

The following documents are used to provide us with a long term planning structure for teaching and learning over the year. We use the combination alongside our own teacher judgement and remain flexible for several reasons, taking into account:

- The pace of the children’s understanding in line with our whole class teaching for mastery approach
- The small steps and depth of learning required to master certain topics

[Link to white rose](#)

## Year 5 – Yearly Overview

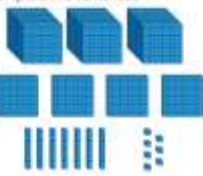
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number – Place Value			Number – Addition and Subtraction		Statistics		Number – Multiplication and Division		Perimeter and Area		Consolidation
Spring	Number – Multiplication and Division			Number – Fractions						Number – Decimals & Percentages		Consolidation
Summer	Number – Decimals				Geometry- Properties of Shapes			Geometry- Position and Direction	Measurement- Converting Units		Measures Volume	Consolidation

NC Learning Objectives: Key Skills

- read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit
- count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000
- interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through 0
- round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000
- solve number problems and practical problems that involve all of the above
- read Roman numerals to 1,000 (M) and recognise years written in Roman numerals

Concrete


Complete the sentences.



There are \_\_\_\_\_ thousands,  
 \_\_\_\_\_ hundreds,  
 \_\_\_\_\_ tens and \_\_\_\_\_ ones.


The number is \_\_\_\_\_.

\_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_




Pictorial

Place Value

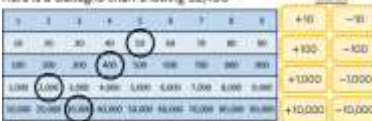


Complete the part-whole model for the number represented.




4,050

Here is a Gattegno chart showing 32,450




Give children a target number to make then let them choose a card. Children then need to adjust their number on the chart.

40,000

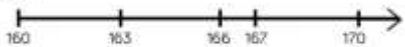


25,000 | 15,000

Which multiples of 10 do the numbers sit between?



Say whether each number on the number line is closer to 160 or 170?



Round 163, 166 and 167 to the nearest 10

Abstract

Read and write numbers to 1million

What is the value of the underlined digit in each number?

6,983      9,021      789      6,570

Start number	Rounded to the nearest 10
851	
XCVIII	

Round 450,985 to the nearest

- 10
- 100
- 1,000
- 10,000
- 100,000



Key Vocabulary:

Thousands, ten thousand, hundred thousand, million digit, Roman numeral place value stands for, represents exchange >, greater than greatest, most, largest, least, fewest, smallest, more/less compare, order, between, half-way estimate approximate, round integer, positive, negative odd, even every other digit next, consecutive sequence, continue, predict pattern, pair, rule relationship sort, classify, property formula divisible (by), divisibility, factor square number

STEM Sentences:

What is the value of the number ....can you explain why?

True—sometimes never always

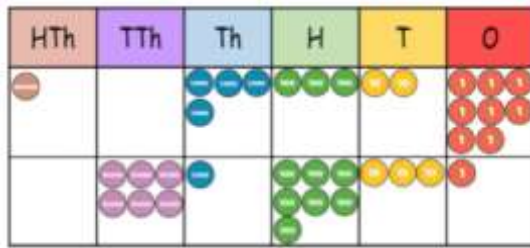
## Additional Knowledge Covered in this area of Maths:

Place in here any additional Knowledge you think appropriate in each element having reviewed the knowledge organiser for your year group for each of the strands of maths.

NC Learning Objectives: Key Skills

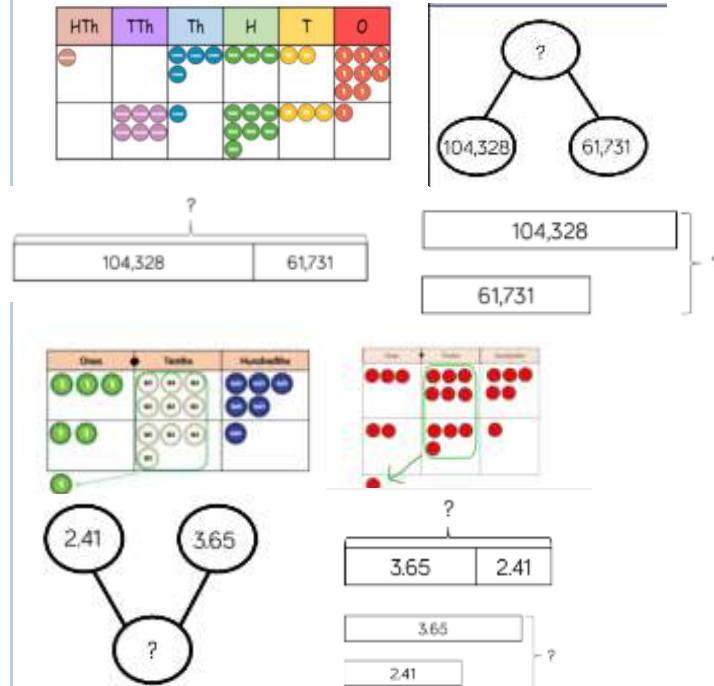
- Add numbers mentally with increasingly large numbers, using and practising a range of mental strategies ie. add the nearest multiple of 10, 100, 100 and adjust; use near doubles, inverse, partitioning and re-combining; using number bonds.
- Use rounding to check answers and accuracy.
- Solve multi-step problems in contexts, deciding which operations and methods to use and why.
- Read, write, order and compare numbers to at least 1 million and determine the value of each digit.
- Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.
- Add numbers with more than 4 digits using formal written method of columnar addition.

