

Skills and Knowledge Progression

Maths Year 5



	Year 5	Above Expected (Mastery)
Place Value	<ol style="list-style-type: none"> 1. Read, write, order and compare numbers up to 1,000,000 and determine the value of each digit. 2. Count forwards or backwards in 10 for any given number up to 1,000,000 3. Count forward and backwards with positive and negative whole numbers through zero. 4. Interpret negative numbers in context. 5. Round any number up to 1million to the nearest 10, 100 and 1000 6. Round any number up to 1million to the nearest 10000 and 100,000 7. Solve number problems and practical problems. 8. Read roman numerals up to 1000 and recognise years. 	<p>Demonstrate all elements of ‘Y5 expected’ in a range of contexts and types of problem solving (measurement; time; word problems; logic puzzles; finding all possibilities; true/false; finding and describing patterns and sequences).</p> <p>1. Spot the mistake: 177000, 187000, 197000, 217000 What is wrong with this sequence of numbers? True or false? When I count in 10s I will say the number 10100? What comes next? $646000 - 10000 = 636000$ $636000 - 10000 = 626000$ $626000 - 10000 = 616000$</p> <p>2. Do, then explain: Show the value of the digit 5 in these numbers? 350114 567432 985376 Explain how you know.</p> <p>3. 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?</p> <p>4. Possible answers: A number rounded to the nearest thousand is 76000. What is the largest possible number it could be?</p> <p>5. 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?</p> <p>6. Be able to demonstrate all of the above using manipulatives and a range of representations as well as written recordings.</p> <p>7. Be able to explain any Year 5 Place Value Concept to another pupil so that they understand it clearly.</p>
Addition and Subtraction	<ol style="list-style-type: none"> 1. Add and subtract whole numbers with more than 4digits using formal written method 	<p>Demonstrate all elements of ‘Y5 expected’ in a range of contexts and types of problem solving (measurement; time; word problems; logic puzzles; finding all</p>

	<ol style="list-style-type: none"> 2. Add and subtract numbers up to 3 digit by 3 digit mentally 3. Use rounding to check answers to calculations and determine in the context of a problem, levels of accuracy 4. Solve addition and subtraction multi-step problems in context. 	<p>possibilities; true/false; finding and describing patterns and sequences).</p> <p>1. 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.</p> <p>2. Hard and easy questions: Which questions are easy/hard? $213323 - 70 = \square$; $819354 - 500 = \square$; $319954 + 100 = \square$. Explain why you think the hard questions are hard?</p> <p>3. Convince me: $\square + 1475 = 6\square24$ What numbers go in the boxes? What different answers are there? Convince me.</p> <p>4. 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>5. Always, sometimes, never: Is it always, sometimes or never true that the sum of four even numbers is divisible by 4.</p> <p>6. Be able to demonstrate all of the above using manipulatives and a range of representations as well as written recordings.</p> <p>7. Be able to explain any Year 5 Addition and Subtraction Concept to another pupil so that they understand it clearly.</p>
<p>Multiplication and Division</p>	<ol style="list-style-type: none"> 1. Identify multiple of numbers 2. Identify factors of numbers by finding all the factor pairs of a number 3. Identify common factors of two numbers 4. Know and use the vocabulary of prime numbers 5. Know and use the vocabulary of prime factors 6. Know and use the vocabulary of composite (non-prime numbers) 7. Establish whether a number up to 100 is a prime number 8. Recall prime numbers up to 19 9. Multiple numbers up to 4 digits by a 1 digit number using a formal written method 	<p>Demonstrate all elements of 'Y5 expected' in a range of contexts and types of problem solving (measurement; time; word problems; logic puzzles; finding all possibilities; true/false; finding and describing patterns and sequences).</p> <p>1. Missing numbers: $6 \times 0.9 = \square \times 0.03$ or $6 \times 0.14 = 0.008 \times \square$. Which numbers could be written in the boxes?</p> <p>2. Making links: Apples weigh about 170g each. How many apples would you expect to get in a 2kg bag?</p> <p>3. Use a fact: $3 \times 75 = 225$ Use this fact to work out $450 \div 6 = \square$; $225 \div 0.6 = \square$. To multiply by 25 you multiply</p>

