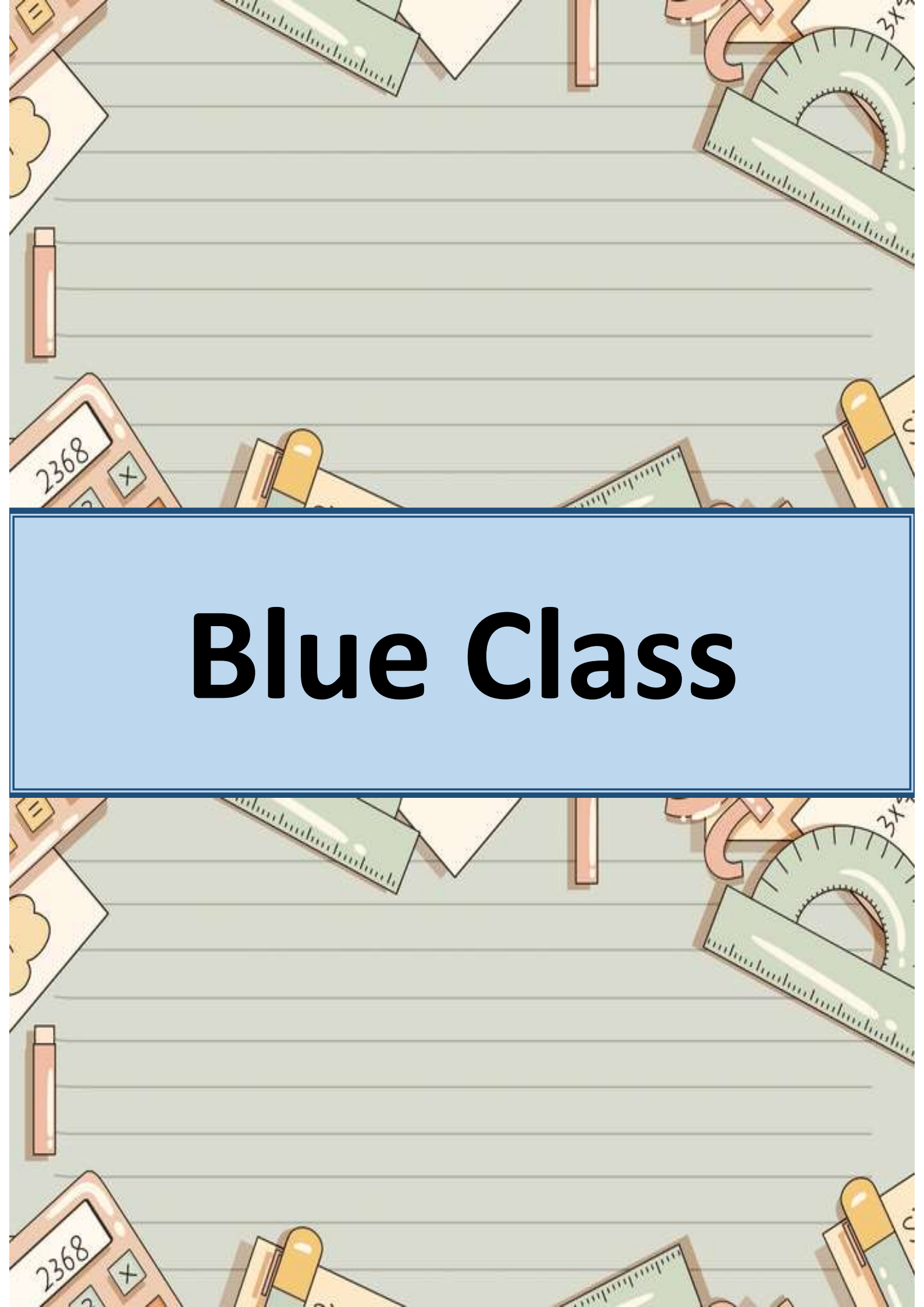
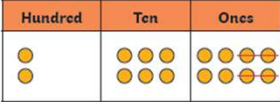
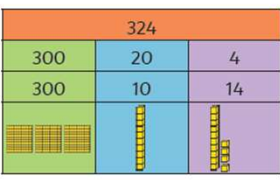
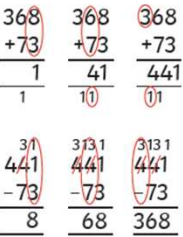
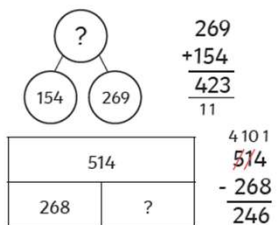
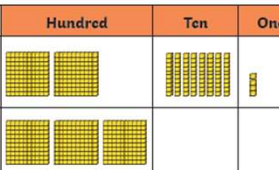
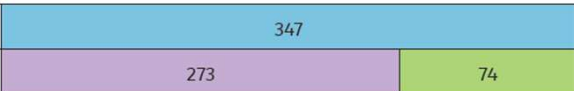
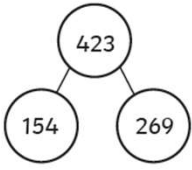


