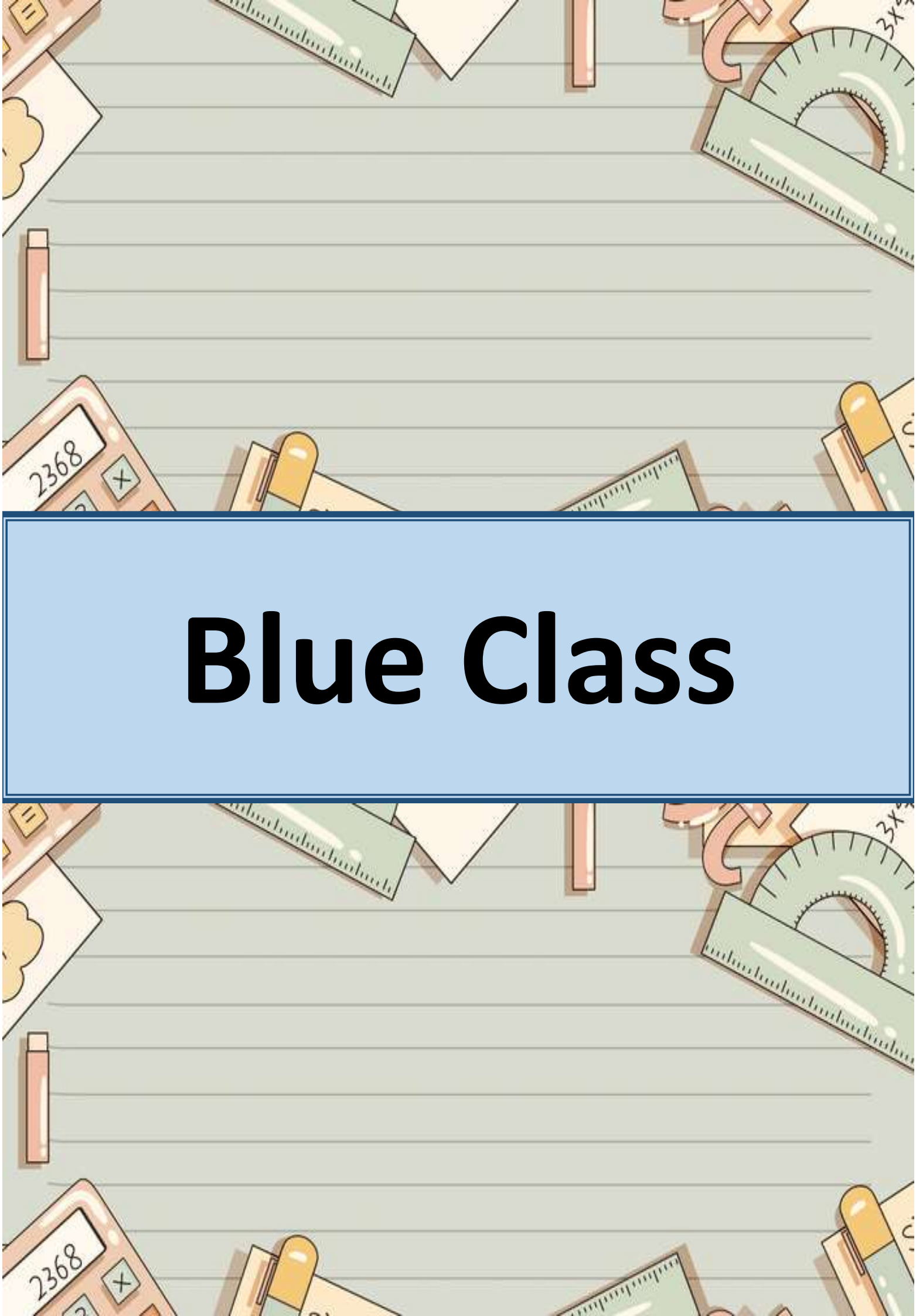

Blue Class

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

twinkl visit twinkl.com

Addition and Subtraction Methods

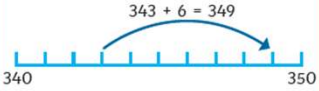
3-digit and 1-digit numbers

Not crossing 10s

268 – 4 = 264

Hundred	Ten	Ones
●●	●●●	●●●●

343 + 6 = 349



Crossing 10s (Exchanging)

324		
300	20	4
300	10	14

316 + 8 = 324

316	8

324 - 8 = 316

3-digit and 2-digit numbers

Add and subtract tens

Hundred	Ten	Ones
●●	●●●	●

451 + 3 tens = 481 (5 + 3 = 8)

451 – 4 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

368	368	368
+73	+73	+73
1	41	441
1	11	11

31	3131	3131
441	441	441
–73	–73	–73
8	68	368

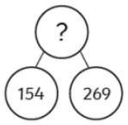
3-digit numbers

Not crossing

679 – 351 = 328

Hundred	Ten	Ones
●●●	●●●●	●●●●●

Crossing 10s (Exchanging)



269
+154
423
11

514	
268	?