Concrete



If needed—use place value chart to place counters on and add moving towards the pictorial representation. Support progression if necessary.

Pictorial



Abstract

1	0	4	3	2	8
+	6	1	7	3	1
1	6	6	0	5	9

$$\begin{array}{r} 3.65 \\ + 2.41 \\ \hline 6.06 \\ 1 \end{array}$$

$$\boxed{3.65 + 2.41 = 6.06}$$

**Key vocabulary:** add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, plus, addition, column, tens boundary, hundreds boundary, increase, “carry”, expanded, compact, vertical, thousands, hundreds, digits, inverse & decimal places, decimal point, tenths, hundredths, thousandths .

**STEM Sentences:**  
 True—sometimes never always  
 Odd + odd is Even—l  
 Even + odd is odd etc

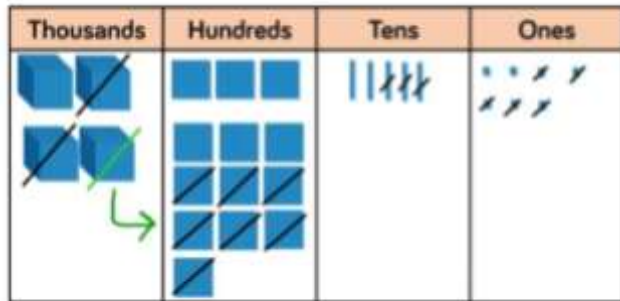
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NC Learning Objectives: Key Skills

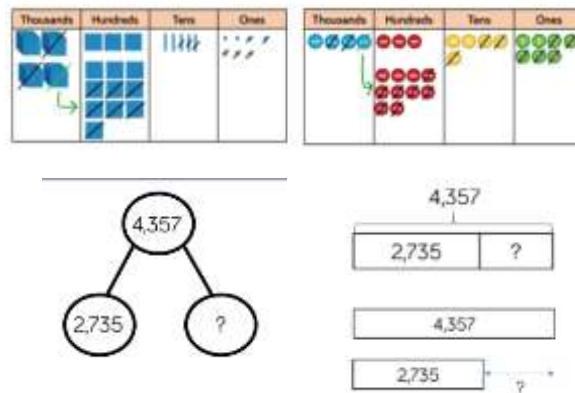
- Subtract numbers mentally with increasingly large numbers.
- Use rounding and estimation to check answers to calculations and determine, in a range of contexts, levels of accuracy.
- Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why.
- Read, write, order and compare numbers to at least 1 million and determine the value of each digit.
- Count forwards or backwards in steps of powers of 10 for any given number up to 1 million.
- Interpret negative numbers in context, counting forwards and backwards with positive and negative integers through 0.
- Round any number up to 1 million to the nearest 10, 100, 1000, 10 000 and 100 000.

Concrete



Model as necessary with diennes as and if necessary.

Pictorial



Abstract

$$\begin{array}{r} 3 \ 1 \\ 4357 \\ - 2735 \\ \hline 1622 \end{array}$$

$$4,357 - 2,735 = 1,622$$

**Key vocabulary:** equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer / less than, most, least, count back, how many left, how much less is\_? difference, count on, strategy, partition, tens, units exchange, decrease, hundreds, value, digit, inverse, tenths, hundredths, decimal point, decimal