The background of the page is a light gray surface with horizontal lines, resembling a notebook. It is decorated with various school supplies: a green ruler, a protractor, a calculator showing '2368', a pencil, a paperclip, and a small notepad with a cloud drawing. These items are scattered around the edges of the page.

Blue Class

Addition and Subtraction: Stage 3

Addition and Subtraction		Knowledge Organiser	
Key Vocabulary add total plus sum more altogether difference subtract less minus take away column addition column subtraction exchange estimate inverse operation solve problems number facts place value	Addition and Subtraction Methods		
3-digit and 1-digit numbers Not crossing 10s $268 - 4 = 264$  $343 + 6 = 349$  Crossing 10s (Exchanging)  $316 + 8 = 324$  $324 - 8 = 316$		3-digit and 2-digit numbers Add and subtract tens  $451 + 3 \text{ tens} = 481$ ($5 + 3 = 8$) $451 - 4 \text{ tens} = 411$ ($5 - 4 = 1$) Crossing 10s (Exchanging) $258 + 80 = 338$ • Column method • Count in 10s mentally • Add 100, subtract 20 Crossing 10 and 100 	
		3-digit numbers Not crossing $679 - 351 = 328$  Crossing 10s (Exchanging)  Add and Subtract 100s $284 + 300 = 584$ 	

Addition and Subtraction		Knowledge Organiser					
Estimate Estimate by dividing the hundred into 250 and 225. Estimate 10s (330, 340) between 325 and 350.  Estimate $167 - 89$ Use near numbers $170 - 90 = 80$ Near numbers: 	Check Answers  $347 - 74 = 273$ can be checked using $273 + 74 = 347$ This part whole shows the inverse calculations using these three numbers.  <table border="1"> <tbody> <tr> <td>$154 + 269 = 423$</td> <td>$269 + 154 = 423$</td> </tr> <tr> <td>$423 - 154 = 269$</td> <td>$423 - 269 = 154$</td> </tr> </tbody> </table>			$154 + 269 = 423$	$269 + 154 = 423$	$423 - 154 = 269$	$423 - 269 = 154$
$154 + 269 = 423$	$269 + 154 = 423$						
$423 - 154 = 269$	$423 - 269 = 154$						

