Year 3 Maths

Counting	
Objectives	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward
	find 10 or 100 more or less than a given number
Reasoning	**Spot the mistake**: 50,100,115,200 What is wrong with this sequence of numbers?
	True or False? 38 is a multiple of 8?
	What comes next? 936-10= 926 926 -10 = 916 916- 10= 906 …….
Vocabulary	multiples arrays Count forwards Count backwards
Resources / models	arrays numberlines number squares rhyming – visual videos

Comparing numbers	
Objectives	compare and order numbers up to 1 000
Reasoning	**Do, then explain** 835 535 538 388 508 If you wrote these numbers in order starting with the smallest, which number would be third? Explain how you ordered the numbers.
Vocabulary	order larger smaller greater than less than equal to

Models/ Resources	numberlines

IDENTIFYING, REPRESENTING AND ESTIMATING NUMBERS	
Objectives	identify, represent and estimate numbers using different representations
Vocabulary	Exact Exactly Estimate represent
Resources / models	Dienes Counters Cubes Number track Number line Place value grids

READING AND WRITING NUMBERS (including Roman Numerals)	
Objectives	read and write numbers up to 1000 in numerals and in words
	tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks (copied from Measurement)
Vocabulary	Copy, Sequence, order Ones, tens, hundreds, thousands, digit, the same number as, as many as more, larger, bigger, greater, fewer, smaller, less, fewest, smallest, least most, biggest, largest, greatest, one more, ten more, one hundred more, one less, ten less, one hundred less, equal to, compare, order, size, first, second, third… twentieth, hundredth, last, last but one, before, after, next, between, half-way between, above, below
Resources / models	Digit cards Number tracks Number lines Numicon Dienes

UNDERSTANDING PLACE VALUE	
Objectives	recognise the place value of each digit in a three-digit number (hundreds, tens, ones)

Reasoning	**Do, then explain** Show the3 value of the digit 3 in these numbers? 341 503 937 Explain how you know.
	Make up an example Create numbers where the digit sum is three. Eg 120, 300, 210 What is the largest/smallest number?
Vocabulary	Ones / units Tens hundreds one-, two-, or three-digit number place, place value stands for, represents exchange twenty-first, twenty-second… digits hundreds thousands
Resources / models	Dienes Place value chart Cubes Numicon

PROBLEM SOLVING	
Objectives	solve number problems and practical problems involving these ideas.
Reasoning	True / false Explain Identify Odd one out

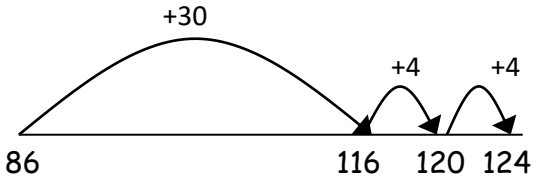
MENTAL CALCULATION	
Objectives	add and subtract numbers mentally, including: a three-digit number and ones a three-digit number and tens a three-digit number and hundreds

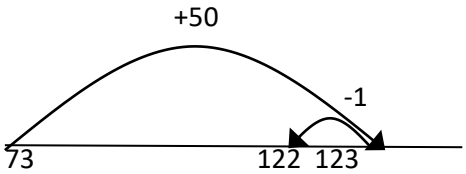
Reasoning	**True or false?** Are these number sentences true or false?597 + 7 = 614 804 – 70 = 744 768 + 140 = 908 Give your reasons.
	Hard and easy questions Which questions are easy / hard? 323 + 10 = 393 + 10 = 454 - 100 = 954 - 120 = Explain why you think the hard questions are hard?
Vocabulary	Add Subtract Count on Count back Greater then Less than
Resources / models	Numberline Empty numberline Dienes Number square

WRITTEN METHODS	
Objective	add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction
	solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.
Reasoning	**Convince me**  The total is 201 Each missing digit is either a 9 or a 1. Write in the missing digits. Is there only one way of doing this or lots of ways? Convince me

