

Year 5 Maths

Counting	
Objectives	interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero count forwards or backwards in steps of powers of 10 for any given number up to 1000 000
Reasoning	Spot the mistake: 177000,187000,197000,217000 What is wrong with this sequence of numbers?
	True or False? When I count in 10's I will say the number 10100?
	What comes next? 646000-10000= 636000 636000 -10000 = 626000 626000- 10000 = 616000
Vocabulary	factor pair \geq greater than or equal to \leq less than or equal to formula divisibility square number prime number ascending/descending order composite place value tens, hundreds, thousands, ten thousands, hundred thousands, millions
Resources / models	For negative numbers have a vertical number line Use thermometers place value grids base 10 materials place value counters

Comparing numbers	
Objectives	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)
Reasoning	Do, then explain 747014 774014 747017 774077 744444 If you wrote these numbers in order starting with the smallest, which number would be third? Explain how you ordered the numbers.

Vocabulary	place value grids line the numbers up under each other.
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READING AND WRITING NUMBERS (including Roman Numerals)	
Objectives	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Comparing Numbers)
	read Roman numerals to 1000 (M) and recognise years written in Roman numerals.
Reasoning	True or false?
	What year comes next?
Resources / models	clock faces calendars book pages (Link back to Romans taught in Year 3)

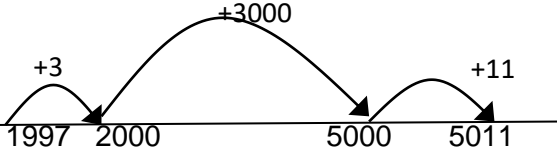
UNDERSTANDING PLACE VALUE	
Objectives	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)
	<i>recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents</i> (copied from Fractions)
Reasoning	Do, then explain Show the value of the digit 5 in these numbers? 350114 567432 985376 Explain how you know.
	Make up an example Give further examples Create six digit numbers where the digit sum is five and the thousands digit is two. Eg 3002000 2102000 What is the largest/smallest number?

ROUNDING	
Objectives	round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000

	round decimals with two decimal places to the nearest whole number and to one decimal place (copied from Fractions)
Reasoning	Possible answers A number rounded to the nearest thousand is 76000 What is the largest possible number it could be?
	What do you notice? Round 343997 to the nearest 1000. Round it to the nearest 10000. What do you notice? Can you suggest other numbers like this?
Vocabulary	Round to the nearest ten thousand
Resources / Models	number lines place value grids Outdoor learning - draw a large number line on the playground and move to the numbers and move round up or round down. Misconception - rounding down - some children round down too far.
Objective - Problem Solving	solve number problems and practical problems that involve all of the above

Addition and Subtraction	
Objectives - Mental Calculation	add and subtract numbers mentally with increasingly large numbers
Reasoning	True or false? Are these number sentences true or false? $6.17 + 0.4 = 6.57$ $8.12 - 0.9 = 8.3$ Give your reasons.
	Hard and easy questions Which questions are easy / hard? $213323 - 70 =$ $512893 + 300 =$ $819354 - 500 =$ $319954 + 100 =$ Explain why you think the hard questions are hard?
Vocabulary	ones boundary, tenths boundary, decimal place, place value, number bonds

Resources/ models	place value grids	
Objectives - WRITTEN METHODS	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	
Reasoning	<p>Convince me</p> <p> + 1475 = 6  24</p> <p>What numbers go in the boxes? What different answers are there? Convince me</p>	
Vocabulary - addition	<p>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, thousands, hundreds, digits, inverse</p> <p>decimal places, decimal point, tenths, hundredths, thousandths</p>	
Resources / models	<p>cubes, base 10 counters number lines number square place value grid</p>	
	$ \begin{array}{r} 2 \quad 3 \quad 4 \quad 8 \quad 1 \\ + \quad \quad 1 \quad 3 \quad 6 \quad 2 \\ \hline 2 \quad 4 \quad 8 \quad 4 \quad 3 \\ \hline \quad \quad \quad 1 \end{array} $	<p>When the children show a good understanding of number they will move on to the compact column method with carrying. The carried over number is written below the line. Also they can add a different number of digits together.</p>
	$ \begin{array}{r} \pounds \quad 2 \quad 3 \bullet 5 \quad 9 \\ + \quad \pounds \quad \quad 7 \bullet 5 \quad 5 \\ \hline \pounds \quad 3 \quad 1 \bullet 1 \quad 4 \\ \hline \quad \quad 1 \quad 1 \quad 1 \end{array} $	<p>Children can add different amounts of money together. Remind them to keep the decimal points lined up.</p>

