

Skills and Knowledge Progression

Maths Year 6



Year 6

<p>Place Value</p>	<ol style="list-style-type: none"> 1. Read, write, order and compare numbers up to 100 000 000 and determine the value of each digit 2. Round any whole number to a required degree of accuracy in context 3. Use negative numbers in context <p>Solve number and practical problems that involve all of the above</p>	<p>Demonstrate all elements of Y6 Expected in a range of contexts and types of problems solving (measurement, time, word problems, logic puzzles, finding all possibilities, true/false, finding and describing patterns and sequences)</p> <ol style="list-style-type: none"> 1. Spot the mistake: -80, -60, 10, 50; what is wrong with this sequence? 2. True or False: The temperature is -3: it gets 2 degrees warmer. The new temperature is -5. 3. Do, then explain: Find out the populations in five countries. Order the populations in various orders. Explain why you did so. 4. Do, then explain: Show the value of the digit 6 in these numbers: 6787555, 95467754. Explain how you know. 5. Make up an example: Create 7 digit numbers where the digit sum is 6 and the tens of thousands digit is 2, e.g. 4020000. What is the largest and smallest number? 6. Possible answers: Two numbers each with two decimal places round to 23.1 to one decimal place. The total of the numbers is 46.2. What could the numbers be? 7. What do you notice? Give an example of a 6-digit number which rounds to the same number when rounded to the nearest 10000 and 100000. 8. Be able to demonstrate all of the above using manipulatives and a range of representation as well as written recordings. 9. Be able to explain any Y6 Place Value concept to another pupil so it is understood clearly.
<p>Addition, Subtraction,</p>	<ol style="list-style-type: none"> 1. Multiply up to 5-d number by a 2-d whole number using long multiplication 	<p>Demonstrate all elements of Y6 Expected in a range of contexts and types of problems solving (measurement, time, word problems, logic</p>

<p>Multiplication and Division</p>	<ol style="list-style-type: none"> 2. Divide numbers up to 5-d by a 2-d whole number using short division 3. Divide numbers up to 5-d by a 2-d whole number using long division 4. Interpret remainders as whole number remainders 5. Interpret remainders as fractions 6. Interpret remainders as decimals 7. Interpret remainders by rounding, as appropriate for the context 8. Perform mental calculations, including mixed operations and large number 9. Identify common factors 10. Identify common multiples 11. Identify prime numbers and know them by note 12. Use their knowledge of the order of operations to carry out calculations involving the four ops 13. Solve + and - multi-step problems in contexts, deciding which operations and method to use and why 14. Solve multistep problems involving +, -, x, ÷ 15. Use estimation to check answers to calculations 	<p>puzzles, finding all possibilities, true/false, finding and describing patterns and sequences)</p> <ol style="list-style-type: none"> 1. True or False? Are these calculations true or false? $6.32 + 8 = 1.68$. Give your reasons. 2. Hard and easy questions: Which questions are easy/hard? $213323 - 70 = \square$; $512893 + 37 = \square$; $8193.54 - 5.9 = \square$; explain why you think the questions are hard. 3. Missing symbols: Write the missing signs (+, -, x, ÷) in this calculation: $6 \square 12.3 = 61.9 \square 11.9$. 4. What else do you know? If you know this: $86.7 + 13.3 = 100$, what other facts do you know? 5. Convince me: Three 4-digit numbers total 12435. What could they be? Convince me. 6. Making and estimate: Circle the number that is the best estimate to $932.6 - 931.05$: 1.3, 1.5, 1.7, 1.9. 7. Always, sometimes, never: The sum of two consecutive triangular numbers is a square number. 8. Be able to demonstrate all of the above using manipulatives and a range of representation as well as written recordings. 9. Be able to explain any Y6 Addition and Subtraction concept to another pupil so it is understood clearly.
<p>Fractions</p>	<ol style="list-style-type: none"> 1. Use common factors to simplify fractions 2. Use common multiples to express fractions in the same denomination 3. Compare and order fractions including > 1 4. Add and subtract fractions with different denominators 5. Add and subtract fractions with mixed numbers 6. Multiply simple pairs of proper fractions, writing the answer in simplest form 7. Divide proper fractions by whole numbers 8. Associate a fraction with division to calculate decimal fraction equivalents 9. Identify the value of each digit to 3 decimal places 10. Multiply and divide numbers by 10 up to 3dp 11. Multiply and divide numbers by 100 up to 3dp 12. Multiply and divide numbers by 1000 up to 3dp 	<p>Demonstrate all elements of Y6 Expected in a range of contexts and types of problems solving (measurement, time, word problems, logic puzzles, finding all possibilities, true/false, finding and describing patterns and sequences)</p> <ol style="list-style-type: none"> 1. Missing numbers: $2.4 \div 0.3 = \square 1.25$. Which number could be written in the box? 2. Making links: $0.7 \times 8 = 5.6$. How can you use this fact to solve these calculations? $0.7 \times 0.08 = \square$, $0.56 \div 8 = \square$. 3. Use a fact: $12 \times 1.1 = 13.2$. Use this fact to work out $15.4 \div 1.1 =$ and $27.5 \div 1.1 =$. 4. Prove it: What goes in the missing box? $18 \square 4 \div 12 = 157$; $38 \square 5 \div 18 = 212.5$; $33 \square 2 \div 8 = 421.5$; $38 \times \square 7 = 178.6$. Prove it. 5. Can you find? Can you find the smallest number that can be added to or subtracted from 87.6 to make it exactly divisible?