<table>
<tr><td>Vocabulary</td><td colspan="2">add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, ones, partition, addition, column ,tens boundary

hundreds boundary, increase, vertical, 'carry', expanded, compact</td></tr>
<tr><td rowspan="4">Resources / models</td><td>38 + 86 = 124

 
</td><td>Children will continue to use empty number lines with increasingly large numbers, including compensation where appropriate.
Count on from the largest number irrespective of the order of the calculation</td></tr>
<tr><td>49 + 73 = 122

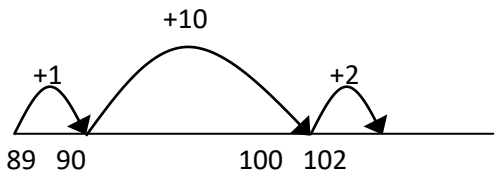
 
</td><td>Rounding and adjusting</td></tr>
<tr><td>34 + 23 = 57

30 + 4
20 + 3
50 + 7 = 57</td><td>Children will move onto columnar addition. They will initially be supported in this by using practical equipment</td></tr>
<tr><td>6 7
+ 2 4
80 (60 +20)
11 (7 +4)
9 1

6 7
+ 2 4
11 (7 +4)
80 (60 +20)
9 1</td><td>Children will start to add the most significant numbers first, which is how we solve the calculations in our head.

The children will quickly move on to adding the least significant digit first.</td></tr>
<tr><td>Vocabulary</td><td colspan="2">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</td></tr>
</table>

Subtraction Resources / models		Children will continue to use the empty numberline with increasingly larger numbers
	102 – 89 = 13  	**Counting on**. If the numbers in a calculation are close together or near to a multiple of 10, 100 etc. children can use the counting on method. Starting from the smallest number and counting up to the largest number. Finding out how many are in between.
	80 + 9 - 50 + 7 30 + 2	Children will use **partitioning**. They will use place value cards and hundreds, tens and units practical apparatus to help them see the numbers. Children will not exchange at first.
	74 – 27 = 70 + 4 - 20 + 7 60 14 ~~70~~ + 4 - 20 + 7 40 + 7	This will lead to exchanging whilst set out in columns.

INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS	
Objectives	estimate the answer to a calculation and use inverse operations to check answers
Reasoning	**Making an estimate** Which of these number sentences have the answer that is between 50 and 60 174 - 119 333 – 276 932 - 871

	Always, sometimes, never Is it always, sometimes or never true that if you subtract a multiple of 10 from any number the units digit of that number stays the same. Is it always, sometimes or never true that when you add two numbers together you will get an even number
Vocabulary	Inverse Calculate Estimate

MULTIPLICATION & DIVISION FACTS	
Objectives	*count from 0 in multiples of 4, 8, 50 and 100* (copied from Number and Place Value)
	recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
Reasoning	**Missing numbers** 24 = ☐ x ☐ Which pairs of numbers could be written in the boxes?
	Making links Cards come in packs of 4. How many packs do I need to buy to get 32 cards?

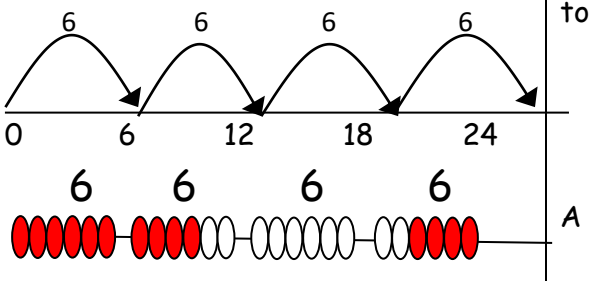
MULTIPLICATION & DIVISION Mental calculations	
Objectives	write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Written Methods)
Reasoning	**Use a fact** 20 x 3 = 60. Use this fact to work out 21 x 3 = 22 x 3 = 23 x 3 = 24 x 3 =
	Making links 4 × 6 = 24 How does this fact help you to solve these calculations? 40 x 6 = 20 x 6 = 24 x 6 =
Vocabulary	array Commutative

<table>
<tr><th colspan="2">MULTIPLICATION & DIVISION Written Calculations</th></tr>
<tr><td rowspan="3">Objectives</td><td>write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Mental Methods)</td></tr>
<tr><td>estimate the answer to a calculation and use inverse operations to check answers (copied from Addition and Subtraction</td></tr>
<tr><td>solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects</td></tr>
<tr><td rowspan="5">Reasoning</td><td>Prove It
What goes in the missing box?
<table><tr><td>x</td><td>?</td><td>?</td></tr><tr><td>4</td><td>80</td><td>12</td></tr></table>Prove it.</td></tr>
<tr><td>How close can you get?
 
