whiterosemaths.com/homelearning/year-6/</p> 							
<p>Links to wider curriculum:</p>	<ul style="list-style-type: none"> • History- Links with Ancient Greece topic- building the Trojan Horse in D, ordering events • Geography – Measuring, recording, and analysing tables and graphs • Science- Measuring, recording, and analysing tables and graphs • Computing 									
<p>Number Talk Key Skills</p>	<table style="width: 100%; text-align: center;"> <tr> <td data-bbox="448 938 672 1260"> <p><u>Instigator</u></p>  <p>I think because</p> <p>I know that</p> <p>I noticed</p> <p>Today, we are talking about...</p> </td> <td data-bbox="694 938 918 1260"> <p><u>Contributor</u></p>  <p>I agree/disagree with ... because...</p> <p>I like your idea but....</p> </td> <td data-bbox="940 938 1164 1260"> <p><u>Prober</u></p>  <p>What do you think</p> <p>I think differently because...</p> </td> <td data-bbox="1187 938 1366 1260"> <p><u>Summariser</u></p>  <p>We talked about....</p> <p>We found that....</p> <p>We agreed that....</p> </td> </tr> </table>				<p><u>Instigator</u></p>  <p>I think because</p> <p>I know that</p> <p>I noticed</p> <p>Today, we are talking about...</p>	<p><u>Contributor</u></p>  <p>I agree/disagree with ... because...</p> <p>I like your idea but....</p>	<p><u>Prober</u></p>  <p>What do you think</p> <p>I think differently because...</p>	<p><u>Summariser</u></p>  <p>We talked about....</p> <p>We found that....</p> <p>We agreed that....</p>	<p>Facts for free- making links between number facts and number bonds.</p> <p>Draw on simple conclusions from understanding of work. Predict what might come next.</p> <p>Use manipulatives and images to explain and give reasons.</p> <p>Justify using work examples What went well? Even better if...</p> <p>Use and choose suitable manipulatives and visual representatives including the bar model..</p>	
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Number: Addition and Subtraction

National Curriculum

- Pupils should be taught to:
- add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
- add and subtract numbers mentally with increasingly large numbers
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Teaching Spine



- Composition and calculation: numbers up to 10,000,000
- Problems with two unknowns

Efficient Methods that we will use...(Please see calculation policy)

- Bar models
- Part whole models
- Partitioning
- Rounding and compensation
- Column method
- Number line
- Counting on for subtraction

Examples of Greater Depth...

Jasmine and Kamal have been asked to work out $5748+893$ and $5748-893$. Jasmine says '893 is 7 less than 900, and 900 is 100 less than 1000, so I can work out the addition by adding 1000 and then taking away 7.' What answer does she get and is she correct?

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

The numbers shown are the totals of the line of four numbers in the row or column.

▲	♣	▲	●	
♣	●	♣	▲	25
●	●	●	●	20
▲	♣	♣	▲	
				26

Find the remaining totals.

Can you use five of the digits 1 to 9 to make this number sentence true?

$$\square \square \cdot \square + \square \cdot \square = 31.7$$

Can you find other sets of five of the digits 1 to 9 that make the sentence true?

x and y represent whole numbers. Their sum is 1000.

Can the difference between x and y be:

- 100?
- any whole number?
- greater than x ?

Important Images...

Number: Multiplication and Division

National Curriculum

- Pupils should be taught to:
- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the
- formal written method of long multiplication
- divide numbers up to 4 digits by a two-digit whole number using the formal written
- method of long division, and interpret remainders as whole number remainders,
- fractions, or by rounding, as appropriate for the context
- divide numbers up to 4 digits by a two-digit number using the formal written method
- of short division where appropriate, interpreting remainders according to the context

Teaching Spine



- Multiplication strategies for larger numbers and long multiplication
- Division: dividing by two-digit divisors
- Using compensation to calculate
- Mean average and equal shares
- Scale factors, ratio and proportional reasoning
- Combining division with addition and subtraction
- Decimal place-value knowledge, multiplication and division
- Multiplicative contexts: area and perimeter 2

Efficient Methods that we will use... (Please see calculation policy)

- Using formal long multiplication method
- Using formal short division method (bus stop)
- Using formal long division method

Examples of Greater Depth...

A machine pours 250 millilitres of juice every 4 seconds. How many litres of juice does the machine pour every minute?

A bus company has 62 minibuses.

On average, each minibus travels 19 miles on a gallon of fuel and goes 284 miles each day.

The Company says it needs about 1000 gallons of fuel every day. Approximate these numbers and make an estimate to show whether what the company says is about right.



A 5p coin has a diameter of 1.8 centimetres. Holly makes a straight line of 5p coins worth £10

How long is Holly's line?
Give your answer in **metres**.

Important Images...

		0	3	6		
1	2	4	3	2		
		-	3	6	0	
				7	2	
				-	7	2
						0

(x30)

(x6)

12 × 1 = 12
12 × 2 = 24
12 × 3 = 36
12 × 4 = 48
12 × 5 = 60
12 × 6 = 72
12 × 7 = 84
12 × 8 = 96
12 × 9 = 108
12 × 10 = 120

$$432 \div 12 = 36$$

$$7,335 \div 15 = 489$$

	0	4	8	9			
15	7	3	3	5			
	-	6	0	0	0		
		1	3	3	5		
		-	1	2	0	0	
				1	3	5	
				-	1	3	5
							0

(x400)

(x80)

(x9)

1 × 15 = 15
2 × 15 = 30
3 × 15 = 45
4 × 15 = 60
5 × 15 = 75
10 × 15 = 150

TTh	Th	H	T	O		
	2	7	3	9		
x			2	8		
	2	1	9	1	2	
	1	5	4	7	8	0
		7	6	6	9	2
						1
						76,692