	<ol style="list-style-type: none"> 10. Multiple numbers up to 4 digits by a 2 digit number using a formal written method 11. Multiply and divide numbers mentally drawing upon known facts 12. Divide number up to 4 digit by a 1 digit using short division method 13. Solve division problems and interpret remainders appropriately for the context 14. Multiply whole numbers by 10, 100 and 1000 15. Multiply decimals to at least two decimal places by 10, 100 and 1000. 16. Recognise and use square numbers and the notation for squared 17. Recognise and use cube numbers and the notation for cubed 18. Solve problems involving \times and \div using knowledge of factors and multiples 19. Solve problems involving \times and \div using knowledge of squares and cubes 20. Solve multi-step problems involving $+$, $-$, \times and \div and a combination of these. 21. Solve missing number problems involving all four operations 22. Solve \times and \div problems, including scaling by simple fraction problems involving simple rates. 	<p>by 100 and then divide by 4. Use this strategy to solve $48 \times 25 = \square$, $78 \times 25 = \square$, $4.6 \times 25 = \square$</p> <p>4. Making links: $7 \times 8 = 56$. How can you use this fact to solve these calculations? $0.7 \times 0.8 = \square$; $5.6 \div 8 = \square$</p> <p>5. Always, sometimes, never?: Is it always, sometimes or never true that multiplying a number always makes it bigger? Is it always, sometimes or never true that prime numbers are odd? 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. Is it always, sometimes or never true that a square number has an even number of factors?</p> <p>6. Use the inverse: Use the inverse to check if the following calculations are correct: $4321 \times 12 = 51582$; $507 \div 9 = 4563$</p> <p>7. Size of an answer: The product of a two digit and three digit number is approximately 6500. What could the numbers be?</p> <p>8. Be able to demonstrate all of the above using manipulatives and a range of representations as well as written recordings.</p> <p>9. Be able to explain any Year 5 Multiplication and Division Concept to another pupil so that they understand it clearly.</p>
<p>Fractions</p>	<ol style="list-style-type: none"> 1. Compare and order fractions whose denominators are all multiples of the same number 2. Identify, name and write equivalent fractions of a given fraction including tenths and hundredths 3. Recognise mixed numbers and improper fractions and convert from one to the other (write mathematical statements $2/5 + 1/5 = 6/5 = 1 \frac{1}{5}$) 4. Add and subtract fractions with the same denominator 5. Add and subtract fractions with denominators that are multiples of the same number. 	<p>Demonstrate all elements of 'Y5 expected' in a range of contexts and types of problem solving (measurement; time; word problems; logic puzzles; finding all possibilities; true/false; finding and describing patterns and sequences).</p> <p>1. Spot the mistake: 0.088, 0.089, 1.0</p> <p>2. What comes next? 1.173, 1.183, 1.193</p> <p>3. What do you notice? One tenth of £41, One hundredth of £41; One thousandth of £41 Continue the pattern.</p>

6. Multiply proper fractions and mixed numbers by whole numbers.
7. Read and write decimal numbers as fractions.
8. Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.
9. Round decimals with two decimal places to the nearest whole number
10. Round decimals with two decimal places to one decimal place.
11. Read, write, order and compare numbers with up to 3dp.
12. Solve problems involving number up to three decimal places
13. Recognise the % symbol and understand that percent means number of parts per 100.
14. Write % as a fraction with denominator 100 and as a decimal fraction.
15. Write % as a decimal fraction
16. Solve problems which require knowing % and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{5}$, $\frac{2}{5}$ and $\frac{4}{5}$.
17. Solve problems which require knowing % and decimal equivalents of those with a denominator of a multiple of 10 or 25.

4. 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.

5. 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. $\frac{2}{5}$ of £2 is 20p

6. 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.

7. Ordering: 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?

8. Missing symbol: Put the correct symbol \leq or \geq in each box. $4.627 \square 4.06$; $12.317 \square 12.31$

9. What needs to be added to 3.63 to give 3.13? What needs to be added to 4.652 to give 4.1?

10. 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.

11. Top Tips: Explain how to round decimal numbers to one decimal place? (Also see rounding in place value).

12. Odd one out. Which is the odd one out in each of these collections of 4 fractions $\frac{6}{10}$ $\frac{3}{5}$ $\frac{18}{20}$ $\frac{9}{15}$ $\frac{30}{100}$ $\frac{3}{10}$ $\frac{6}{20}$ $\frac{3}{9}$. Why?

13. What do you notice? Fine $\frac{30}{100}$ of 2000. Find $\frac{3}{10}$ of 200. What do you notice? Can you write any other similar statements?

14. Complete the pattern in this table ($\frac{71}{100} = 0.71$ $\frac{??}{100} = 0.81$ $\frac{??}{100} = ???$ $\frac{??}{100} = ???$)

15. 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.

16. Ordering: Put these numbers in the correct order, starting with the largest. $\frac{7}{10}$, 0.73, $\frac{7}{100}$, 0.073, 71%