Using the digits 2, 3 and 4 in the calculation above how close can you get to 100? What is the largest product? What is the smallest product?</td></tr>
<tr><td>True or false?

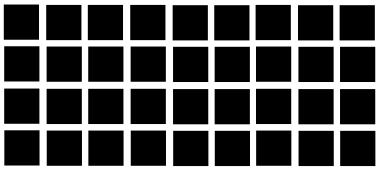
All the numbers in the two times table are even.

There are no numbers in the three times table that are also in the two times table.</td></tr>
<tr><td>Use the inverse
Use the inverse to check if the following calculations are correct
23 x 4 = 82
117 ÷ 9 = 14</td></tr>
<tr><td>Size of an answer
Will the answer to the following calculations be greater or less than 80
23 x 3=
32 x 3 =
42 x 3 =
36 x 2=</td></tr>
<tr><td>Vocabulary</td><td>groups of, lots of, times, array, altogether, multiply, total, count up in, multiplied by, column, row, repeated addition, commutative, sets of, equal groups, _ times as big as, once, twice, three times etc.

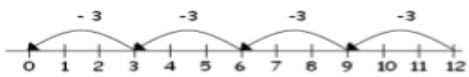
partition, grid method, multiple, product, tens, units, value</td></tr>
</table>

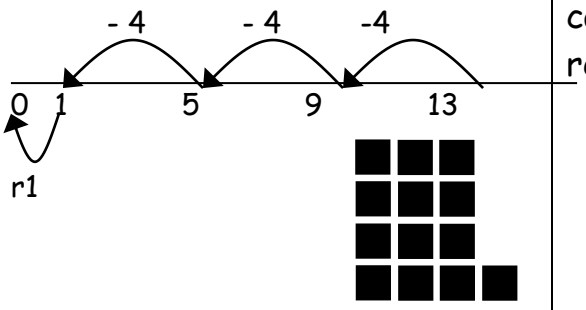
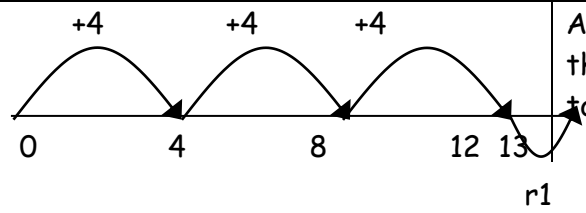
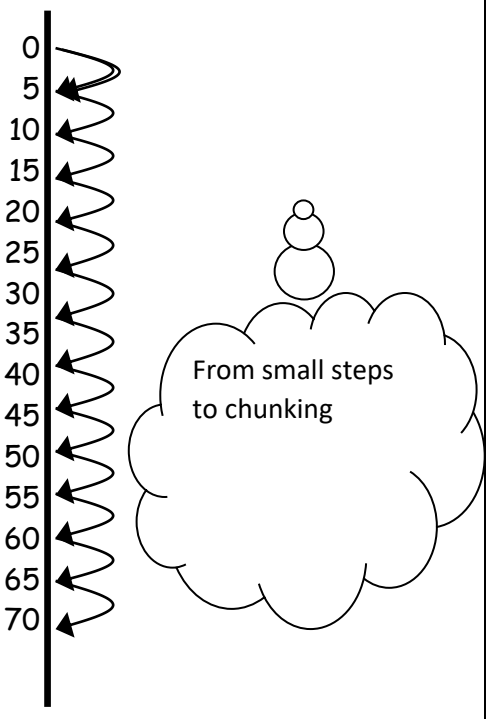
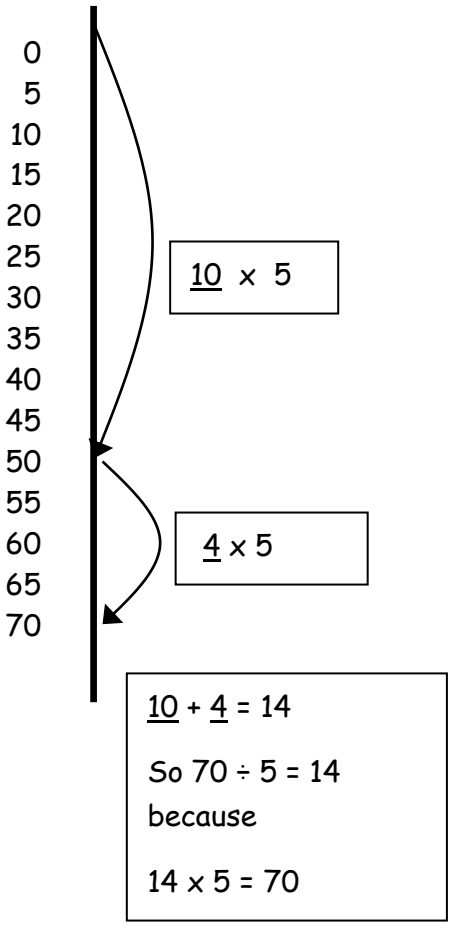
<table>
<tr><td rowspan="3">Resources / Models</td><td>4 times 6
6 + 6 + 6 + 6 = 24
4 lots of 6
6 x 4</td><td>Children may continue with repeated addition .</td></tr>
<tr><td> 