	$ \begin{array}{r} 19\bullet 01 \\ 3\bullet 65 \\ + 7\bullet 50 \\ \hline 30\bullet 16 \\ \hline 21 \end{array} $	<p>Children will add more than two decimal numbers with different numbers of digits. A zero is added to help to keep all the digits in the right columns.</p>
<p>Vocabulary - Subtraction</p>	<p>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</p>	
	<p>$5011 - 1997 = 3014$</p> 	<p>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.</p>
	$ \begin{array}{r} 61016810 \\ \del{7169\bullet 0} \\ - 372\bullet 5 \\ \hline 6796\bullet 5 \end{array} $	<p>Children will use column subtraction (decomposition). Children will exchange (borrow). They will subtract numbers with differing numbers of digits.</p>
	$ \begin{array}{r} 21010416 \\ \del{31056} \\ - 2128 \\ \hline 28928 \end{array} $	

Objective	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
Reasoning	<p>Making an estimate Which of these number sentences have the answer that is between 0.5 and 0.6 11.74 - 11.18 33.3 - 32.71</p>
	<p>Always, sometimes, never Is it always, sometimes or never true that the sum of four even numbers is divisible by 4.</p>
Objective - Problem Solving	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

MULTIPLICATION & DIVISION FACTS	
Objectives - facts	<i>count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000</i> (copied from Number and Place Value)
Reasoning	<p>Missing numbers $6 \times 0.9 = \blacksquare \times 0.03$</p> <p>$6 \times 0.04 = 0.008 \times \blacksquare$ Which numbers could be written in the boxes?</p>
	<p>Making links Apples weigh about 170 g each. How many apples would you expect to get in a 2 kg bag?</p>
Vocabulary	place value grids counters
MULTIPLICATION & DIVISION Mental calculations	
Objectives	multiply and divide numbers mentally drawing upon known facts
	multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
Reasoning	<p>Use a fact $3 \times 75 = 225$ Use this fact to work out $450 \div 6 =$ $225 \div 0.6 =$</p>

	<p>To multiply by 25 you multiply by 100 and then divide by 4. Use this strategy to solve</p> <p>48×25 78×25</p> <p>4.6×25</p> <p>Making links</p> <p>$7 \times 8 = 56$</p> <p>How can you use this fact to solve these calculations?</p> <p>$0.7 \times 0.8 =$</p> <p>$5.6 \div 8 =$</p>
Vocabulary	divisible

MULTIPLICATION & DIVISION Written Calculations		
Objectives	multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers	
Reasoning	<p>Prove It</p> <p>What goes in the missing box?</p> <p>$12 \square 2 \div 6 = 212$</p> <p>$14 \square 4 \div 7 = 212$</p> <p>$22 \square 3 \div 7 = 321 \text{ r } 6$</p> <p>$323 \times \square 1 = 13243$</p> <p>Prove it.</p>	
Vocabulary	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 square, factor, integer, decimal, short / long multiplication, 'carry'	
Resources / Models	$\begin{array}{r} \times \quad 3000 \quad 400 \quad 60 \quad 4 \\ 9 \quad \boxed{27000} \quad \boxed{3600} \quad \boxed{540} \quad \boxed{36} \\ \hline = 31176 \end{array}$	The grid method develops children's understanding of the values of the numbers involved.
	$\begin{array}{r} 3000 \quad 400 \quad 60 \quad 4 \end{array}$	The grid can be extended for the number of digits required.