4 10 1
5 1 4
- 2 6 8
2 4 6

Add and Subtract 100s

284 + 300 = 584

Hundred	Ten	Ones
■■	▮▮▮▮▮	▪
■■■		

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:

413	279	521	782
↓	↓	↓	↓
400	300	500	800

twinkl visit twinkl.com

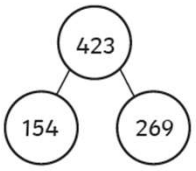
Check Answers

347	
273	74

347 – 74 = 273 can be checked using

273 + 74 = 347

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



154 + 269 = 423	269 + 154 = 423
423 – 154 = 269	423 – 269 = 154

Addition and Subtraction: Stage 4

Addition and Subtraction — Knowledge Organiser

Key Vocabulary

- Add
- Total
- Plus
- Sum
- More
- Altogether
- Difference
- Subtract
- Less
- Minus
- Take away
- Mentally, Orally
- Column Addition
- Column Subtraction
- Exchange
- Estimate
- Inverse operation
- Solve problems
- Number facts

twinkl visit twinkl.com

Addition and Subtraction Methods

Add 4-digit numbers

No exchange

$$\begin{array}{r} 5162 \\ +3427 \\ \hline 8589 \end{array}$$

Starting with the ones, add each column in turn.

One exchange

$$\begin{array}{r} 5162 \\ +3497 \\ \hline 8659 \\ \hline 1 \end{array}$$

Starting with the ones, add each column in turn. When adding
6 tens + 9 tens = 15 tens
= 1 hundred + 5 tens
Place 1 hundred under the hundreds answer and 5 tens in the answer.

Multiple exchanges

$$\begin{array}{r} 5864 \\ +3497 \\ \hline 9361 \\ \hline 111 \end{array}$$

Starting with the ones, add each column in turn. Exchange tens, hundreds and/ or thousands as required.

Subtract 4-digit numbers

No exchange

$$\begin{array}{r} 5789 \\ -\ 3421 \\ \hline 2368 \end{array}$$

Starting with the ones, subtract each column in turn.

One exchange

$$\begin{array}{r} {\scriptstyle 6\ 1} \\ 5749 \\ -\ 3471 \\ \hline 2278 \end{array}$$

Starting with the ones, subtract each column in turn. When subtracting 4 tens -7 tens, exchange 1 hundred to make:
14 tens – 7 tens = 7 tens

Multiple exchanges

$$\begin{array}{r} {\scriptstyle 6131} \\ 5742 \\ -\ 3476 \\ \hline 2266 \end{array}$$

Starting with the ones, subtract each column in turn. Exchange tens, hundreds and/ or thousands as required.

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

5**39**2 + **4** tens = 5**43**2 crossing tens
5126 – **6**00 = **45**26 crossing hundreds

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

twinkl visit twinkl.com

Round to Estimate

1635 + 386 = 2021
Round to the nearest ten
1640 + 390 = 2030
Round to the nearest hundred
1600 + 400 = 2000

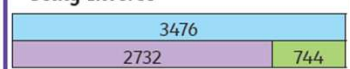
Both give a reasonable estimate, but rounding the nearest ten is more accurate.

9362 – 5729 = 3622
Round to the nearest hundred
9400 – 5700 = 3700
Round to the nearest thousand
9000 – 6000 = 3000

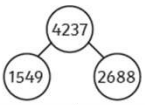
Rounding to the nearest hundred is much more accurate in this case.