Addition and Subtraction: Stage 4

Addition and Subtraction		Knowledge Organiser	
Key Vocabulary		Addition and Subtraction Methods	
Add	Add 4-digit numbers	Subtract 4-digit numbers	
Total			
Plus			
Sum	No exchange	No exchange	
More	$\begin{array}{r} 5162 \\ + 3427 \\ \hline 8589 \end{array}$	$\begin{array}{r} 5789 \\ - 3421 \\ \hline 2368 \end{array}$	
Altogether	Starting with the ones, add each column in turn.	Starting with the ones, subtract each column in turn.	
Difference	One exchange	One exchange	
Subtract			
Less			
Minus	$\begin{array}{r} 5162 \\ + 3497 \\ \hline 8659 \\ 1 \end{array}$	$\begin{array}{r} 61 \\ 5749 \\ - 3471 \\ \hline 2278 \end{array}$	
Take away	Starting with the ones, add each column in turn. When adding 6 tens + 9 tens = 15 tens = 1 hundred + 5 tens	Starting with the ones, subtract each column in turn. When subtracting 4 tens - 7 tens, exchange 1 hundred to make:	
Mentally, Orally	Place 1 hundred under the hundreds answer and 5 tens in the answer.	14 tens - 7 tens = 7 tens	
Column Addition	Multiple exchanges	Multiple exchanges	
Column Subtraction			
Exchange			
Estimate	$\begin{array}{r} 5864 \\ + 3497 \\ \hline 9361 \\ 111 \end{array}$	$\begin{array}{r} 6131 \\ 5742 \\ - 3476 \\ \hline 2266 \end{array}$	
Inverse operation	Starting with the ones, add each column in turn. Exchange tens, hundreds and/ or thousands as required.	Starting with the ones, subtract each column in turn. Exchange tens, hundreds and/ or thousands as required.	
Solve problems			
Number facts			
Efficient subtraction			
Calculate $6000 - 3617 = 2383$			
			

Addition and Subtraction

Knowledge Organiser

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

Here is the number 3124

Add 2 thousands = 5124

Add 5 hundreds = 5624

Subtract 2 tens = 5604

Add 5 ones = 5609

Here is the number 6708

Thousands	Hundreds	Tens	Ones
6	7	0	8

Add 3 thousands = 9708

Subtract 4 hundreds = 9308

Add 5 tens = 9358

Subtract 7 ones = 9351

Crossing ones, tens or hundreds

5392 + 4 tens = 5432 crossing tens

5126 - 600 = 4526 crossing hundreds

When crossing ones, tens or hundreds, more than one digit will change.

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Round to Estimate

1635 + 386 = 2021

Round to the nearest ten

1640 + 390 = 2030

Round to the nearest hundred

1600 + 400 = 2000

Both give a reasonable estimate, but rounding the nearest ten is more accurate.

9362 - 5729 = 3622

Round to the nearest hundred

9400 - 5700 = 3700

Round to the nearest thousand

9000 - 6000 = 3000

Rounding to the nearest hundred is much more accurate in this case.

Checking Strategies

Using Inverse

3476 - 744 = 2732 can be checked using

2732 + 744 = 3476

This part whole shows the inverse calculations using these three numbers.

1549 + 2688 = 4237	2688 + 1549 = 4237
4237 - 1549 = 2688	4237 - 2688 = 1549

Adding in a different order

420 + 372 + 280 =

Change to

420 + 280 + 372 =

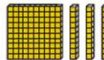
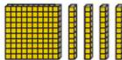
As 420 + 280 = 700

(because 42 + 28 = 70)

420 + 280 + 372 = 700 + 372 = 1072

Number and Place Value

Value: Stage 3

Number and Place Value											Knowledge Organiser										
Key Vocabulary		3-Digit Numbers										10 and 100 More or Less									
hundreds		256										Ten Less  120			Ten More  130			Ten More  140			
tens		two hundred  200		fifty  50		six  6															
ones																					
zero																					
place value																					
greater than																					
less than																					
order																					
more																					
less																					
partition																					
digit																					

Number and Place Value

Knowledge Organiser

Compare and Order

100s	10s	1s
		

324 > 243

greater than

100s	10s	1s
		

		
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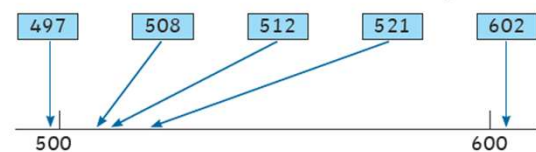
79 < 126