	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>9</td><td>27000</td><td>3600</td><td>540</td><td>36</td><td>=</td><td>31176</td></tr> <tr> <td>3</td><td>9000</td><td>1200</td><td>180</td><td>12</td><td>=</td><td>10392</td></tr> </table> $\begin{array}{r} 41568 \\ \hline 1 \end{array}$	9	27000	3600	540	36	=	31176	3	9000	1200	180	12	=	10392	<p>Again showing the value of each digit in the number. This method can also be used with decimal numbers.</p>
9	27000	3600	540	36	=	31176										
3	9000	1200	180	12	=	10392										
	$\begin{array}{r} 23 \\ \times 8 \\ \hline 24 \\ + 160 \\ \hline 184 \end{array}$	<p>The grid method moves onto a long multiplication layout.</p>														
	$\begin{array}{r} 23 \\ \times 8 \\ \hline 184 \\ \hline 2 \end{array}$ <p>Children need reminding here that they are working out 20 x 8, not 2 x 8.</p>	<p>Which quickly moves onto the short multiplication method as the children understand what is happening with the numbers.</p>														
	$\begin{array}{r} 72 \\ \times 38 \\ \hline 16 \\ 560 \\ 60 \\ \hline 2100 \\ \hline 2736 \\ \hline 1 \end{array}$	<p>For calculations with TU x TU or HTU x TU children should use the long multiplication method.</p>														
<p>Objective</p>	<p>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</p>															
<p>Vocabulary - Division</p>	<p>share, share equally, one each, two each..., group, 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, chunking quotient, prime number, prime factors, composite number (non-prime)</p>															
<p>Models / resources</p>	$\begin{array}{r} 218 \\ 4 \overline{) 872} \\ \underline{- 800} \quad (200 \times 4) \\ 070 \\ \underline{- 40} \quad (10 \times 4) \\ 32 \\ \underline{- 32} \quad (8 \times 4) \\ 0 \end{array}$	<p>Chunking Top tip: Children to subtract chunks they are most comfortable with Work out 2x 5x 10x</p>														
	<p>4356 ÷ 5</p> $\begin{array}{r} 0871r1 \\ 5 \overline{) 4356} \end{array}$ <p>Answers can be as a remainder 871r1 Answer can be as a fraction 871 ¹/₅</p>	<p>This will lead to short division but only when the children have a good understanding of the numbers. E.g. how many 3's are in 70. A link to multiplication would be beneficial here.</p>														

	<p>Answer can be as a decimal 871.2 by continuing the short division calculation after the decimal point.</p> $\begin{array}{r} 0 \ 8 \ 7 \ 1 \ . \ 2 \\ 5 \overline{) 4 \ 4 \ 3 \ 5 \ 6 \ . \ 0} \end{array}$ <p>Answer can be rounded 871</p>	<p>Children will learn what to do with the remainder in a calculation so they can make the right choice of answer when solving problems.</p>
PROPERTIES OF NUMBERS: MULTIPLES, FACTORS, PRIMES, SQUARE AND CUBE NUMBERS		
Objectives	identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.	
	know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers	
	establish whether a number up to 100 is prime and recall prime numbers up to 19	
	recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)	
Reasoning	<p>Always, sometimes, never?</p> <p>Is it always, sometimes or never true that multiplying a number always makes it bigger</p> <p>Is it always, sometimes or never true that prime numbers are odd.</p> <p>Is it always, sometimes or never true that when you multiply a whole number by 9, the sum of its digits is also a multiple of 9</p> <p>Is it always, sometimes or never true that a square number has an even number of factors.</p>	
Vocabulary	arrays, cubes, number squares	
INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS		
Reasoning	<p>Use the inverse</p> <p>Use the inverse to check if the following calculations are correct:</p> <p>4321 × 12 = 51852</p> <p>507 ÷ 9 = 4563</p>	
	<p>Size of an answer</p> <p>The product of a two digit and three digit number is approximately 6500. What could the numbers be?</p>	
PROBLEM SOLVING		
Objective	solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes	
	solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	

	solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates
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COUNTING IN FRACTIONAL STEPS	
Reasoning	Spot the mistake 0.088, 0.089, 1.0
	What comes next? 1.173, 1.183, 1.193
Vocabulary	Proper/improper fraction Equivalent Reduced to, cancel Thousandths In every, for every Percentage Per cent %