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)

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

3 x Tables

1 × 3 = 3
2 × 3 = 6
3 × 3 = 9
4 × 3 = 12
5 × 3 = 15
6 × 3 = 18
7 × 3 = 21
8 × 3 = 24
9 × 3 = 27
10 × 3 = 30
11 × 3 = 33
12 × 3 = 36

3 ÷ 3 = 1
6 ÷ 3 = 2
9 ÷ 3 = 3
12 ÷ 3 = 4
15 ÷ 3 = 5
18 ÷ 3 = 6
21 ÷ 3 = 7
24 ÷ 3 = 8
27 ÷ 3 = 9
30 ÷ 3 = 10
33 ÷ 3 = 11
36 ÷ 3 = 12

4 x Tables

1 × 4 = 4
2 × 4 = 8
3 × 4 = 12
4 × 4 = 16
5 × 4 = 20
6 × 4 = 24
7 × 4 = 28
8 × 4 = 32
9 × 4 = 36
10 × 4 = 40
11 × 4 = 44
12 × 4 = 48

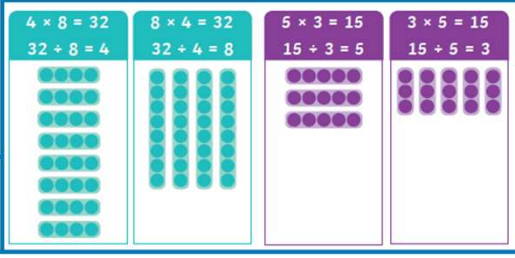
4 ÷ 4 = 1
8 ÷ 4 = 2
12 ÷ 4 = 3
16 ÷ 4 = 4
20 ÷ 4 = 5
24 ÷ 4 = 6
28 ÷ 4 = 7
32 ÷ 4 = 8
36 ÷ 4 = 9
40 ÷ 4 = 10
44 ÷ 4 = 11
48 ÷ 4 = 12

8 x Tables

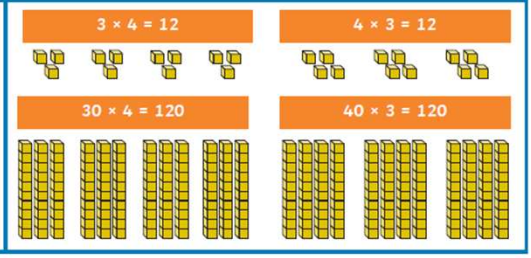
1 × 8 = 8
2 × 8 = 16
3 × 8 = 24
4 × 8 = 32
5 × 8 = 40
6 × 8 = 48
7 × 8 = 56
8 × 8 = 64
9 × 8 = 72
10 × 8 = 80
11 × 8 = 88
12 × 8 = 96

8 ÷ 8 = 1
16 ÷ 8 = 2
24 ÷ 8 = 3
32 ÷ 8 = 4
40 ÷ 8 = 5
48 ÷ 8 = 6
56 ÷ 8 = 7
64 ÷ 8 = 8
72 ÷ 8 = 9
80 ÷ 8 = 10
88 ÷ 8 = 11
96 ÷ 8 = 12

Write and Calculate Mathematical Statements



Related Calculations



Multiplication and Division — Knowledge Organiser

Written Multiplication Methods - No Regrouping

Tens	Ones

23 × 3 = 69

	T	O
	2	3
×		3
	6	9

Written Multiplication Methods - With Regrouping

Tens	Ones

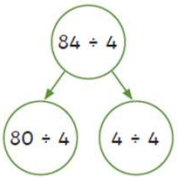
24 × 4 = 96

	T	O
	2	4
×		4
	9	6
	1	

Written Division Methods - No Regrouping

Tens	Ones

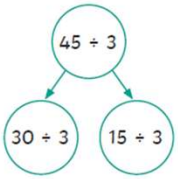
	2	1
4	8	4



Written Division Methods - With Regrouping

Tens	Ones

	1	5
3	4	15



Multiplication and Division: Stage 4

Multiplication and Division — Knowledge Organiser

Key Vocabulary

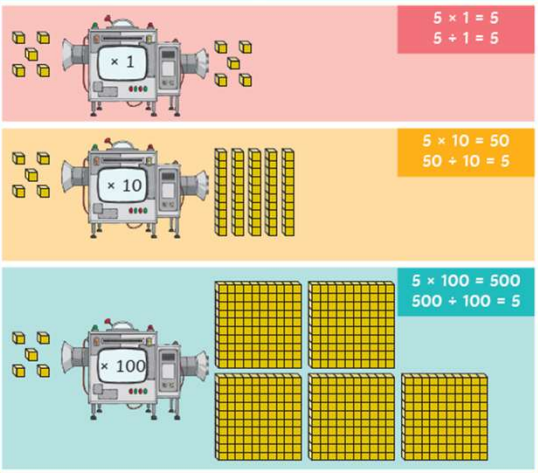
- multiply
- groups of
- lots of
- times
- divide
- share
- remainder
- factor
- multiple
- product