	<ol style="list-style-type: none"> 13. Multiply one-digit numbers with up to two decimal places by whole numbers 14. Use written division methods in cases where the answer has up to two decimal places 15. Solve problems which require answers to be rounded to specifies degrees of accuracy 16. Recall and use equivalences between simple fractions, decimals and percentages 	<ol style="list-style-type: none"> 6. Always, sometimes, never: Dividing a whole number by half makes the answer twice as big. When you square an even number, the result is divisible by 4. Multiples of 7 are 1 more or 1 less than prime numbers. 7. Which is correct? Which of these calculations is correct? $3 + 6 \times 2 = 15$; $6 \times 5 - 7 \times 4 = 92$; $8 \times 20 \div 4 \times 3 = 37$. 8. Be able to demonstrate all of the above using manipulatives and a range of representation as well as written recordings. 9. Be able to explain any Y6 Multiplication and Division concept to another pupil so it is understood clearly.
<p>Measurement</p>	<ol style="list-style-type: none"> 1. Solve problems involving the calculation and conversion of units to measure 2. Use, read, write and convert between standard units using decimal notation to 3 decimal places 3. Convert between miles and kilometres 4. Recognise that shapes with the same areas can have different perimeters and vice versa 5. Recognise when it is possible to use the formulae for area. 6. Recognise when it is possible to use the formulae for volume of shapes 7. Calculate the area of triangles 8. Calculate area of parallelograms 9. Solve problems that involve the area of triangles 10. Calculate, estimate and compare volume of cubes and cuboids using standard units, including (cm³) and (m³) and extending to mm³ and km³ 	<p>Demonstrate all elements of Y6 Expected in a range of contexts and types of problems solving (measurement, time, word problems, logic puzzles, finding all possibilities, true/false, finding and describing patterns and sequences)</p> <ol style="list-style-type: none"> 1. Top tips: Put these amounts in order starting with the largest: 100 cm³, 1000000mm³, 1m³. Explain your thinking. 2. Undoing: A film lasting 200 minutes finished at 17:45. At what time did it start? 3. Other possibilities: (links with geometry, shape and shape) A cuboid has volume between 200 and 250cm³. Each edge is at least 4cm long. List four possibilities for the dimensions of the cuboid. 4. Write more statements: Chen, Megan and Sam have parcels. Megan's parcel weighs 1.2kg and Chen's weighs is 1500g. Sam's parcel is half the weight of Megan's parcel. Write down some other statements about the parcels. How much heavier is Megan's parcel than Chen's parcel? 5. Testing conditions: A square has a perimeter of 12cm. When four squares are put together, the perimeter of the new shape can be calculated. For example, what arrangements will give the maximum perimeter? 6. Always, sometimes, never: The area of a triangle is half the area of the rectangle that encloses it. 7. The answer is: 24 m³. What is the question?