RECOGNISING FRACTIONS	
Objectives	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (appears also in Equivalence)
Reasoning	What do you notice? One tenth of £41 One hundredth of £41 One thousandth of £41 Continue the pattern What do you notice? $0.085 + 0.015 = 0.1$ $0.075 + 0.025 = 0.1$ $0.065 + 0.035 = 0.1$ Continue the pattern for the next five number sentences.
	True or false? 0.1 of a kilometre is 1m. 0.2 of 2 kilometres is 2m. 0.3 of 3 Kilometres is 3m 0.25 of 3m is 500cm. $2/5$ of £2 is 20p

Comparing FRACTIONS	
Objectives	compare and order fractions whose denominators are all multiples of the same number
Reasoning	<p>Give an example of a fraction that is more than three quarters. Now another example that no one else will think of. Explain how you know the fraction is more than three quarters.</p> <p>Imran put these fractions in order starting with the smallest. Are they in the correct order? Two fifths, three tenths, four twentieths How do you know?</p>
Vocabulary	equivalent
Resources / models	bar model fraction strips

Comparing DECIMALS	
Objectives	read, write, order and compare numbers with up to three decimal places
Reasoning	<p>Missing symbol Put the correct symbol < or > in each box</p> <p>4.627 <input type="checkbox"/> 4.06</p> <p>12.317 <input type="checkbox"/> 12.31</p> <p>What needs to be added to 3.63 to give 3.13? What needs to be added to 4.652 to give 4.1?</p>

Rounding including DECIMALS	
Objectives	round decimals with two decimal places to the nearest whole number and to one decimal place
Reasoning	<p>Do, then explain Circle each decimal which when rounded to one decimal place is 6.2. 6.32 6.23 6.27 6.17 Explain your reasoning</p> <p>Top tips Explain how to round decimal numbers to one decimal place? <i>Also see rounding in place value</i></p>

EQUIVALENCE (INCLUDING FRACTIONS, DECIMALS AND PERCENTAGES)	
Objectives	<p>identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths</p> <p>read and write decimal numbers as fractions (e.g. $0.71 = \frac{71}{100}$)</p>

	<p>recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents</p> <p>recognise the per cent symbol (%) and understand that per cent relates to "number of parts per hundred", and write percentages as a fraction with denominator 100 as a decimal fraction</p>								
Reasoning	<p>Odd one out. Which is the odd one out in each of these collections of 4 fractions 6/10 3/5 18/20 9/15 30/100 3/10 6/20 3/9 Why?</p> <p>What do you notice? Find 30/100 of 200 Find 3/10 of 200 What do you notice? Can you write any other similar statements?</p> <p>Complete the pattern</p> <table border="1" data-bbox="411 853 740 1055"> <tr> <td>$\frac{71}{100}$</td> <td>$\frac{??}{100}$</td> <td>$\frac{??}{100}$</td> <td>$\frac{??}{100}$</td> </tr> <tr> <td>0.71</td> <td>0.81</td> <td>???</td> <td>???</td> </tr> </table> <p>Complete the table.</p> <p>Another and another Write a fraction with a denominator of one hundred which has a value of more than 0.75? ... and another, ... and another, ...</p> <p>Ordering Put these numbers in the correct order, starting with the largest. 7/10, 0.73, 7/100, 0.073 71% Explain your thinking</p> <p>Which is more: 20% of 200 or 25% of 180? Explain your reasoning.</p>	$\frac{71}{100}$	$\frac{??}{100}$	$\frac{??}{100}$	$\frac{??}{100}$	0.71	0.81	???	???
$\frac{71}{100}$	$\frac{??}{100}$	$\frac{??}{100}$	$\frac{??}{100}$						
0.71	0.81	???	???						
Vocabulary	<p>In every, for every Percentage Per cent %</p>								

