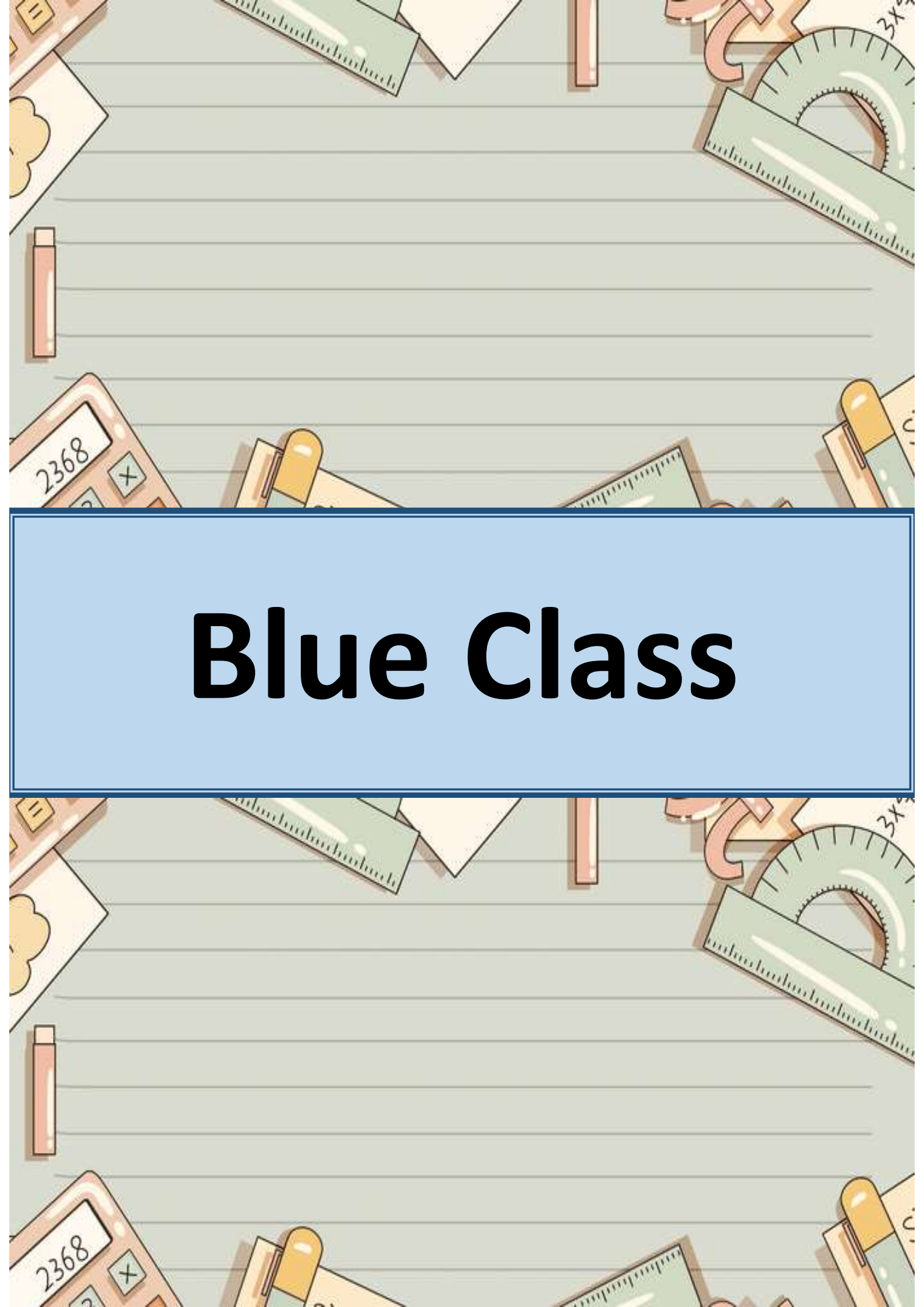
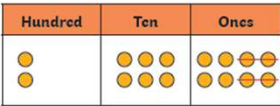
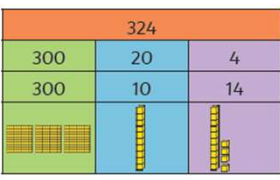
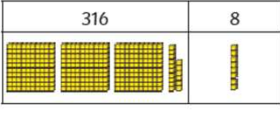
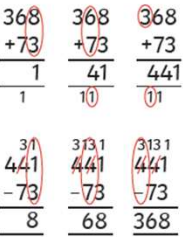
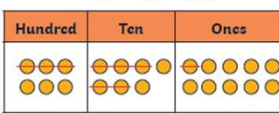
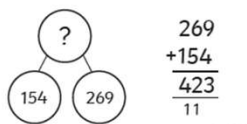
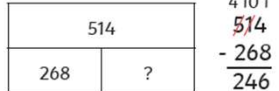
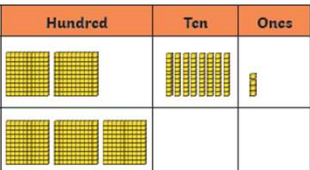
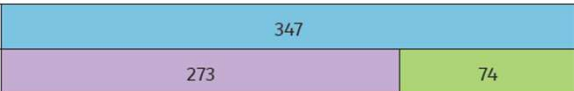
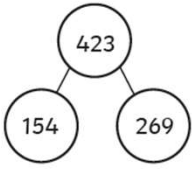