less than

		
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smallest

greatest



497 508 512 521 602

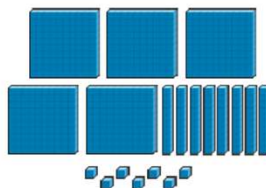
500 600

Represent Numbers to 1000

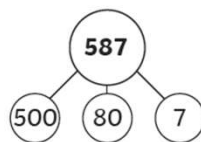
587

five hundred and eighty-seven

Hundreds	Tens	Ones
		



$$500 + 80 + 7$$

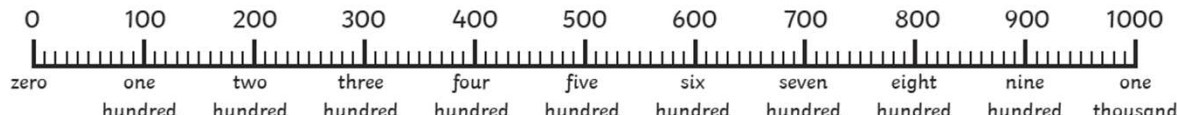


587

500 80 7

Hundreds	Tens	Ones
		

Numerals and Words to 1000



0 100 200 300 400 500 600 700 800 900 1000

zero one two three four five six seven eight nine one

hundred hundred hundred hundred hundred hundred hundred hundred thousand

Number and Place Value: Stage 4

Number and Place Value					Knowledge Organiser										
Key Vocabulary	Counting														
thousands	Counting in 6s														
hundreds	0	6	12	18	24	30	36	42	48	54	60				
tens	Counting in 7s														
ones	0	7	14	21	28	35	42	49	56	63	70				
zero	Counting in 9s														
place value	0	9	18	27	36	45	54	63	72	81	90				
greater than	Counting in 25s														
less than	0	25	50	75	100	125	150	175	200	225	250				
order	Counting in 1000s														
round	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10 000				
rounded to															
negative number															
partition															
digit															
Roman numeral															
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Compare and Order					1000 More or 1000 Less						
Th	H	T	O	43 24 > 32 43 greater than	Th	H	T	O	1000 Less	1000 More	
●●●	●●●	●●	●●●		●●●	●●●	●●●	●●●			
										1000	1000
										100	100
										10	10
										1	1
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Number and Place Value

Knowledge Organiser

Negative Numbers

Represent 4-Digit Numbers

3487

three thousand, four hundred and eighty-seven

1000s	100s	10s	1s

Thousands	Hundreds	Tens	Ones

Roman Numerals

one	1	I
five	5	V
ten	10	X
fifty	50	L
one hundred	100	C

XVIII = 18

XXIX = 29

LXXXIV = 84

Rounding

Look at the place value column to the right of the value you are rounding to. If this digit is a 4 or less, round down. If the digit is a 5 or more, round up.

Rounding to nearest 10

20	21	22	23	24	25	26	27	28	29	30
← round down					round up →					

Rounding to the nearest 100

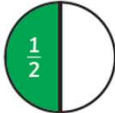
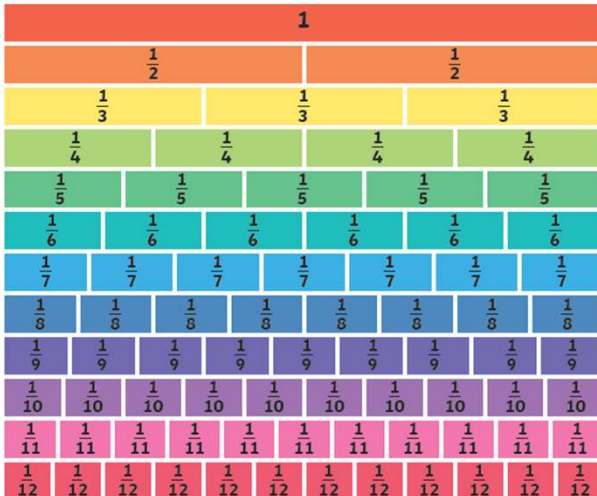
200	249	250	300
← round down		round up →	