twinkl visit twinkl.com

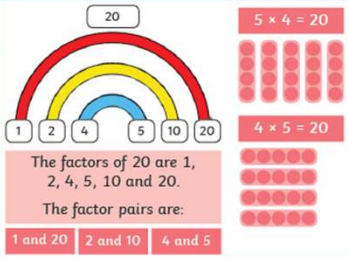
Multiplication and Division Facts

×	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Use Place Value to Multiply and Divide Mentally



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 × 4 = 20

4 × 5 = 20

Multiply Using Formal Written Methods

Th	H	T	O	
	5	4	3	
×			4	
		1	2	(4 × 3)
	1	6	0	(4 × 40)
2	0	0	0	(4 × 500)
2	1	7	2	

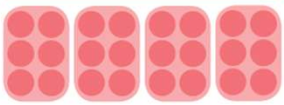
Th	H	T	O
	5	4	3
×			4
2	1	7	2
	1	1	

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

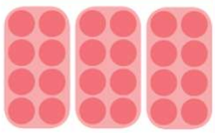
Multiplication and Division — Knowledge Organiser

Mental Calculations for Solving Problems

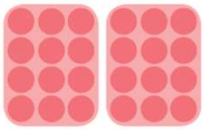
(2 × 3) × 4 = 24

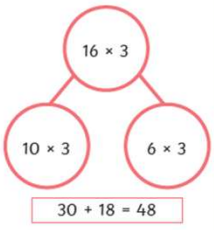


(2 × 4) × 3 = 24



(3 × 4) × 2 = 24





Integer Scaling Problems

10 pencils

10 x 4 = 40 pencils

75g

75g × 2 = 150g

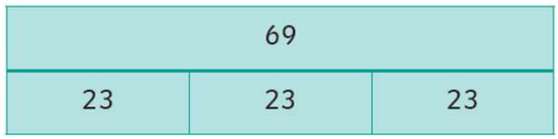
Short Division with Exact Answers

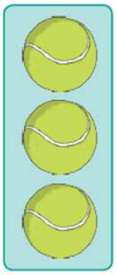
There are 69 tennis balls packed in tubes of 3.

There are 23 tubes altogether.

69 ÷ 3 = 23

$$3 \overline{)\,69}\quad 23$$





twinkl visit twinkl.com

Number and Place 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

twinkl visit twinkl.com

3-Digit Numbers

256

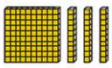
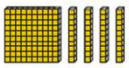
two hundred	fifty	six
		
200	50	6

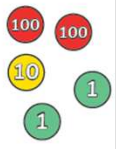
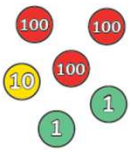
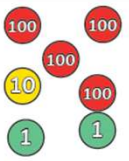
Counting in 4s and 8s

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		Ten More
		
120	130	140

One Hundred Less		One Hundred More
		
212	312	412

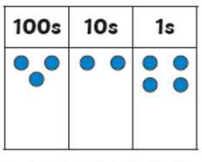
Counting in 50s and 100s

0	50	100	150	200	250	300	350	400	450	500

0	100	200	300	400	500	600	700	800	900	1000

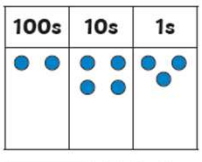
Number and Place Value — Knowledge Organiser

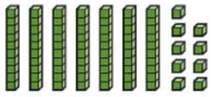
Compare and Order



324 > 243

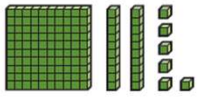
greater than





79 < 126

less than



smallest

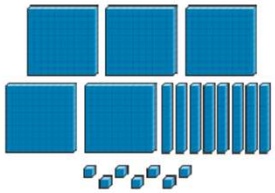
greatest

Represent Numbers to 1000

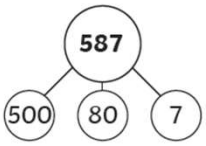
587

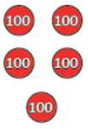
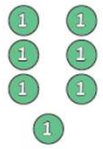
five hundred and eighty-seven