**STEM Sentences:**

True—sometimes never always

When adding powers of ten the next column changes when a boundary is passed- T/F

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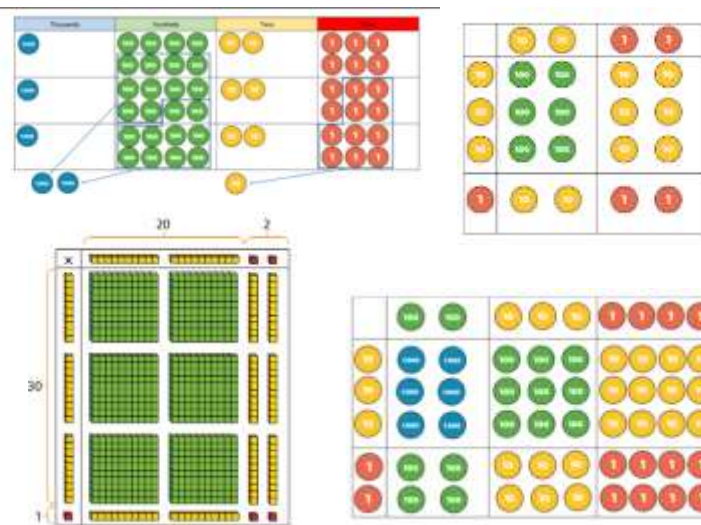
- NC Learning Objectives:
- Identify multiples and factors, using knowledge of multiplication tables to 12x12.
- Solve problems where larger numbers are decomposed into their factors.
- Multiply and divide integers and decimals by 10, 100 and 1000.
- Recognise and use square and cube numbers and their notation.
- Solve problems involving combinations of operations, choosing and using calculations and methods appropriately.

**Concrete**



Use with counters and place value chart as necessary to concrete concept.

**Pictorial**



**Abstract**

$1,826 \times 3 = 5,478$

	Th	H	T	O
	1	8	2	6
x				3
	5	4	7	8

$22 \times 31 = 682$

x	20	2
30	600	60
1	20	2

	H	T	O
		2	2
x		3	1
		2	2
	6	6	0
	6	8	2

x	200	30	4
30	6,000	900	120
2	400	60	8

$234 \times 32 = 7,488$

	Th	H	T	O
		2	3	4
x		3	2	
		4	6	8
1	7	0	2	0
7	4	8	8	

**Key vocabulary:** groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, commutative, sets of, equal groups, \_times as big as, once, twice, three times..., partition, grid method, total, multiple, product, inverse, square, factor, integer, decimal, short/long multiplication, 'carry'

**STEM Sentences:**  
 True—sometimes never always  
 Sam says an even number x an even numbers is always an even number—do you agree?  
 Jo says an odd number x odd number is always and odd number—do you agree?



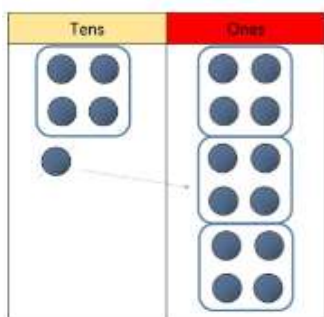
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NC Learning Objectives/Key skills:

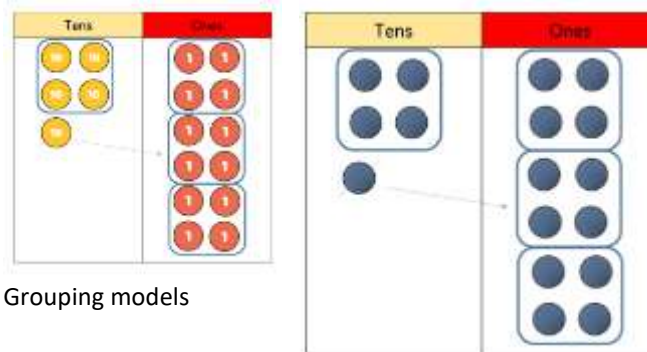
- Recall multiplication and division facts for all numbers up to 12 x 12 (as in Y4).
- Multiply and divide numbers mentally, drawing upon known facts.
- Identify multiples and factors, including finding all factor pairs of a number, and common factors of two number.
- Solve problems involving multiplication and division where larger numbers are decomposed into their factors.
- Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.
- Use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.
- Work out whether a number up to 100 is prime, and recall prime numbers to 19.
- Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context
- Use multiplication and division as inverses.
- Interpret non-integer answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding (e.g.  $98 \div 4 = 24 \text{ r } 2 = 24\frac{1}{2} = 24.5 \approx 25$ ).
- Solve problems involving combinations of all four operations, including understanding of the equals sign, and including division for scaling by different fractions and problems involving simple rates.

Concrete



Model with counters as necessary.