Fractions Decimals and Percentages

National Curriculum

- Pupils should be taught to:
- use common factors to simplify fractions; use common multiples to express fractions in the same denomination
- compare and order fractions, including fractions > 1
- add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
- multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $4 \frac{1}{2} \times 2 \frac{1}{2} = 8 \frac{1}{2}$]
- divide proper fractions by whole numbers [for example, $3 \frac{1}{2} \div 2 = 6 \frac{1}{2}$]
- associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$]
- identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places
- multiply one-digit numbers with up to two decimal places by whole numbers
- use written division methods in cases where the answer has up to two decimal places
- solve problems which require answers to be rounded to specified degrees of accuracy
- recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

Teaching Spine



Teaching point 1: When a fraction is multiplied by a proper fraction, it makes it smaller. To multiply two fractions, multiply the numerators and multiply the denominators.

Teaching point 2: When a fraction is divided by a whole number, it makes it smaller. To divide a fraction by a whole number, convert it to an equivalent multiplication.

Teaching point 3: A more efficient method can be used to divide a fraction by a whole number when the whole number is a factor of the numerator.

Teaching point 1: Some fractions are easily converted to decimals.

Teaching point 2: These fraction–decimal equivalents can be found throughout the number system.

Teaching point 3: Fraction–decimal equivalence can sometimes be used to simplify calculations.

Teaching point 4: 'Percent' means number of parts per hundred. A percentage can be an operator on a quantity, indicating the proportion of a quantity being considered.

Teaching point 5: Percentages have fraction and decimal equivalents.

Teaching point 6: If the value of a whole is known, a percentage of that number or amount can be calculated.

Efficient Methods that we will use... (Please see calculation policy)



$$\frac{3}{4} \times \frac{1}{3} = \frac{3}{12} = \frac{1}{4}$$

$$\frac{1}{4} \div 2 = \frac{1}{8} \rightarrow \frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$$

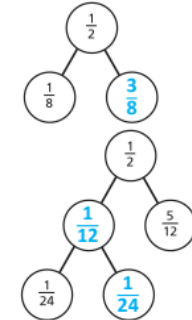
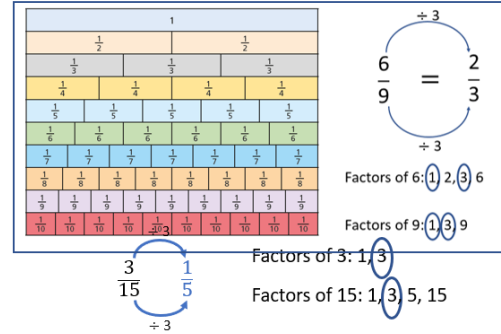
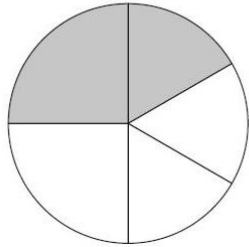
$$\frac{7}{12} - \frac{1}{4} =$$

$$\frac{7}{12} + \frac{1}{4} = \frac{10}{12} = \frac{5}{6}$$

Examples of Greater Depth...

Important images

In this circle, $\frac{1}{4}$ and $\frac{1}{6}$ are shaded.



Number and Place Value

National Curriculum

- read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
- round any whole number to a required degree of accuracy
- use negative numbers in context, and calculate intervals across zero
- solve number and practical problems that involve all of the above.



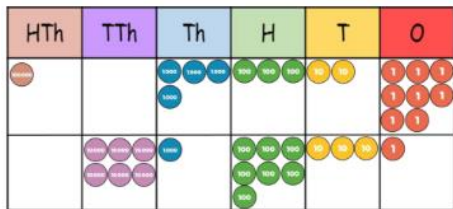
NCETM

NATIONAL CENTRE FOR EXCELLENCE
IN THE TEACHING OF MATHEMATICS

Teaching Spine

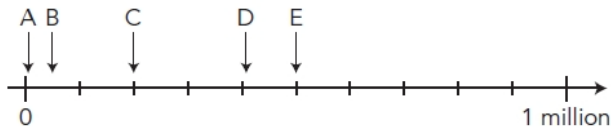
Not applicable

Efficient Methods that we will use... (Please see calculation policy)



Using place value grids to help order numbers.

Examples of Greater Depth...



Write the letter of the arrow that points to the number 50 000

Fill in the missing numbers.

7,730,004	a	7,930,004	8,030,004	b	8,230,004	c	8,430,004
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Important images

1,000	100	10	1	•	0.1	0.01
thousands	hundreds	tens	ones	decimal point	tenths	hundredths
				•		

Precision Maths:

- Fluent recall of times and tables and division tables
- Fast recall of factors and multiples
- Speed practise of methods
- Practicing multiplying and dividing by 10,100 and 1000
- Squared and cubed numbers
- Mentally add and subtract numbers using efficient methods eg rounding, bridging through 10,100,100, partitioning numbers
- Quick mental recall of number bonds and upscaling these through 10,100 and 1000 times better
- Doubling and halving, near doubles
- Perimeter
- Counting in decimals, fractions, larger multiples over boundaries
- Rounding to next/ nearest ten, hundred, thousand, one
- Finding 10% and 5% of number- extend to simple multiples
- Counting in negative numbers
- Finding equivalent fractions
- Finding equivalents between fractions, decimals and percentages
- Ordering FDP on a number line
- Counting in fractions decimals and percentages
- Finding simple percentages using multiples of 5 and 10