Hundreds	Tens	Ones
		

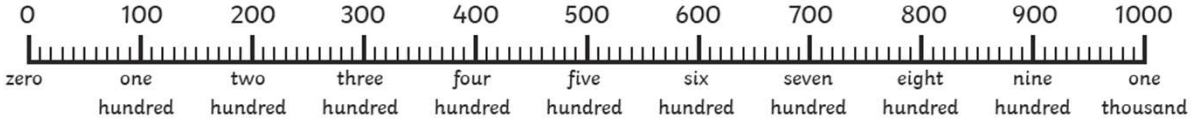


500 + 80 + 7



Hundreds	Tens	Ones
		

Numerals and Words to 1000



twinkl visit twinkl.com

Number and Place Value: Stage 4

Number and Place Value — Knowledge Organiser

Key Vocabulary

- thousands
- hundreds
- tens
- ones
- zero
- place value
- greater than
- less than
- order
- round
- rounded to
- negative number
- partition
- digit
- Roman numeral

twinkl visit twinkl.com

Counting

Counting in 6s

0	6	12	18	24	30	36	42	48	54	60

Counting in 7s

0	7	14	21	28	35	42	49	56	63	70

Counting in 9s

0	9	18	27	36	45	54	63	72	81	90

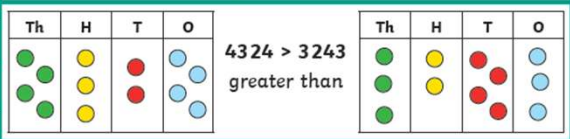
Counting in 25s

0	25	50	75	100	125	150	175	200	225	250

Counting in 1000s

0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10 000

Compare and Order



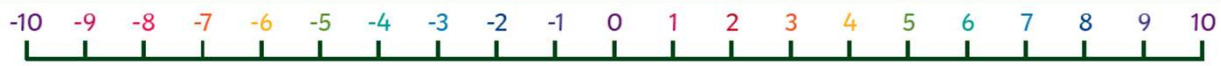
2497	2508	3012	3521	3530	4002

smallest — greatest

1000 More or 1000 Less

Number and Place Value — Knowledge Organiser

Negative Numbers

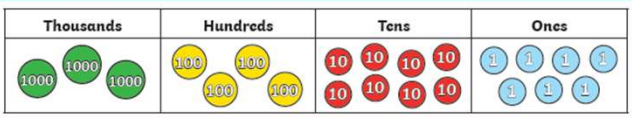


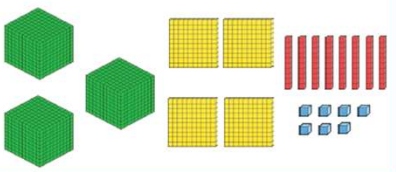
Represent 4-Digit Numbers

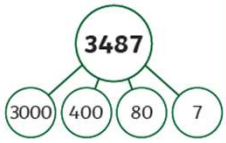
3487

three thousand, four hundred and eighty-seven

1000s	100s	10s	1s
III	IIII	𝍸 III	𝍸 II







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

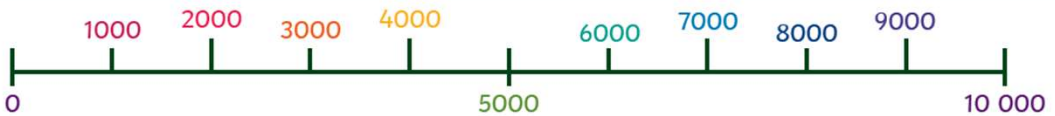
round down — round up

Rounding to the nearest 1000

2000	2499	2500	3000

round down — round up

twinkl visit twinkl.com



Money: Stage 3

Money — Knowledge Organiser

Key Vocabulary

- amount
- change
- coin
- combinations
- convert
- note
- pence
- penny
- pounds
- value

UK Coins

1p	2p	5p	10p	20p	50p	£1	£2
one penny coin	two pence coin	five pence coin	ten pence coin	twenty pence coin	fifty pence coin	one pound coin	two pound coin

UK Notes

£5	£10	£20	£50
five pound note	ten pound note	twenty pound note	fifty pound note

Pounds and Pence

£3 and 25 pence

£52 and 13 pence

Convert Pounds and Pence

120 pence
100 pence is £1
120 pence is £1 and 20 pence.