		8. What do you notice? 8km = 5 miles. 16km = □miles. 4km = □miles. Write down some more facts connecting miles and km. 9. Be able to demonstrate all of the above using manipulatives and a range of representation as well as written recordings. 10. Be able to explain any Y6 Measurement concept to another pupil so it is understood clearly.
Geometry	1. Draw 2d shapes given dimensions and angles 2. Recognise, describe and build simple 3d shape including nets 3. Compare and classify geometric shapes based on their properties and size 4. Find unknown angles in any triangle 5. Find unknown angles in any quadrilateral by knowing its angle sum 6. Know that angles in any regular polygons by knowing its angle sum 7. Find unknown angles in regular polygons by knowing its angle sum 8. Know that angles on a straight line add up to 180° 9. Recognise angles that are vertically opposite and find missing angles 10. Recognise corresponding angles and use that to find missing angles 11. Illustrate and name parts of circles (radius, diameter, circumference) 12. Describe positions on the full co-ordinate grid (all four quadrants) Draw and translate simple shapes on the co-ordinate plane, and reflect them in the axes	Demonstrate all elements of Y6 Expected in a range of contexts and types of problems solving (measurement, time, word problems, logic puzzles, finding all possibilities, true/false, finding and describing patterns and sequences) 1. What is the same, what is different? What is the same and what is different about the nets of a triangular prism and a square-based-pyramid? 2. Visualising: Jess has 24 cubes that she builds to make a cuboid. Write the dimensions of cuboids that she could make. 3. Possibilities: If one angle of an isosceles triangle is 36 degrees, what could the triangle look like? Draw as many possibilities as you can. 4. Create: Draw a net of a cuboid so it has a volume of 24cm ³ . 5. Always, sometimes, never: In a polyhedron, the number of vertices plus the number of faces equals the number of edges. 6. Convince me: One angle at the point where the diagonals of a rectangle meet is 36 degrees. What could be the other angles be? 7. Working backwards: Two triangles have the following coordinates: Triangle A: (3, 5) (7, 5) (4, 7), Triangle B: (3, 1) (7, 1) (4, 3). Describe the translation of Triangle A to B and then B to A. 8. Be able to demonstrate all of the above using manipulatives and a range of representation as well as written recordings. 9. Be able to explain any Y6 Shape/Geometry concept to another pupil so it is understood clearly.
Statistics	1. Interpret pie charts and use these to solve problems 2. Construct pie charts and use these to solve problems 3. Interpret line graphs and use these to solve problems 4. Construct line graphs and use these to solve problems	Demonstrate all elements of Y6 Expected in a range of contexts and types of problems solving (measurement, time, word problems, logic puzzles, finding all possibilities, true/false, finding and describing patterns and sequences)

		<ol style="list-style-type: none"> 1. True or False: (Looking at Pie Chart) “More than twice the number of people any their favourite TV programme is soaps than any other.” Is this true or false? Convince me. Make up your own true/false statements about this Pie Chart. 2. What is the same, what is different? Pupils identify similarities and differences between different representations and explain them to each other. 3. Create a question: Make up a set of five numbers with a mean of 2.7. 4. Missing information: The mean score in six test papers in a spelling test of 20 questions is 15. Five of the scores were 12, 12, 17, 18 and 16. What is the missing score? 5. Be able to demonstrate all of the above using manipulatives and a range of representation as well as written recordings. 6. Be able to explain any Y6 Statistics concept to another pupil so it is understood clearly.
<p>Ratio and proportion</p>	<ol style="list-style-type: none"> 1. Solve problems involving the relative sizes of 2 quantities where missing values can be found by using integer multiplication and division facts 2. Solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison 3. Solve problems involving similar shapes where the scale factor is known or can be found 4. Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples 	<p>Demonstrate all elements of Y6 Expected in a range of contexts and types of problems solving (measurement, time, word problems, logic puzzles, finding all possibilities, true/false, finding and describing patterns and sequences)</p> <ol style="list-style-type: none"> 1. True or False $1:4 = \frac{1}{4}$ 2. Convince me: In a class of children 25% are boys and the rest are girls. There are 18 girls. How many children are in the class? 3. Problem solving: To make a sponge cake, I need six times as much flour as I do when I’m making a fairy cake. If a sponge cake needs 270 g of flour, how much does a fairy cake need? 4. Missing Information: Sam has 9 fewer sweets than Sarah. They have 35 sweets altogether. How many sweets does Sam have?
<p>Algebra</p>	<ol style="list-style-type: none"> 1. Use simple formulae 2. Generate and describe linear number sequences 3. Express missing number problems algebraically 4. Find pairs of numbers that satisfy an equation with 2 unknowns 5. Enumerate possibilities of combinations of 2 variables 	<p>Demonstrate all elements of Y6 Expected in a range of contexts and types of problems solving (measurement, time, word problems, logic puzzles, finding all possibilities, true/false, finding and describing patterns and sequences)</p> <ol style="list-style-type: none"> 1. True or False: are these number sentences true or false $x + 5 = 2 \times 3 - 1 + x$

		<p>2. Always , sometimes, never: it is always true that you need to do the inverse to find the value in algebra</p> <p>3. what else do you know: if $x = 5$ what does p equal in the equation $2x + p = 23$</p>
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