ADDITION AND SUBTRACTION OF FRACTIONS	
Objectives	add and subtract fractions with the same denominator and multiples of the same number
	recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$)
Reasoning	<p>What do you notice?</p> <p>$\frac{3}{4}$ and $\frac{1}{4} = 4/4 = 1$ $4/4$ and $\frac{1}{4} = 5/4 = 1\frac{1}{4}$ $5/4$ and $\frac{1}{4} = 6/4 = 1\frac{2}{4}$</p> <p>Continue the pattern up to the total of 2.</p> <p>Can you make up a similar pattern for subtraction?</p> <p>The answer is $1\frac{2}{5}$, what is the question</p>
Resources / Models	<p>Mixed numbers</p> $\frac{6}{4} = 1\frac{2}{4}$


MULTIPLICATION AND DIVISION OF Fractions	
Objectives	multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
Reasoning	<p>Continue the pattern</p> <p>$\frac{1}{4} \times 3 =$ $\frac{1}{4} \times 4 =$ $\frac{1}{4} \times 5 =$</p> <p>Continue the pattern for five more number sentences. How many steps will it take to get to 3?</p> <p>$5/3$ of 24 = 40</p> <p>Write a similar sentence where the answer is 56.</p> <p>The answer is $2\frac{1}{4}$, what is the question</p> <p>Give your top tips for multiplying fractions.</p>


MULTIPLICATION AND DIVISION OF Decimals	
Reasoning	<p>Undoing I divide a number by 100 and the answer is 0.33 What number did I start with?</p> <p>Another and another Write down a number with two decimal places which when multiplied by 100 gives an answer between 33 and 38. ... and another, ... and another, ...</p>

Problem Solving – Fractions, decimals, percentages	
Reasoning	<p>solve problems involving numbers up to three decimal places</p> <p>solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those with a denominator of a multiple of 10 or 25.</p>

EQUATIONS	
Objective	<p><i>use the properties of rectangles to deduce related facts and find missing lengths and angles</i> (copied from <i>Geometry: Properties of Shapes</i>)</p>
Reasoning	<p>Connected Calculations The number sentence below represents the angles in degrees of an isosceles triangle. $A + B + C = 180$ degrees A and B are equal and are multiples of 5. Give an example of what the 3 angles could be. Write down 3 more examples</p>
Vocabulary	formula
FORMULAE	
Reasoning	<p>Undoing The perimeter of a rectangular garden is between 40 and 50 metres. What could the dimensions of the garden be?</p>

COMPARING AND ESTIMATING


Objective	calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm ²) and square metres (m ²) and estimate the area of irregular shapes (also included in measuring)
	estimate volume (e.g. using 1 cm ³ blocks to build cubes and cuboids) and capacity (e.g. using water)
Reasoning	<p>Top Tips Put these amounts in order starting with the largest. 130000cm² 1.2 m² 13 m² Explain your thinking</p>
	<p>Undoing A school play ends at 6.45pm. The play lasted 2 hours and 35 minutes. What time did it start?</p>
	<p>Other possibilities (links with geometry, shape and space) A cuboid is made up of 36 smaller cubes.  If the cuboid has the length of two of its sides the same what could the dimensions be? Convince me</p>


MEASURING and CALCULATING	
Objective	use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling.
Reasoning	<p>Write more statements Mr Smith needs to fill buckets of water. A large bucket holds 6 litres and a small bucket holds 4 litres. If a jug holds 250 ml and a bottle holds 500 ml suggest some ways of using the jug and bottle to fill the buckets.</p>
Objective	measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres
Reasoning	<p>Testing conditions Shape A is a rectangle that is 4m long and 3m wide. Shape B is a square with sides 3m. The rectangles and squares are put together side by side to make a path which has perimeter between 20 and 30 m. For example </p>