Pictorial



Grouping models

Abstract

$$52 \div 4 = 13$$

Short division:

		1	3	
	4	5	12	

**Key Vocabulary:** share, share equally, one each, two each..., group, equal groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, short division, 'carry', remainder, multiple, divisible by, factor, inverse, quotient, prime number, prime factors, composite number (non-prime)

**STEM Sentences:**

True—sometimes never always

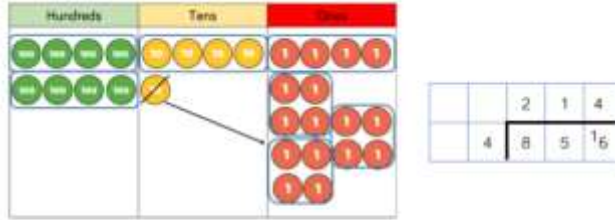
When I divide by a number the answer is always smaller than the number?

**Concrete**

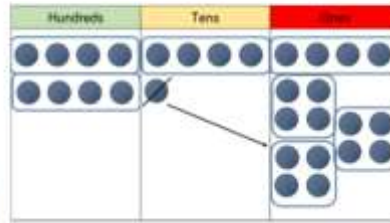
Use counters with place value grid as necessary.

**Pictorial**

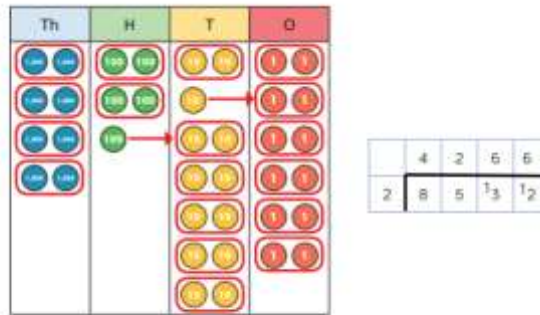
Grouping into sharing models:



$$856 \div 4 = 214$$



$$8,532 \div 2 = 4,266$$



**Abstract**

		2	1	4
	4	8	5	16

$$856 \div 4 = 214$$

		4	2	6	6
2	8	5	13	12	

$$8,532 \div 2 = 4,266$$

**Additional Knowledge Covered in this area of Maths:**

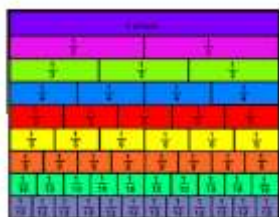
Place in here any additional Knowledge you think appropriate in each element having reviewed the knowledge organiser for your year group for each of the strands of maths.

NC Learning Objectives:

- compare and order fractions whose denominators are all multiples of the same number
- identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
- recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements  $> 1$  as a mixed number [for example,  $2/5 + 4/5 = 6/5 = 1 \frac{1}{5}$ ]
- add and subtract fractions with the same denominator, and denominators that are multiples of the same number
- multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
- read and write decimal numbers as fractions [for example,  $0.71 = 71/100$ ]
- recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
- round decimals with 2 decimal places to the nearest whole number and to 1 decimal place
- read, write, order and compare numbers with up to 3 decimal places
- solve problems involving number up to 3 decimal places
- recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per 100', and write percentages as a fraction with denominator 100, and as a decimal fraction
- solve problems which require knowing percentage and decimal equivalents of  $1/2$ ,  $1/4$ ,  $1/5$ ,  $2/5$ ,  $4/5$  and those fractions with a denominator of a multiple of 10 or 25

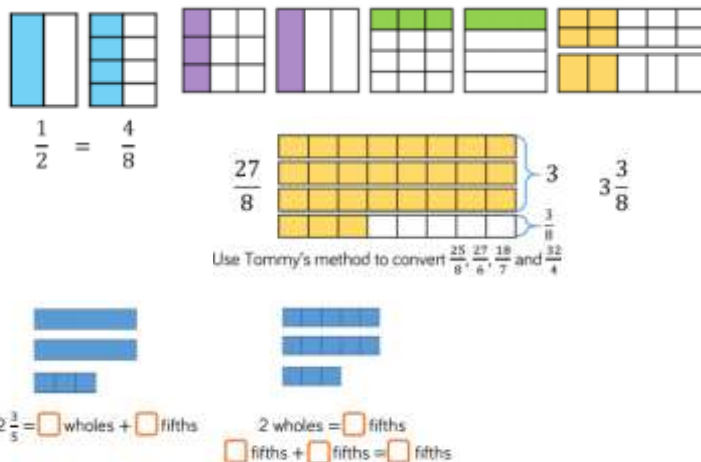
Concrete

Fraction wall and fractions sticks.



Pictorial

Equivalent fractions.