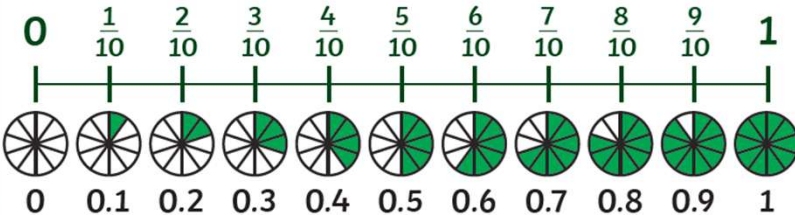
Rounding to the nearest 1000

2000	2499	2500	3000
← round down		round up →	

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Fractions: Stage 3

Fractions		Knowledge Organiser	
Key Vocabulary	Recognising Fractions	Comparing Fractions	
numerator	$\frac{3}{8}$ Numerator How many equal parts of the whole are needed? Denominator How many equal parts are in the whole?	$\frac{1}{3}$  $\frac{2}{3}$	
denominator		$\frac{4}{5}$  $\frac{3}{5}$	
unit fraction			
non-unit fraction			
equivalent			
halves	Equivalent Fractions		
thirds	 is equal to... $\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \frac{5}{10} = \frac{6}{12}$ 		
quarters	 is equal to... $\frac{1}{4} = \frac{2}{8} = \frac{3}{12} = \frac{4}{16} = \frac{5}{20}$ 		
fifths			
sixths			
eighths			
tenths			
decimal tenths			
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Fractions		Knowledge Organiser
Add and Subtract Fractions	Tenths	
$\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$ 		
$\frac{3}{7} + \frac{2}{7} = \frac{5}{7}$ 	Fractions of Amounts $\frac{1}{4}$ of 24 = 6 	
$\frac{5}{6} - \frac{2}{6} = \frac{3}{6}$ 	$\frac{1}{3}$ of 72 = 24 	
	$\frac{2}{5}$ of 40 = 16 	
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Fractions: Stage 4

Fractions	Knowledge Organiser																
Key Vocabulary	Fraction Families																
numerator																	
denominator																	
unit fraction																	
non-unit fraction																	
equivalent																	
quantities																	
whole																	
halves																	
thirds																	
quarters																	
fifths																	
sixths																	
sevenths																	
eighths																	
ninths																	
tenths																	
elevenths																	
twelfths																	
quantities																	
Fractions of Quantities																	
To find a fraction of a number, divide by the denominator and multiply by numerator.																	
To find quarters of 20:																	
<table><tr><td colspan="4">20</td></tr><tr><td>5</td><td>5</td><td>5</td><td>5</td></tr></table>		20				5	5	5	5								
20																	
5	5	5	5														
$\frac{1}{4}$ of 20 = 5 $\frac{2}{4}$ of 20 = 10 $\frac{3}{4}$ of 20 = 15 $\frac{4}{4}$ of 20 = 20																	
To find eighths of 56:																	
<table><tr><td colspan="8">56</td></tr><tr><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td></tr></table>		56								7	7	7	7	7	7	7	7
56																	
7	7	7	7	7	7	7	7										
$\frac{1}{8}$ of 56 = 7 $\frac{2}{8}$ of 56 = 14 $\frac{3}{8}$ of 56 = 21 $\frac{4}{8}$ of 56 = 28 $\frac{5}{8}$ of 56 = 35 $\frac{6}{8}$ of 56 = 42 $\frac{7}{8}$ of 56 = 49 $\frac{8}{8}$ of 56 = 56																	

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Fractions	Knowledge Organiser
Adding Fractions	Subtracting fractions
Fractions can be added when the denominators are the same. $\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$ $\frac{2}{8} + \frac{4}{8} + \frac{1}{8} = \frac{7}{8}$ $\frac{4}{5} + \frac{2}{5} = \frac{6}{5}$ or $1\frac{1}{5}$	Fractions can be subtracted when the denominators are the same. $\frac{3}{4} - \frac{2}{4} = \frac{1}{4}$ $\frac{8}{6} - \frac{5}{6} = \frac{3}{6}$

Multiplication and Division: Stage 3

Multiplication and Division		Knowledge Organiser																																																																																																																																																																												
Key Vocabulary times tables multiply by divide by array fact families regrouping	Multiplication and Division Facts (3, 4 and 8 multiplication tables)																																																																																																																																																																													
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Multiplication and Division		Knowledge Organiser							
Written Multiplication Methods - No Regrouping		Written Multiplication Methods - With Regrouping							
Tens Ones $23 \times 3 = 69$ <table border="1"> <tr><th>T</th><th>O</th></tr> <tr><td>2</td><td>3</td></tr> <tr><td>x</td><td>3</td></tr> <tr><td>6</td><td>9</td></tr> </table>		T	O	2	3	x	3	6	9
T	O								
2	3								
x	3								
6	9								