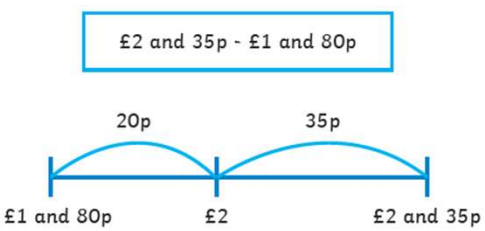
Money — Knowledge Organiser

Adding Amounts

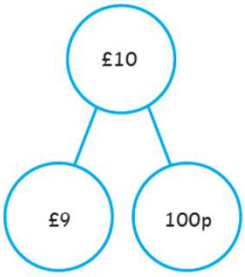
?	
£1 and 60p	

£1 and 60p + £1 and 52p
There is £2 and 112p.
112p is £1 and 12p
Altogether there is £3 and 12p.

Subtracting Amounts



Giving Change



£9 - £5 = £4
100p – 67p = 33p
£4 and 33p change

Money: Stage 4

Money — **Knowledge Organiser**

Key Vocabulary

amount
change
combinations
estimate
decimal
pence
penny
pounds
round
value
convert

UK Coins

£0.01	£0.02	£0.05	£0.10	£0.20	£0.50	£1.00	£2.00
one penny coin	two pence coin	five pence coin	ten pence coin	twenty pence coin	fifty pence coin	one pound coin	two pound coin

UK Notes

£5 five pound note

£10 ten pound note

£20 twenty pound note

£50 fifty pound note

Pounds and Pence

£3 and 25 pence **£3.25**

£52 and 13 pence **£52.13**

463 = £4.63

705p = £7.05

92p = £0.92

Money — **Knowledge Organiser**

Ordering Money

We can compare or order amounts by changing all amounts to either pounds or pence.

£4.82 ☐ 428p

£4.82 = 482p

482p > 428p

£4.82 > 428p

Order in ascending order:

516p 156p £1.65 £6.51

£1.65 = 165p and £6.51 = 651p

156p, £1.65, 516p, £6.51

Estimating Money

That's about £8.

£7.00 £7.50 £8.00

That's about £4.

£4.00 £5.00

We can use estimates when calculating.

They are about £3 and £7 so will be about £10 in total.

They are about £4 and £3 so will be about £7 in total. I will have about £3 left.

Properties of Shape: Stage 3

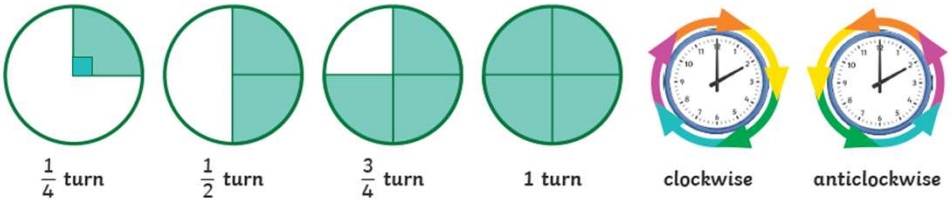
Properties of Shapes — Knowledge Organiser

Key Vocabulary

- quarter 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

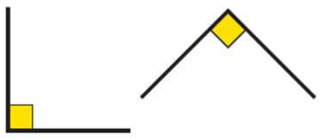
Turns and Angles

Angles can be used as a description of a turn.

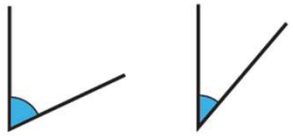


$\frac{1}{4}$ turn | $\frac{1}{2}$ turn | $\frac{3}{4}$ turn | 1 turn | clockwise | anticlockwise

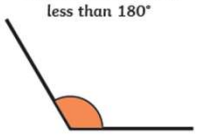
An angle is created when two straight lines meet at a point or intersect.