Abstract

Use this method to find equivalent fractions to  $\frac{2}{4}$ ,  $\frac{3}{4}$  and  $\frac{4}{4}$  where the denominator is 16

$\frac{1}{4} \times 4 = \frac{4}{16}$

Key Vocabulary:

numerator denominator unit fraction non-unit fraction whole equivalent mixed number improper fraction simplest form multiple common denominator common numerator tenths, hundredths, decimal tenths, decimal hundredths, decimal equivalence, part whole model, decimal point, place value

STEM Sentences:

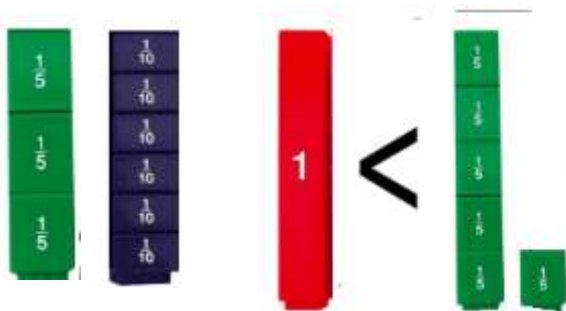
True—sometimes never always  
The denominator is always bigger than the numerator in a fraction...

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Concrete

Fraction wall and fractions sticks.

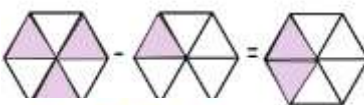
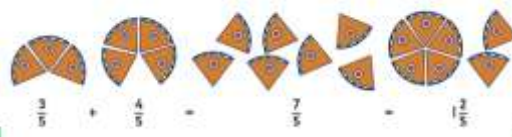
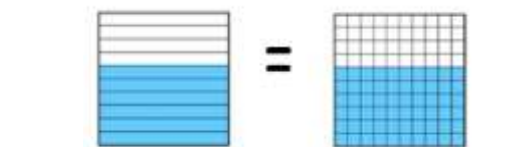


$$\frac{8}{20} + \frac{5}{20} = \frac{13}{20}$$

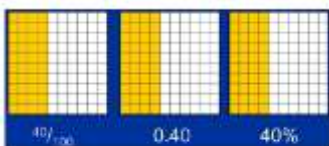
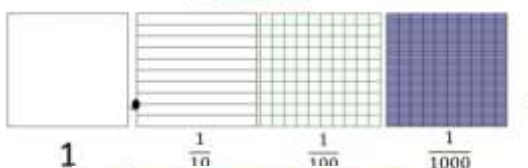
$$\frac{2}{5} + \frac{1}{4} = \frac{13}{20}$$



Pictorial



6 lots of  $\frac{3}{4}$        $4\frac{2}{4}$  altogether



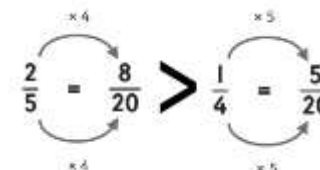
Abstract

$$\frac{6}{10} = \frac{60}{100}$$

$$\frac{3}{5} = \frac{6}{10} = \frac{60}{100}$$

$$\frac{3}{4} = \frac{75}{100}$$

$$\frac{1}{5} = \frac{2}{10} = \frac{20}{100}$$



$$\frac{7}{2} = 3\frac{1}{2}$$

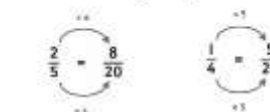
because  $7 \div 2 = 3$  with 1 half left over

$$2\frac{1}{3} = \frac{7}{3}$$

because  $2 \times 3 = 6$  with 1 third left to add

$$\frac{3}{4} \times 6 = \frac{18}{4} = 4\frac{2}{4}$$

$$\frac{2}{5} - \frac{1}{4}$$



67.153

How many thousandths does this number have? How many more thousandths do you need to add to make 67.16?

$$\frac{8}{20} - \frac{5}{20} = \frac{3}{20}$$

$$\frac{2}{5} - \frac{1}{4} = \frac{3}{20}$$

$$\frac{4}{10} = 40\% = 0.4$$

$$\frac{32}{100} = 32\% = 0.32$$

$$\frac{75}{100} = 75\% = 0.75$$

$$\frac{2}{25} = \frac{8}{100} = 8\% = 0.08$$

Key Vocabulary:

numerator denominator unit fraction non-unit fraction whole equivalent mixed number improper fraction simplest form multiple common denominator common numerator tenths, hundredths, decimal tenths, decimal hundredths, decimal equivalence, part whole model, decimal point, place value

STEM Sentences:

The answer when two fractions are multiplied is always smaller...  
The answer when you multiply a number by a fraction is always smaller ..