The background of the page is a light gray surface with horizontal lines, resembling a notebook. It is decorated with various school supplies: a green ruler, a protractor, a calculator showing '2368', a pencil, a paperclip, and a small notepad with a cloud drawing. These items are scattered around the 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	No exchange		No exchange
Plus	$\begin{array}{r} 5162 \\ + 3427 \\ \hline 8589 \end{array}$		$\begin{array}{r} 5789 \\ - 3421 \\ \hline 2368 \end{array}$
Sum	Starting with the ones, add each column in turn.		Starting with the ones, subtract each column in turn.
More			
Altogether	One exchange		One exchange
Difference	$\begin{array}{r} 5162 \\ + 3497 \\ \hline 8659 \\ 1 \end{array}$		$\begin{array}{r} 61 \\ 5749 \\ - 3471 \\ \hline 2278 \end{array}$
Subtract	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:
Less	Place 1 hundred under the hundreds answer and 5 tens in the answer.		14 tens - 7 tens = 7 tens
Minus			
Take away	Multiple exchanges		Multiple exchanges
Mentally, Orally	$\begin{array}{r} 5864 \\ + 3497 \\ \hline 9361 \\ 111 \end{array}$		$\begin{array}{r} 6131 \\ 5742 \\ - 3476 \\ \hline 2266 \end{array}$
Column Addition	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.
Column Subtraction			
Exchange			
Estimate			
Inverse operation			
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

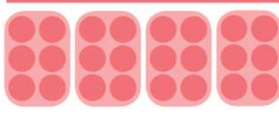
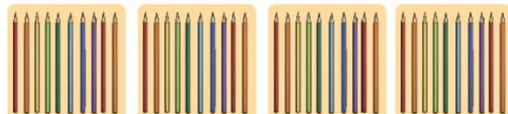
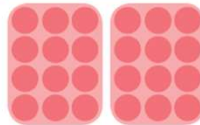
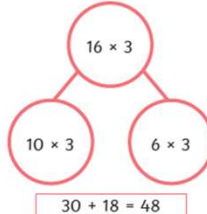
Multiplication and Division: Stage 3

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: 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	 5 × 1 = 5 5 ÷ 1 = 5																											
groups of	1	1	2	3	4	5	6	7	8	9	10	11	12	 5 × 10 = 50 50 ÷ 10 = 5																											
lots of	2	2	4	6	8	10	12	14	16	18	20	22	24	 5 × 100 = 500 500 ÷ 100 = 5																											
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																												
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	12	12	24	36	48	60	72	84	96	108	120	132	144																												
Factor pairs and Commutativity													Multiply Using Formal Written Methods																												
factor	 20 5 × 4 = 20 4 × 5 = 20 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												<table><tr><td>Th</td><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td>5</td><td>4</td><td>3</td></tr><tr><td>x</td><td></td><td></td><td>4</td></tr><tr><td></td><td></td><td>1</td><td>2</td></tr><tr><td></td><td>1</td><td>6</td><td>0</td></tr><tr><td>2</td><td>0</td><td>0</td><td>0</td></tr><tr><td>2</td><td>1</td><td>7</td><td>2</td></tr></table> (4 × 3) (4 × 40) (4 × 500)	Th	H	T	O		5	4	3	x			4			1	2		1	6	0	2	0	0	0	2	1	7	2
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multiple													<table><tr><td>Th</td><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td>5</td><td>4</td><td>3</td></tr><tr><td>x</td><td></td><td></td><td>4</td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td>2</td><td>1</td><td>7</td><td>2</td></tr><tr><td></td><td>1</td><td>1</td><td></td></tr></table>	Th	H	T	O		5	4	3	x			4					2	1	7	2		1	1					
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x			4																																						
2	1	7	2																																						
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product													Remember to move any regrouped numbers into the next column. After the next multiplication, add the regrouped number to the answer.																												

Multiplication and Division		Knowledge Organiser	
Mental Calculations for Solving Problems		Integer Scaling Problems	
$(2 \times 3) \times 4 = 24$ 	$(2 \times 4) \times 3 = 24$ 	10 pencils 	$10 \times 4 = 40$ pencils 
$(3 \times 4) \times 2 = 24$ 		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.