Multiplication and Division: Stage 4

Multiplication and Division

Knowledge Organiser

Key Vocabulary

Multiplication and Division Facts

Use Place Value to Multiply and Divide Mentally

multiply

x	1	2	3	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	---	----	----	----

groups of

1	1	2	3	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	---	----	----	----

lots of

2	2	4	6	8	10	12	14	16	18	20	22	24
---	---	---	---	---	----	----	----	----	----	----	----	----

times

3	3	6	9	12	15	18	21	24	27	30	33	36
---	---	---	---	----	----	----	----	----	----	----	----	----

divide

4	4	8	12	16	20	24	28	32	36	40	44	48
---	---	---	----	----	----	----	----	----	----	----	----	----

share

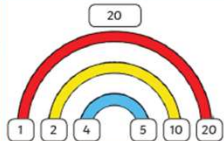
5	5	10	15	20	25	30	35	40	45	50	55	60
---	---	----	----	----	----	----	----	----	----	----	----	----

remainder

6	6	12	18	24	30	36	42	48	54	60	66	72
---	---	----	----	----	----	----	----	----	----	----	----	----

factor

Factor pairs and Commutativity



The factors of 20 are 1, 2, 4, 5, 10 and 20.

The factor pairs are:

1 and 20 2 and 10 4 and 5

$5 \times 4 = 20$

$4 \times 5 = 20$

multiple

product

Multiply Using Formal Written Methods

Th	H	T	O
	5	4	3
x			4
		1	2
	1	6	0
2	0	0	0
2	1	7	2

Th	H	T	O
	5	4	3
x			4
2	1	7	2
	1	1	

Remember to move any regrouped numbers into the next column. After the next multiplication, add the regrouped number to the answer.

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Multiplication and Division

Knowledge Organiser

Mental Calculations for Solving Problems

$$(2 \times 3) \times 4 = 24$$

$$(2 \times 4) \times 3 = 24$$

$$(3 \times 4) \times 2 = 24$$

```

    graph TD
      A[16 x 3] --> B[10 x 3]
      A --> C[6 x 3]
      B --> D[30]
      C --> E[18]
      D --> F[30 + 18 = 48]
      E --> F
  
```

Integer Scaling Problems

10 pencils

$10 \times 4 = 40$ pencils

75g

$75g \times 2 = 150g$

Short Division with Exact Answers

There are 69 tennis balls packed in tubes of 3.

There are 23 tubes altogether.