	Can you draw some other arrangements where the perimeter is between 20 and 30 metres?
Objective	calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes
	<i>recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)</i> (copied from Multiplication and Division)
Reasoning	Always, sometimes, never When you cut off a piece of a shape you reduce its area and perimeter. <i>See also Geometry Properties of Shape</i>

TELLING THE TIME	
Objectives	solve problems involving converting between units of time
Reasoning	Working backwards Put these lengths of time in order starting with the longest time. 105 minutes 1 hour 51 minutes 6360 seconds

CONVERTING	
Objectives	convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)
	solve problems involving converting between units of time
	understand and use equivalences between metric units and common imperial units such as inches, pounds and pints
Reasoning	The answer is 0.3km What is the question? What do you notice? What do you notice? 1 minute = 60 seconds 60 minutes = <input type="text"/> seconds Fill in the missing number of seconds down some more time facts like this.

IDENTIFYING SHAPES AND THIER PROPERTIES	
Objective	identify 3-D shapes, including cubes and other cuboids, from 2-D representations
Reasoning	<p>What's the same, what's different? What is the same and what is different about the net of a cube and the net of a cuboid?</p>
	<p>Visualising I look at a large cube which is made up of smaller cubes.</p>  <p>If the larger cube is made up of between 50 and 200 smaller cubes what might it look like?</p>
Vocabulary	Radius Diameter Congruent Axis of symmetry Reflective symmetry x-axis y-axis quadrant octahedron

DRAWING AND CONSTRUCTING	
Objective	draw given angles, and measure them in degrees ($^{\circ}$)
Reasoning	<p>Other possibilities Here is one angle of an isosceles triangle. You will need to measure the angle accurately. What could the other angles of the triangle be? Are there any other possibilities?</p> 

COMPARING AND CLASSIFYING	
Objectives	use the properties of rectangles to deduce related facts and find missing lengths and angles
	distinguish between regular and irregular polygons based on reasoning about equal sides and angles
Reasoning	<p>Always, sometimes, never</p> <p>Is it always, sometimes or never true that the number of lines of reflective symmetry in a regular polygon is equal to the number of its sides n.</p>
	<p>Other possibilities</p> <p>A rectangular field has a perimeter between 14 and 20 metres . What could its dimensions be?</p>

Angles	
Objectives	know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
	<p>identify:</p> <ul style="list-style-type: none"> * angles at a point and one whole turn (total 360°) * angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°) * other multiples of 90°
Reasoning	<p>Convince me</p> <p>What is the angle between the hands of a clock at four o'clock? At what other times is the angle between the hands the same? Convince me</p>
Vocabulary	acute, obtuse, right angle, estimate, order, measure

POSITION, DIRECTION AND MOVEMENT	
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

Reasoning	<p>Working backwards A square is translated 3 squares down and one square to the right. Three of the coordinates of the translated square are: (3, 6) (8, 11) (8, 6) What are the co-ordinates of the original square?</p>
Vocabulary	<p>Coordinate x axis y axis Protractor</p>

INTERPRETING, CONSTRUCTING AND PRESENTING DATA	
Objectives	complete, read and interpret information in tables, including timetables
Reasoning	<p>True or false? (Looking at a train time table) "If I want to get to Exeter by 4 o'clock this afternoon, I will need to get to Taunton station before midday". Is this true or false? Convince me. Make up your own 'true/false' statement about a journey using the timetable.</p> <p>What's the same, what's different? Pupils identify similarities and differences between different representations and explain them to each other</p>
Vocabulary	<p>Database bar line chart line graph maximum/minimum value outcome</p>

SOLVING PROBLEMS	
Objectives	solve comparison, sum and difference problems using information presented in a line graph
Reasoning	<p>Create questions Pupils ask (and answer) questions about different statistical representations using key vocabulary relevant to the objectives. (see above)</p>