</td><td>Any empty number line can be used to help with repeated addition.

A bead string can also be used.</td></tr>
<tr><td> 

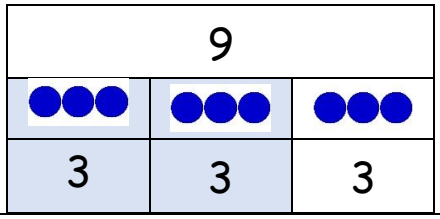
9 x 4 = 36</td><td>Arrays are still useful.</td></tr>
<tr><td rowspan="2"></td><td>38 x 5 = (30 x 5) + (8 x 5)
= 150 + 40
= 190</td><td>Children will multiply larger numbers using their times tables knowledge and partitioning the numbers.</td></tr>
<tr><td>x 30 8
5 150 40 = 190</td><td>This will lead onto the children using the grid method for multiplication.</td></tr>
<tr><td>Vocabulary - Division</td><td colspan="2">groups of, lots of, times, array, altogether, multiply, total, count up in, multiplied by, column, row, repeated addition, commutative, sets of, equal groups, _ times as big as, once, twice, three times etc.

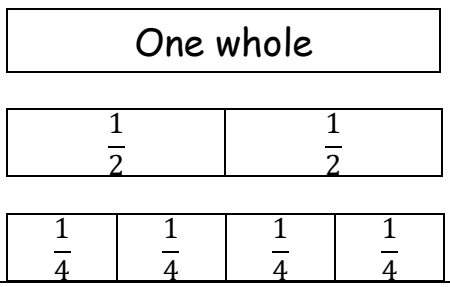
partition, grid method, multiple, product, tens, units, value</td></tr>
<tr><td>Models / resources</td><td>12 ÷ 3 = 4
 
</td><td>Division can be done by repeated subtraction along a numberline.</td></tr>
</table>

		How many times can I take 3 away from 12?
	13 ÷ 4 = 3 r 1 	Children will move onto calculations that have a remainder.
	 13 ÷ 4 = 3 r 1	As children become confident with their times tables they may prefer to count on.
		