$$69 \div 3 = 23$$

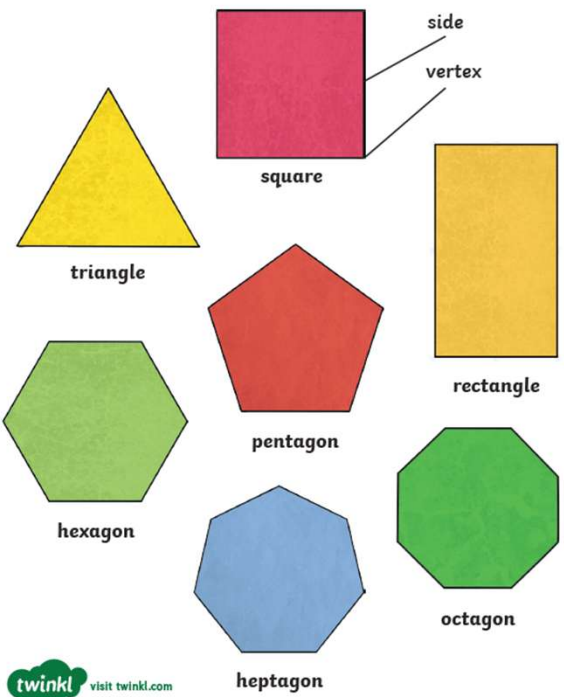
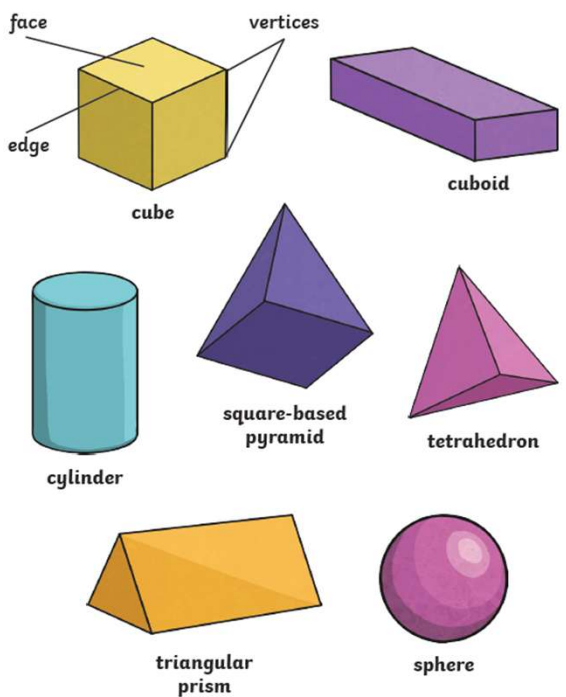
$$\begin{array}{r} 23 \\ 3 \overline{) 69} \end{array}$$

69		
23	23	23

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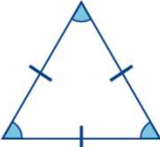
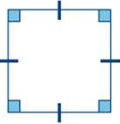
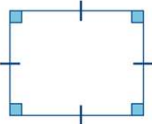
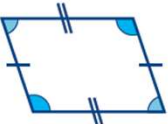
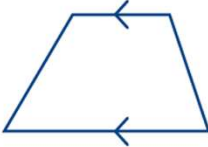
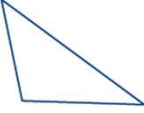
Properties of Shapes: Stage 3

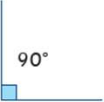
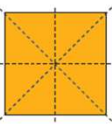
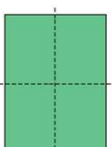
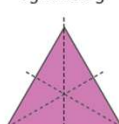
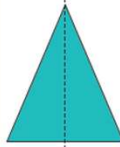
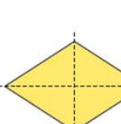
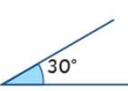
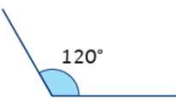
Properties of Shapes		Knowledge Organiser	
Key Vocabulary	Turns and Angles		
quarter turn	Angles can be used as a description of a turn.		
half turn			
three-quarter turn			
angle			
right angle			
acute			
obtuse			
horizontal			
vertical			
parallel			
perpendicular			
polygon			
two-dimensional			
three-dimensional			
flat face			
curved surface			
edge			
curved edge			
vertex			
vertices			
apex			
</			

Properties of Shapes		Knowledge Organiser	
Recognise and Describe 2D Shapes		Recognise and Describe 3D Shapes	
			

Properties of Shapes:

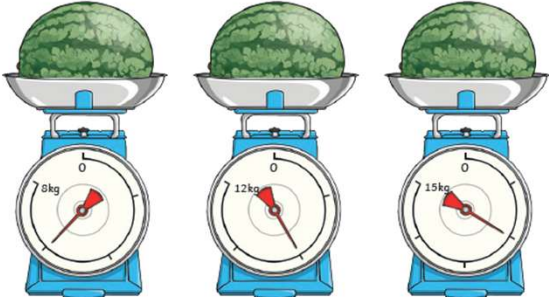
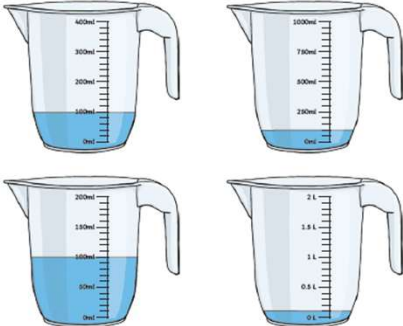
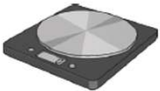
Stage 4