$69 \div 3 = 23$

23

3

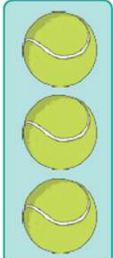
69

69

23

23

23



Number and Place Value

Value: Stage 3

Number and Place Value

Knowledge Organiser

Key Vocabulary

hundreds

tens

ones

zero

place value

greater than

less than

order

more

less

partition

digit

3-Digit Numbers

256

two hundred

200

fifty

50

six

6

Counting in 4s and 8s

0 4 8 12 16 20 24 28 32 36 40

0 8 16 24 32 40 48 56 64 72 80

10 and 100 More or Less

Ten Less

120

Ten More

130

140

One Hundred Less

212

One Hundred More

312

412

Counting in 50s and 100s

0 50 100 150 200 250 300 350 400 450 500

0 100 200 300 400 500 600 700 800 900 1000

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Number and Place Value

Knowledge Organiser

Compare and Order

100s	10s	1s

324 > 243

greater than

100s	10s	1s

--	--	--

79 < 126

less than

--	--	--

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 hundred two hundred three hundred four hundred five hundred six hundred seven hundred eight hundred nine hundred one thousand

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Number and Place Value: Stage 4

[illegible]

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

3487

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

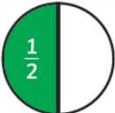
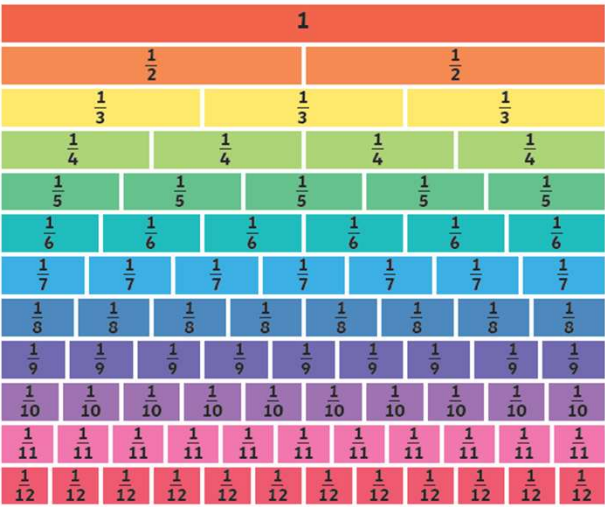
Rounding to the nearest 100

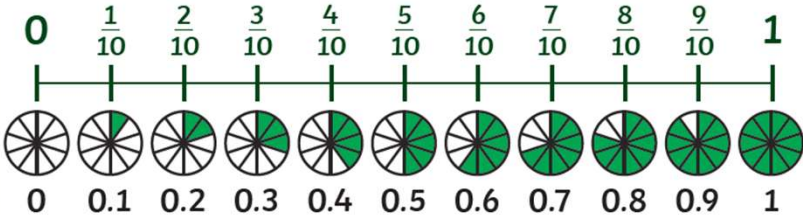
Rounding to the nearest 1000

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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?	$\frac{1}{3}$ Less than $\frac{2}{3}$
denominator		$\frac{4}{5}$ Greater than $\frac{3}{5}$
unit fraction		
non-unit fraction		
equivalent		
halves	Equivalent Fractions  $\frac{1}{2}$ is equal to... $\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \frac{5}{10} = \frac{6}{12}$	
thirds		
quarters		
fifths		
sixths		
eighths		
tenths		
decimal tenths		

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	
$\frac{5}{6} - \frac{2}{6} = \frac{3}{6}$ 		$\frac{1}{4} \text{ of } 24 = 6$ 	
		$\frac{1}{3} \text{ of } 72 = 24$ 	
		$\frac{2}{5} \text{ of } 40 = 16$ 	

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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:		
$\frac{1}{4}$ 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:		
$\frac{1}{8}$ 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		

Fractions

Knowledge Organiser

Adding Fractions

Fractions can be added when the denominators are the same.

$$\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$$

$$\frac{2}{8} + \frac{4}{8} + \frac{1}{8} = \frac{7}{8}$$

$$\frac{4}{5} + \frac{2}{5} = \frac{6}{5} \text{ or } 1\frac{1}{5}$$

Subtracting fractions

Fractions can be subtracted when the denominators are the same.

$$\frac{3}{4} - \frac{2}{4} = \frac{1}{4}$$

$$\frac{8}{6} - \frac{5}{6} = \frac{3}{6}$$

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Properties of Shape:

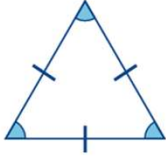
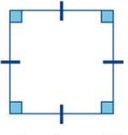
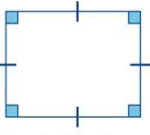
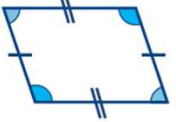
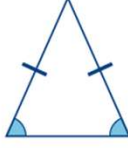
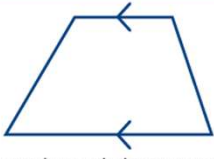
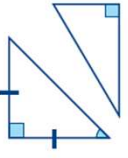
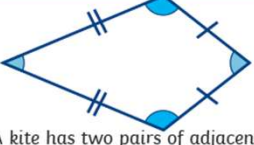
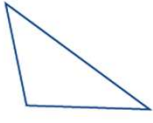
Stage 3

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	
triangle square rectangle pentagon hexagon heptagon octagon		cube cuboid cylinder square-based pyramid tetrahedron triangular prism sphere	

Properties of Shape:

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

Knowledge Organiser

Angles

An angle is created when two straight lines meet at a point or intersect.

Right angle

The intersection of perpendicular lines creates a right angle.

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.

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Lines of Symmetry

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.

A square has four lines of symmetry.

A rectangle has two lines of symmetry.

An equilateral triangle has three lines of symmetry.

An isosceles triangle has one line of symmetry.

A rhombus has two lines of symmetry.

Symmetric Figures

Patterns and shapes can be reflected in a mirror line. Mirror lines can be vertical, horizontal or diagonal.

Length and Perimeter: Stage 3

Length and Perimeter

Knowledge Organiser

Key Vocabulary

metre (m)
centimetre (cm)
millimetre (mm)
height
length
width
perimeter
further/furthest
higher/highest
longer/longest
shorter/shortest
taller/tallest

Measure Length

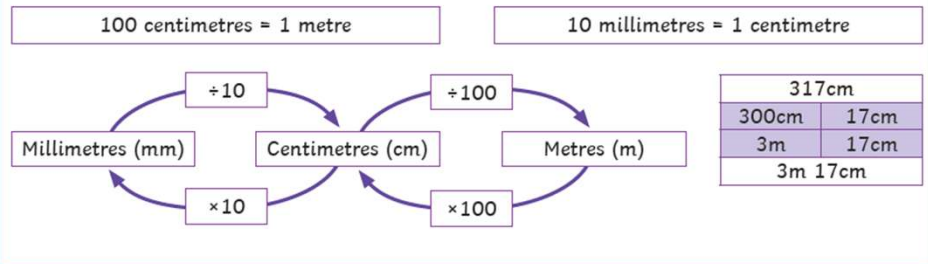
5mm 5cm

10mm = 1cm

4cm 6mm

38mm

Equivalent Length



Length and Perimeter

Knowledge Organiser

Compare Lengths

$6\text{mm} < 6\text{cm}$ $6\text{cm} = 60\text{mm}$ 6mm is shorter than 6cm
$320\text{cm} > 2\text{m } 60\text{cm}$ $320\text{cm} > 200\text{cm} + 60\text{cm}$ 320cm is longer than $2\text{m } 60\text{cm}$
$98\text{mm} < 12\text{cm } 3\text{mm}$ $98\text{mm} < 120\text{mm} + 3\text{mm}$ 98mm is shorter than $12\text{cm } 3\text{mm}$

Add and Subtract Lengths

$14\text{cm} + 19\text{cm} = 33\text{cm}$ $8\text{cm } 2\text{mm} + 16\text{mm} =$ 98mm or $9\text{cm } 8\text{mm}$	$6\text{m} - 2\text{m } 28\text{cm}$ $6\text{m} - 2\text{m} = 4\text{m}$ $4\text{m} - 28\text{cm} = 3\text{m } 72\text{cm}$										
<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td colspan="2">?</td></tr> <tr><td>8cm 2mm</td><td>16mm</td></tr> <tr><td>82mm</td><td>16mm</td></tr> </table>	?		8cm 2mm	16mm	82mm	16mm	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td colspan="2">6m</td></tr> <tr><td>2m 28cm</td><td>?</td></tr> </table>	6m		2m 28cm	?
?											
8cm 2mm	16mm										
82mm	16mm										
6m											
2m 28cm	?										

Perimeter

..... = perimeter

5cm + 2cm + 5cm + 2cm = 14cm

3cm + 3cm + 3cm + 3cm + 3cm = 15cm

perimeter = 20cm
 $6\text{cm} + 6\text{cm} = 12\text{cm}$
 $20\text{cm} - 12\text{cm} = 8\text{cm}$
 $8\text{cm} \div 2 = 4\text{cm}$

6cm