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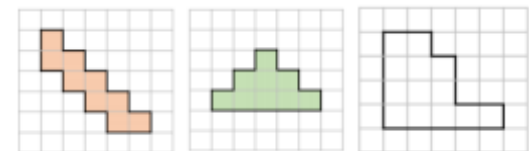
NC Learning Objectives:

- convert between different units of metric measure [for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre]
- understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints
- measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres
- calculate and compare the area of rectangles (including squares), including using standard units, square centimetres (cm<sup>2</sup>) and square metres (m<sup>2</sup>), and estimate the area of irregular shapes
- estimate volume [for example, using 1 cm<sup>3</sup> blocks to build cuboids (including cubes)] and capacity [for example, using water]
- solve problems involving converting between units of time
- use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling

Concrete

Squared paper—perimeter count cm squares around shapes

Area count cm squares covered.

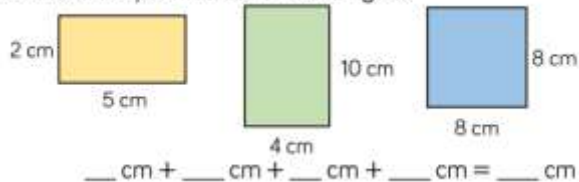


Pictorial

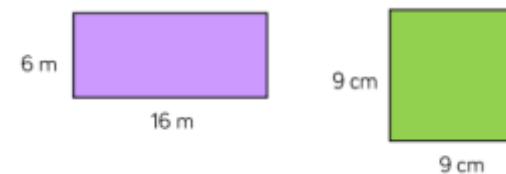
Calculate the perimeter of the shapes.



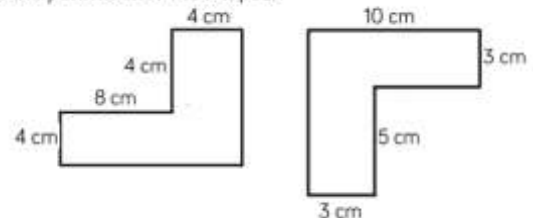
Calculate the perimeter of the rectangles.



Abstract



Find the perimeter of the shapes.



**Key Vocabulary:** unit, standard unit metric unit, imperial unit measuring scale, estimate approximately perimeter kilometre (km), metre (m), centimetre (cm), millimetre (mm) mile ruler, metre stick, tape squared (cm<sup>2</sup>) (m<sup>2</sup>) (mm<sup>2</sup>) kilogram (kg), half-kilogram, gram (g) litre (l), half-litre, millilitre (ml) pint area, covers, surface leap year, century, millennium am, pm, noon, midnight 24-hour, 12-hour o'clock, half past, quarter to, quarter past clock, watch, hands digital/analogue clock/watch, timer price, cost buy, bought, sell, sold spend, spent, change total, amount, value, discount, currency

**STEM Sentences:**

How many rectangle can you draw with a perimeter of 24 cm  
The perimeter of a square is always 4 x one side..

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- calculate and compare the area of rectangles (including squares), including using standard units, square centimetres (cm<sup>2</sup>) and square metres (m<sup>2</sup>), and estimate the area of irregular shapes
- estimate volume [for example, using 1 cm<sup>3</sup> blocks to build cuboids (including cubes)] and capacity [for example, using water]
- solve problems involving converting between units of time
- use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling

Concrete



Pictorial

**Volume Conversion:**

- 1000 ml = 1 litre
- 1 l = 0.2 l = 200 ml
- 1 l = 0.25 l = 250 ml
- 1 l = 0.5 l = 500 ml
- 2 l = 0.5 l = 500 ml
- 1 ml = 0.001 l = 1000 ml

**Mass Conversion:**

- 1000 g = 1 kg
- 1 kg = 1000 g
- 1 kg = 0.5 kg = 500 g
- 1 kg = 0.25 kg = 250 g
- 1 kg = 0.1 kg = 100 g

**Length Conversion:**

- 1 km = 1000 m
- 1 m = 100 cm
- 1 cm = 10 mm
- 1 km = 1000 m
- 1 m = 100 cm
- 1 cm = 10 mm

**Bus Timetable:**

Route	05:05	06:05	07:05	07:45	08:15
Huller Bus Station					
Shelf Roundabout	06:15	06:45	07:15	07:51	08:51
Shelf Village Hall	06:40	06:46	07:55	08:00	08:53
Wickhale	06:31	06:09	08:38		
Ditch	06:26	06:59	07:33	07:45	08:41
Bradford Interchange	06:40	07:10	07:48	08:30	09:00