Properties of Shape		Knowledge Organiser	
Key Vocabulary	Triangles	Quadrilaterals	
angle	Triangles have 3 sides and 3 vertices. The total of the angles in a triangle is 180° .	A quadrilateral is a polygon with four sides.	
right angle			
acute	An equilateral triangle is a regular polygon. It has sides of equal length and each angle is 60° .	A square has four sides of equal length and four right angles (90°). A square is also a rectangle, a rhombus and a parallelogram.	
obtuse		A rectangle has two pairs of parallel, equal sides and four right angles. A rectangle is also a parallelogram.	
horizontal	An isosceles triangle has two sides of equal length and two angles of equal size.		
vertical		A parallelogram has two pairs of parallel, equal sides and opposite equal angles.	
diagonal	A right-angled triangle always has one 90° angle.	A rhombus has four sides of equal length and opposite equal angles. A rhombus is also a parallelogram.	
parallel	It can be isosceles or scalene.		
perpendicular		A trapezium only has one pair of opposite parallel sides.	
two-dimensional	A scalene triangle has no equal sides or angles.	A kite has two pairs of adjacent equal sides and one pair of opposite equal angles.	
polygon			
line of symmetry			
reflection			
mirror line			
isosceles			
equilateral			
scalene			
quadrilateral			
rhombus			
parallelogram			
trapezium			

Properties of Shape		Knowledge Organiser	
Angles	Lines of Symmetry	Symmetric Figures	
An angle is created when two straight lines meet at a point or intersect.	Lines of symmetry may be horizontal, vertical or diagonal. Some 2D shapes will have no lines of symmetry and some 2D shapes will have multiple lines of symmetry.	Patterns and shapes can be reflected in a mirror line. Mirror lines can be vertical, horizontal or diagonal.	
Right angle The intersection of perpendicular lines creates a right angle.	A square has four lines of symmetry.	A rectangle has two lines of symmetry.	An equilateral triangle has three lines of symmetry.
			
Acute angle Any angle measuring more than 0 degrees and less than 90 degrees is acute.			
			
			
Obtuse angle Any angle measuring more than 90 degrees but less than 180 degrees is obtuse.			
			

Mass and Capacity: Stage 3

Mass and Capacity	Knowledge Organiser
Key Vocabulary	Measure and Compare Mass
mass	Scales can be used to measure grams. A gram is a unit of measurement that is used to measure the mass of something. Grams can be written as g.  Scales can be used to measure kilograms. A kilogram is a unit of measurement that is greater than a gram. It is also used to measure the mass of something. Kilograms can be written as kg.  1000g = 1kg To compare mass, we can use the words 'heavier' and 'lighter'.
gram	
kilogram	
capacity	
volume	
millilitre	
litre	Measure and Compare Capacity
lighter	Capacity is the amount of liquid a container can hold. Volume is how much liquid is in the container. Measuring cylinders can be used to measure smaller volumes.  Greater volumes are measured in litres. Litres can be written as l.  1000ml = 1l To compare capacities, we can use the word 'full'.
heavier	
 visit twinkl.com	

Reading Scales	Knowledge Organiser
Mass	Capacity
Each of the melons has a mass of 6kg but the arrows are all pointing at different points on the scales. This is because each of the measuring scales have different increments marked on them.  Always look carefully at how the numbers on the scales increase when reading a measurement.	Measuring containers all have different capacities.  Each of these containers contain the same volume of 100 millilitres but have different capacities and scales. Always look carefully at how the numbers on the scales increase when reading a measurement.
Add and Subtract Mass	Add and Subtract Capacities
$600g + 500g = 1100g = \mathbf{1kg\ 100g}$ $1kg - 300g = 1000g - 300g = \mathbf{700g}$   visit twinkl.com	$800ml + 400ml = 1200ml = \mathbf{1l\ 200ml}$ $1l\ 300ml - 200ml = \mathbf{1l\ 100ml}$ 