COUNTING IN FRACTIONAL STEPS	
Objectives	*count up and down in tenths*
Reasoning	**Spot the mistake** six tenths, seven tenths, eight tenths, nine tenths, eleven tenths … and correct it.
	What comes next? 6/10, 7/10, 8/10, ….., …. 12/10, 11/10, ….., ….., …..
Vocabulary	numerator denominator tenths decimals equivalent
Resources / models	**<u>Counting in tenths</u>** $\frac{1}{10}$ $\frac{2}{10}$ $\frac{3}{10}$ $\frac{4}{10}$ $\frac{5}{10}$ $\frac{6}{10}$ $\frac{7}{10}$ $\frac{8}{10}$ $\frac{9}{10}$ $\frac{10}{10}$ Fraction wall Fraction strips

RECOGNISING FRACTIONS	
Objectives	recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators
	recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10.
	solve problems that involve all of the fraction objectives
Reasoning	**What do you notice?** 1/10 of 10 = 1 2/10 of 10 = 2 3/10 of 10 = 3 Continue the pattern. What do you notice? What about 1/10 of 20? Use this to work out 2/10 of 20, etc.
	True or false? 2/10 of 20cm = 2cm 4/10 of 40cm = 4cm 3/5 of 20cm = 12cm
Vocabulary	numerator denominator tenths

	decimals equivalent
Resources / models	**Fractions of objects** $\frac{2}{3}$ of 9 = $\frac{1}{3}$ of 9 = 3 $\frac{2}{3}$ of 9 = 6 

EQUiVALENCE DECIMALS AND PERCENTAGES	
Objectives	recognise and show, using diagrams, equivalent fractions with small denominators
Reasoning	**Odd one out**. Which is the odd one out in each of these trios $\frac{1}{2}$ 3/6 5/8 3/9 2/6 4/9 Why?
	What do you notice? Find 2/5 of 10 Find 4/10 of 10. What do you notice? Can you write any other similar statements?
	Ordering Put these fractions in the correct order, starting with the smallest. 4/8 $\frac{3}{4}$ 1/4
Resources / Models	**Equivalent fractions** (fold paper into strips to model the fractions) 

	$\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$
	Reasoning Is $\frac{2}{4}$ bigger then $\frac{1}{3}$? 1 whole $\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{4}{4}$ $\frac{1}{3}$ $\frac{2}{3}$ $\frac{3}{3}$

ADDITION AND SUBTRACTION OF FRACTIONS	
Objectives	add and subtract fractions with the same denominator within one whole (e.g. $^{5}/_{7} + {}^{1}/_{7} = {}^{6}/_{7}$)
Reasoning	**What do you notice?** 1/10 + 9/10 = 1 2/10 + 8/10 = 1 3/10 + 7/10 = 1 **Continue the pattern** Can you make up a similar pattern for eighths?
	The answer is 5/10, what is the question? (involving fractions / operations)
	Add and subtract fractions with the same denominator $\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$

EQUATIONS	
Objectives	solve problems, *including* ***missing number*** *problems, using number facts, place value, and more complex addition and subtraction.* (copied from Addition and Subtraction)
	solve problems, including ***missing number*** *problems, involving multiplication and division, including integer scaling*

	(copied from Multiplication and Division)
Reasoning	**Connected Calculations** Put the numbers 3, 12, 36 in the boxes to make the number sentences correct. □ = □ x □ □ = □ ÷ □

COMPARING AND ESTIMATING	
Reasoning	**Top Tips** Put these measurements in order starting with the largest. Half a litre Quarter of a litre 300 ml Explain your thinking
	Position the symbols Place the correct symbol between the measurements > or < 306cm □ Half a metre 930 ml □ 1 litre Explain your thinking
Vocabulary	Greater than Less than Order Sequence Compare Greater than Less than millimetre centimetre metre grammes / kilogrammes gram / kilogram millilitre litre

Vocabulary	Rulers (of differing lengths) Tape measure Containers Different litre containers Measuring cylinders Scales – analogue and digital
Objective	compare durations of events, for example to calculate the time taken by particular events or tasks
	estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight (appears also in Telling the Time)
Reasoning	**Undoing** A programme lasting 45 minutes finishes at 5.20. At what time did it start? Draw the clock at the start and finish time.
	Explain thinking Salha says that 100 minutes is the same as 1 hour. Is Salha right? Explain why.
Vocabulary	Start time End time Duration Difference am, pm morning afternoon evening midnight midday hours minutes seconds