Abstract

$\frac{1}{1,000} \text{ m} = \square \text{ mm}$      $\frac{1}{100} \text{ m} = \square \text{ mm}$      $\frac{1}{10} \text{ m} = \square \text{ mm}$

$3 \text{ l} + \frac{1}{4} \text{ l} = \square \text{ ml}$      $2 \text{ l} + \square \text{ ml} = 2,500 \text{ ml}$

Compare the measurements using <, > or =

2 l ○ 1,500 ml      60 l ○ 6,000 ml

2.8 m ○ 280 mm      3,700 m ○ 3.7 mm

Is the time to get from Shelf Roundabout to Bradford Interchange the same for every bus?  
Why might the time not always be the same?  
Why are some of the times blank?

**Key Vocabulary:** unit, standard unit metric unit, imperial unit measuring scale, estimate approximately perimeter kilometre (km), metre (m), centimetre (cm), millimetre (mm) mile ruler, metre stick, tape squared (cm<sup>2</sup>) (m<sup>2</sup>) (mm<sup>2</sup>) kilogram (kg), half-kilogram, gram (g) litre (l), half-litre, millilitre (ml) pint area, covers, surface leap year, century, millennium am, pm, noon, midnight 24-hour, 12-hour o'clock, half past, quarter to, quarter past clock, watch, hands digital/analogue clock/watch, timer price, cost buy, bought, sell, sold spend, spent, change total, amount, value, discount, currency

STEM Sentences:

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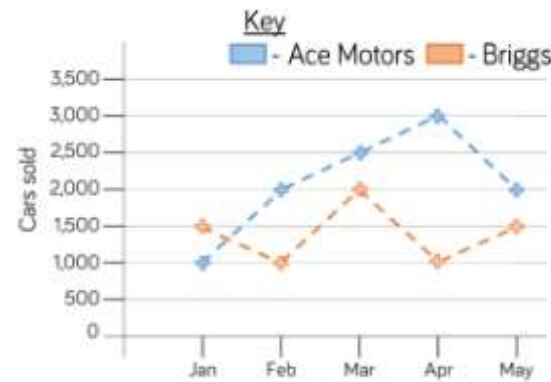
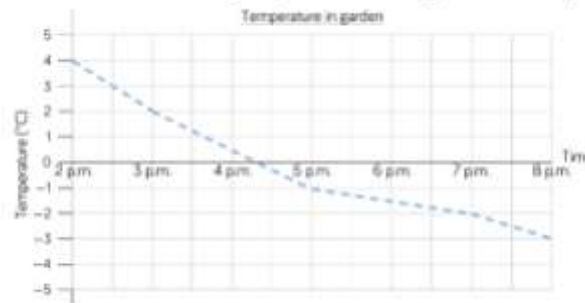
NC Learning Objectives/Key Skills

- solve comparison, sum and difference problems using information presented in a line graph
- complete, read and interpret information in tables, including timetables

Concrete

Pictorial

Abstract

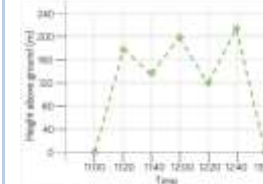


Complete the graph using the information from the table.



Rosie has used the data in the table to plot the line graph.

Time	11:00	11:30	11:45	12:00	12:30	12:45	13:00
Height above ground (m)	0	180	160	200	200	100	0



What mistakes has Rosie made?  
Can you draw the line graph correctly?

This two-way table shows the staff at Liverpool police station.

	Male	Female	Total
Constable	66	24	90
Sergeant	8	5	13
Inspector	2	4	6
Chief Inspector	1	1	2
Total	66	34	100

- How many female inspectors are there?
- How many male sergeants are there?
- How many constables are there altogether?
- How many people work at Liverpool police station?
- How many male inspectors and female constables are there altogether?

Key Vocabulary:

Interpret data Present data Read data Bar Charts Pictograms Axis, Scale tally, sort, vote survey, questionnaire, graph, block graph, tally chart table, frequency Carroll diagram, Venn diagram label, title, most popular, most common least popular, least common, line graph bar line chart fair, unfair likely, unlikely, likelihood certain, uncertain probable, possible impossible risk, doubt maximum/minimum value classify, outcome

STEM Sentences:

## Additional Knowledge Covered in this area of Maths:

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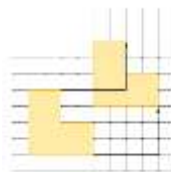
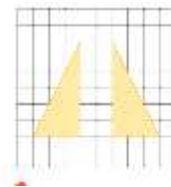
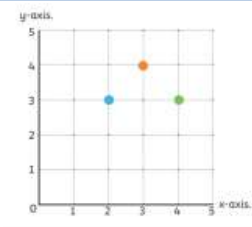
NC Learning Objectives:

- identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed
- identify 3-D shapes, including cubes and other cuboids, from 2-D representations
- know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
- draw given angles, and measure them in degrees ( $^{\circ}$ )
  - identify:
- angles at a point and 1 whole turn (total  $360^{\circ}$ )
- angles at a point on a straight line and half a turn (total  $180^{\circ}$ )
- other multiples of  $90^{\circ}$

Concrete

Pictorial

Abstract



Coordinates are a useful way to locate a position on a map or grid.  
 The numbers across the horizontal line of the grid are on the **x-axis**.  
 The numbers on the vertical line of the grid are on the **y-axis**.  
 We always read or write the number on the x-axis before the y-axis.  
 The x and y position are written in brackets with a comma.  
 The coordinate of the orange spot is **(3, 4)**

Key Vocabulary:

Flat, line curved, straight face, side, edge, end construct, centre, radius, diameter angle, right-angled vertex, vertices regular, irregular concave, convex congruent 3D shape names sphere, hemi-sphere, spherical 2D shape names equilateral triangle, isosceles triangle, scalene triangle, symmetrical, line of symmetry, reflection, reflect x-axis, y-axis pattern, repeating pattern, translation ascend, descend grid, row, column origin, coordinates clockwise, anti-clockwise compass point, horizontal, vertical, diagonal whole turn, half turn, quarter turn, rotate angle, right angle degree

STEM Sentences:

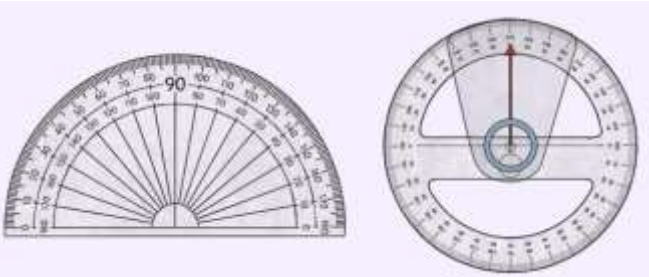
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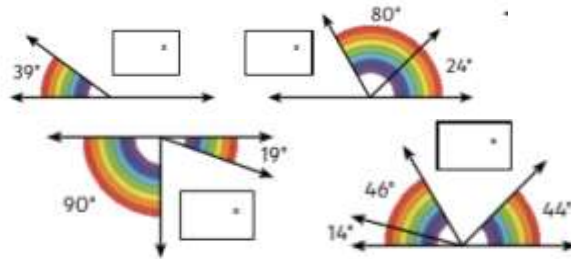
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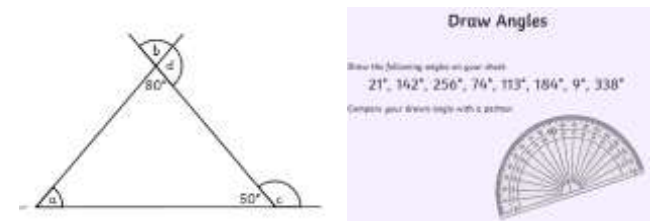
Concrete



Pictorial



Abstract



Key Vocabulary:

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STEM Sentences:

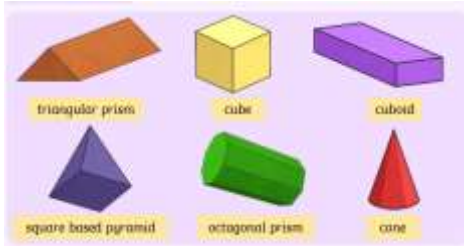
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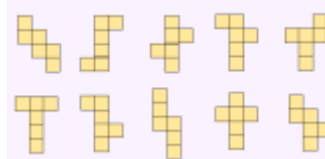
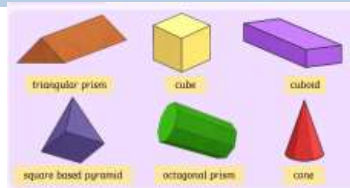
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Concrete

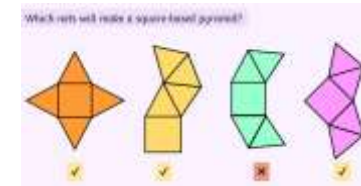


Use physical shapes.

Pictorial



Abstract



Key Vocabulary:

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STEM Sentences:

There are 7 possible nets of a cube..

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