Right Angle



Acute Angle
Less than 90°



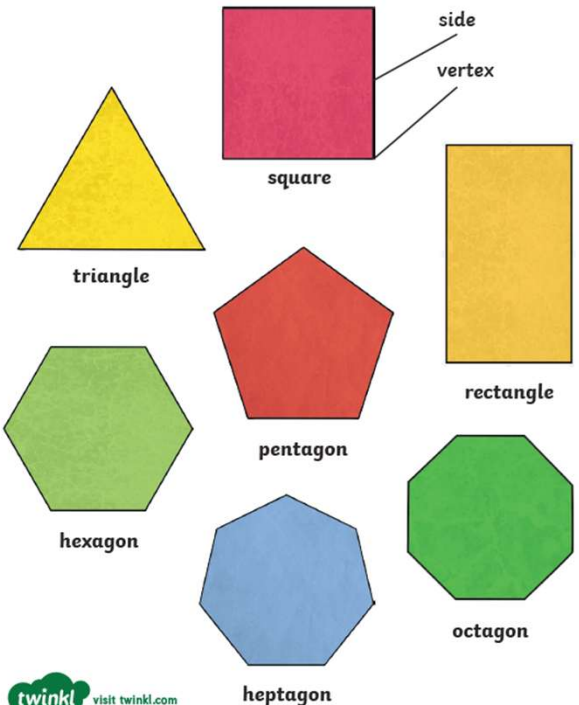
Obtuse Angle
Greater than 90° and less than 180°

Type of Lines

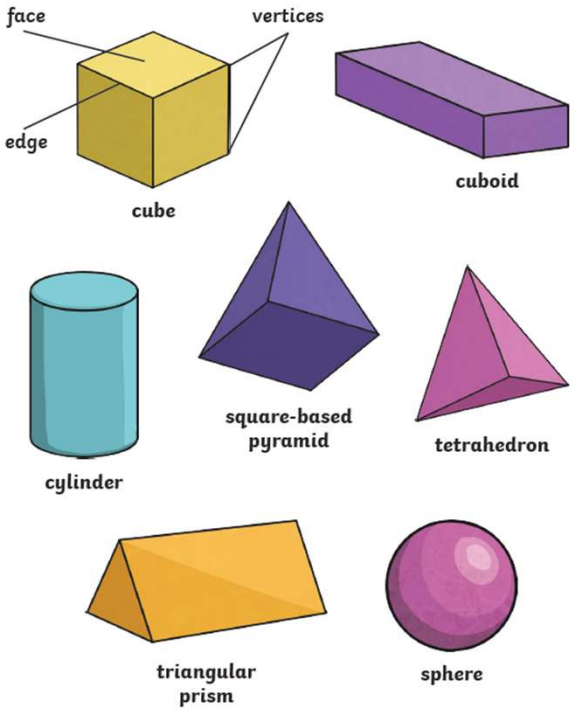
horizontal | vertical | parallel | perpendicular

Properties of Shapes — Knowledge Organiser

Recognise and Describe 2D Shapes



Recognise and Describe 3D Shapes



Properties of Shape: Stage 4

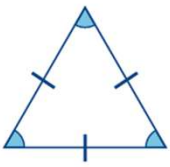
Properties of Shape — Knowledge Organiser

Key Vocabulary

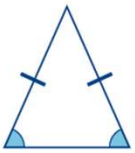
- angle
- right angle
- acute
- obtuse
- horizontal
- vertical
- diagonal
- parallel
- perpendicular
- two-dimensional
- polygon
- line of symmetry
- reflection
- mirror line
- isosceles
- equilateral
- scalene
- quadrilateral
- rhombus
- parallelogram
- trapezium

Triangles

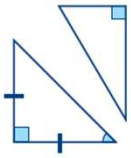
Triangles have 3 sides and 3 vertices. The total of the angles in a triangle is 180°.



An equilateral triangle is a regular polygon. It has sides of equal length and each angle is 60°.

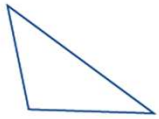


An isosceles triangle has two sides of equal length and two angles of equal size.



A right-angled triangle always has one 90° angle.

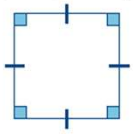
It can be isosceles or scalene.



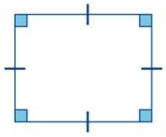
A scalene triangle has no equal sides or angles.

Quadrilaterals

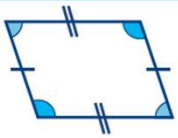
A quadrilateral is a polygon with four sides.



A square has four sides of equal length and four right angles (90°). A square is also a rectangle, a rhombus and a parallelogram.

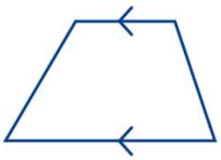


A rectangle has two pairs of parallel, equal sides and four right angles. A rectangle is also a parallelogram.

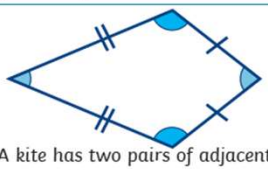


A parallelogram has two pairs of parallel, equal sides and opposite equal angles.