MEASURING and CALCULATING	
Objective	measure, compare, add and subtract: **lengths** (m/cm/mm); **mass** (kg/g); **volume/capacity** (l/ml)
Reasoning	**Write more statements** (You may choose to consider this practically) If there are 630ml of water in a jug. How much water do you need to add to end up with a litre of water? What if there was 450 ml to start with? Make up some more questions like this

Objective	measure the **perimeter** of simple 2-D shapes
Reasoning	**Testing conditions** A square has sides of a whole number of centimetres. Which of the following measurements could represent its perimeter?8cm 18cm 24cm 25cm
Vocabulary	perimeter edge measure calculate
Resources / models	Squared paper Shapes Diagrams Geoboards
Objective	add and subtract amounts of **money** to give change, using both £ and p in practical contexts
Reasoning	**Possibilities** I bought a book which cost between £9 and £10 and I paid with a ten pound note. My change was between 50p and £1 and was all in silver coins. What price could I have paid?
Vocabulary	pounds pence change coins notes pay / paid amount total £ / p
Resources / models	Plastic coins Real coins Visual images of coins Purse Number lines

TELLING THE TIME

Objectives	tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks
	estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight (appears also in Comparing and Estimating)
Reasoning	**Working backwards** Tom's bus journey takes half an hour. He arrives at his destination at 9:25. At what time did his bus leave? 9:05 8:55 8:45
Vocabulary	O'clock, half past, quarter past, quarter to 5 past, 10 past, 20 past, 25 past 25 to, 20 to, 10 to, 5 to Earlier, later
Objective	know the number of seconds in a minute and the number of days in each month, year and leap year
Reasoning	**The answer is ….** 25 minutes What is the question?
	What do you notice? What do you notice? 1 minute = 60 seconds 2 minutes = 120 seconds Continue the pattern Write down some more time facts like these

IDENTIFYING SHAPES AND THIER PROPERTIES	
Reasoning	**What's the same, what's different?** What is the same and different about these three2-D shapes? 
	Visualising I am thinking of a 3-dimensional shape which has faces that are triangles and squares. What could my shape be?

DRAWING AND CONSTRUCTING	
Objective	draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them
Reasoning	**Other possibilities** Oneface of a 3-D shape looks like this.  What could it be? Are there any other possibilities?
Vocabulary	3D 2D Corners Edges Vertices Vertex Sides Faces

COMPARING AND CLASSIFYING	
Reasoning	**Always, sometimes, never** Is it always, sometimes or never that all sides of a hexagon are the same length.
	Other possibilities Can you find shapes that can go with the set with this label? "Have straight sides that are different lengths."

Angles	
Objectives	recognise angles as a property of shape or a description of a turn
	identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle
	identify horizontal and vertical lines and pairs of perpendicular and parallel lines
Reasoning	**Convince me** Which capital letters have perpendicular and / or parallel lines? Convince me.
Vocabulary	Angle…is a greater than/smaller than Acute angle Obtuse angle

POSITION, DIRECTION AND MOVEMENT	
Reasoning	**Working backwards** If I make the two opposite sides of a square 5 cm longer the new lengths of those sides are 27cm. What was the size of my original square? What is the name and size of my new shape?

INTERPRETING, CONSTRUCTING AND PRESENTING DATA	
Objectives	interpret and present data using bar charts, pictograms and tables
	solve one-step and two-step questions [e.g. 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.
Reasoning	**True or false?** (Looking at a bar chart) "Twice as many people like strawberry than lime". **Is this true or false?** **Convince me.** Make up your own 'true/false' statement about the bar chart.
	What's the same, what's different? Pupils identify similarities and differences between different representations and explain them to each other
	Create a questions Pupils ask (and answer) questions about different statistical representations using key vocabulary relevant to the objectives.
Vocabulary	chart, bar chart, frequency table Carroll diagram, Venn diagram axis, axes diagram