17. Explain your thinking: Which is more 20% of 200 or 25% of 180? Explain your reasoning

		<p>18. What do you notice? $\frac{3}{4}$ and $\frac{1}{4} = \frac{4}{4} = 1$, $\frac{4}{4}$ and $\frac{1}{4} = \frac{5}{4} = 1\frac{1}{4}$ $\frac{5}{4}$ and $\frac{1}{4} = \frac{6}{4} = 1\frac{1}{2}$</p> <p>19. Continue the pattern up to the total of 2. Can you make up a similar pattern for subtraction?</p> <p>20. The answer is $1\frac{2}{5}$. What is the question?</p> <p>21. Continue the pattern $\frac{1}{4} \times 3 =$, $\frac{1}{4} \times 4 =$, $\frac{1}{4} \times 5 =$, Continue the pattern for five more number sentences. How many steps will it take to get to 3?</p> <p>22. $\frac{5}{3}$ of 24 = 40. Write a similar sentence where the answer is 56.</p> <p>23. The answer is $2\frac{1}{4}$, what is the question?</p> <p>24. Give your top tips for multiplying fractions.</p> <p>25. Undoing: I divide a number by 100 and the answer is 0.33. What number did I start with?</p> <p>26. 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> <p>27. Be able to demonstrate all of the above using manipulatives and a range of representations as well as written recordings.</p> <p>28. Be able to explain any Year 5 Fractions Concept to another pupil so that they understand it clearly.</p>
<p>Measurement</p>	<ol style="list-style-type: none"> 1. Convert between different units of metric measure 2. Know and use equivalences of metric units and imperial units such as inches, pound and pints. 3. Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres 4. Calculate and compare the area of squares and rectangles including using standard units (cm²) 5. Estimate the area of irregular shapes 6. Estimate volume 7. Estimate capacity 8. Solve problems involving converting between units of time. 	<p>Demonstrate all elements of Y5 expected in a range of contexts and types of problem 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. 130000cm, 1.2m, 13m. Explain your thinking. £23.61, 2326p, 2623p. Explain your thinking. 2. Undoing: Imran's swimming lesson lasts 50 mins and it takes 15 mins to change and get ready for the lesson. What time

9. Use all four operations to solve problems involving all measure using decimal notation
10. Use scaling up and down to solve problems involving all measure using decimal notation

- does Imran need to arrive if his lesson finishes at 6.15pm?
3. **Explain thinking:** The time is 10.35am. Jack says that the time is closer to 11am than to 10am. Is Jack right? Explain why.
 4. **Write more statements:** One battery weighs the same as 60 paperclips; one pencil sharpener weighs the same as 20 paperclips. Write down some more things you know. How many pencil sharpeners weigh the same as a battery?
 5. **Testing Conditions:** If the width of a rectangle is 3 metres less than the length and the perimeter is between 20 and 30 metres, what could the dimensions of the rectangle be? Convince me.
 6. **Possibilities:** Adult tickets cost £8 and children's tickets cost £4. How many adult and children's tickets could I buy for £100 exactly? Can you find more than one way of doing this?
 7. **Always, sometimes, never:** If you double the area of a rectangle, you double the perimeter.
 8. **Working Backwards:** Put these times of the day in order, starting with the earliest time. A; Quarter to four in the afternoon B: 07:56 C: Six minutes to nine in the evening D: 14:36
 9. **The answer is ...**225 metres What is the question?
 10. **What do you notice?** 1:00pm = 13:00, 2:00pm=14:00 Continue the pattern.
 11. Be able to demonstrate all of the above using manipulatives and a range of representations as well as simple written recordings.

		<p>12. Be able to explain any Y5 measurement concept to another pupil so that they understand it clearly.</p>
<p>Geometry</p>	<ol style="list-style-type: none"> 1. Identify 3d shapes including cubes and cuboids from 2d representations 2. Know angles are measured in degrees; estimate and compare acute, obtuse and reflex angles. 3. Draw a given angle and measure in degrees. 4. Identify angles at a point and one whole turn. 5. Identify angles at a point on a straight line and $\frac{1}{2}$ a turn. 6. Identify other multiples of 90 degrees 7. Use the properties of rectangles to deduce related facts and missing lengths. 8. Use the properties of rectangles to deduce related facts and missing angles. 9. Distinguish between regular and irregular polygons based on reasoning about equal sides and angles 10. Identify, describe and represent the position of a shape following a reflection using the appropriate language 11. Identify, describe and represent the position of a shape following translation, using the appropriate language 12. 	<p>Demonstrate all elements of Y5 expected in a range of contexts and types of problem 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"> 2. 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? 3. Visualising: I look at a large cube which is made up of smaller cubes. If the larger cube is made up of between 50 and 200 smaller cubes what might it look like? 4. 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? 5. Always, sometimes, never: 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. 6. Other possibilities: A rectangular field has a perimeter between 14 and 20 metres. What could its dimensions be? Convince me. 7. Convince me: 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. 8. 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 coordinates of the original square? 9. Be able to demonstrate all of the above using manipulatives and a range of representations as well as simple written recordings.

		<p>10. Be able to explain any Y5 shape concept to another pupil so that they understand it clearly.</p> <p>11. Be able to explain any Y5 position and direction concept to another pupil so that they understand it clearly.</p>
<p>Statistics</p>	<ol style="list-style-type: none"> 1. Solve comparison, sum and difference problems using information presented in line graphs 2. Complete, read and interpret information in tables 3. Complete, read and interpret information in timetables 	<p>Demonstrate all elements of Y5 expected in a range of contexts and types of problem 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"> 2. True or false? (Looking at a train timetable) “If I want to go to Exeter by 4 o clock this afternoon, I will need to get to Taunton station before midday.” 3. Is this true or false? Convince me. Make up your own true or false statement about a journey using the timetable. 4. What’s the same, what’s different? Pupils identify similarities and differences between different representations and explain them to each other. 5. Create a question: Pupils ask (and answer) questions about different statistical representations using key vocabulary relevant to the objectives. 6. Be able to demonstrate all of the above using manipulatives and a range of representations as well as simple written recordings. 7. Be able to explain any Y5 statistics concept to another pupil so that they understand it clearly.