A rhombus has four sides of equal length and opposite equal angles. A rhombus is also a parallelogram.



A trapezium only has one pair of opposite parallel sides.



A kite has two pairs of adjacent equal sides and one pair of opposite equal angles.

Properties of Shape — Knowledge Organiser

Angles

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

Right angle

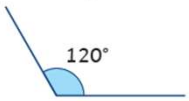
The intersection of perpendicular lines creates a right angle.

Acute angle

Any angle measuring more than 0 degrees and less than 90 degrees is acute.

Obtuse angle

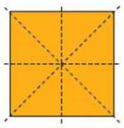
Any angle measuring more than 90 degrees but less than 180 degrees is obtuse.



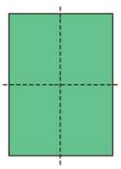
Lines of Symmetry

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.

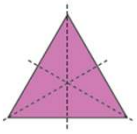
A square has four lines of symmetry.



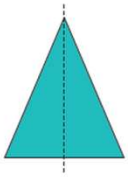
A rectangle has two lines of symmetry.



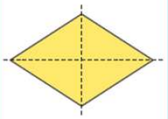
An equilateral triangle has three lines of symmetry.



An isosceles triangle has one line of symmetry.

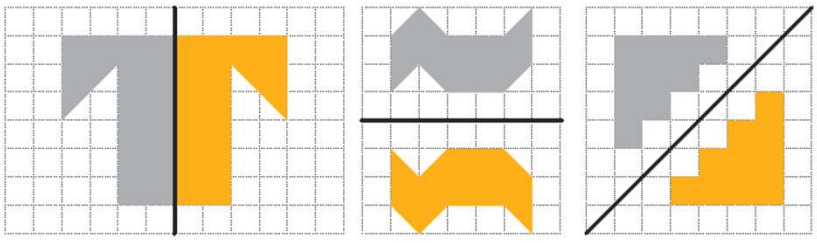


A rhombus has two lines of symmetry.



Symmetric Figures

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



Mass and Capacity: Stage 3

Mass and Capacity — Knowledge Organiser

Key Vocabulary

- mass
- gram
- kilogram
- capacity
- volume
- millilitre
- litre
- lighter
- heavier

Measure and Compare 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'.

Measure and Compare Capacity

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.

Smaller volumes are measured in millilitres.

Millilitres can be written as ml.

Measuring jugs can be used to measure larger volumes.

Greater volumes are measured in litres.

Litres can be written as l.

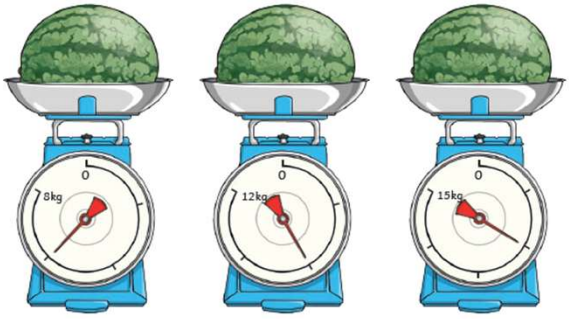
1000ml = 1l

To compare capacities, we can use the word 'full'.

Reading Scales — Knowledge Organiser

Mass

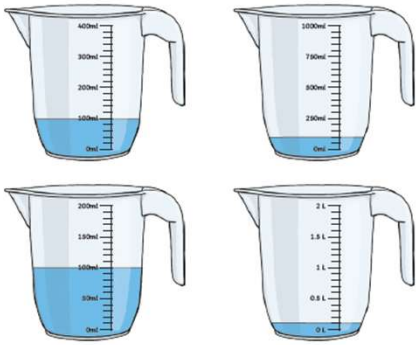
Each of the melons has a mass of 6kg but the arrows are all pointing at different points on the scales. This is because each of the measuring scales have different increments marked on them.



Always look carefully at how the numbers on the scales increase when reading a measurement.

Capacity

Measuring containers all have different capacities.

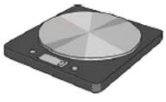


Each of these containers contain the same volume of 100 millilitres but have different capacities and scales. Always look carefully at how the numbers on the scales increase when reading a measurement.

Add and Subtract Mass

600g + 500g = 1100g = **1kg 100g**

1kg - 300g = 1000g - 300g = **700g**



Add and Subtract Capacities

800ml + 400ml = 1200ml = **1l 200ml**

1l 300ml – 200ml = **1l 100ml**