Griffe Field Progression in Mathematical Skills Map

National Curriculum

The national curriculum for mathematics aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Foundation Stage

Pupils should be taught to:

- count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number.
- use quantities and objects, add and subtract two single-digit numbers and count on or back to find the answer.
- solve problems, including doubling, halving and sharing.
- use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems.
- recognise, create and describe patterns.
- explore characteristics of everyday objects and shapes and use mathematical language to describe them.

Key Stage 1

The principal focus of mathematics teaching in key stage 1 is to ensure that pupils:

- develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources [for example, concrete objects and measuring tools].
- develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.
- know, by the end of year 2, the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.
- read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

Lower Key Stage 2

The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils:

- become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.
- develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.
- should, by the end of year 4, have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.
- should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

Upper Key Stage 2

The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils:

- extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.
- should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.
- should, by the end of year 6, be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.
- should read, spell and pronounce mathematical vocabulary correctly.

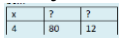
National Curriculum Statutory Requirements	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Number and place value		Pupils should be taught to: • Count to and across 100, forwards and backwards beginning with 0 or 1, or from any given number • Count, read and write numbers to 100 in numerals: count in multiples of twos, fives and tens • Given a number, identify one more and one less • Use the language: equal to, more than, less than (fewer), most, least • Identify and represent numbers using objects and pictorial representations including the number line • Read and write numbers from 1 to 20 in numerals and words.	Pupils should be taught to: • Count in steps of 2, 3 and 5 from 0 and in tens from any number, forwards and backwards. • Recognise the place value of each digit in a two- digit number (tens, ones) • Identify, represent and estimate numbers using different representations including the number line • Compare and order numbers from 0 up to 100: use < > and = signs • Read and write numbers up to at least 100 in numerals and in words • Use place value and number facts to solve problems.	Pupils should be taught to: • Count from 0 in multiples of 4,8,50 and 100 • Find 10 or 100 more or less than a given number • Recognise the place value of each digit in a three- digit number (hundreds, tens, ones) • Identify, represent and estimate numbers using different representations • Compare and order numbers from 0 up to 100: use < > and = signs • Read and write numbers up to at least 1000 in numerals and in words • Solve number problems and practical problems involving these ideas.	Pupils should be taught to: • Count in multiples of 6,7,9,25 and 1000 • Find 1000 more or less than a given number • Count backwards through zero to include negative numbers • Recognise the place value of each digit in a four- digit number (thousands, hundreds, tens and ones) • Order and compare numbers beyond 1000 • Identify, represent and estimate numbers using different representations • Round any number to the nearest 10,100 or 1000 • Solve number problems and practical problems that involve all of the above and with increasingly large positive numbers • Read Roman numerals to 100 (I to C) and know over time, the numeral system changed to include the concept of zero and place value.	Pupils should be taught to: • Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 • Read, write, order and compare numbers up to 1,000,000 and determine the value of each digit • Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero • Round any number up to 1,000,000 to the nearest 10,100 or 1000, 10,000 and 100,000 • Solve number problems and practical problems that involve all of the above • Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	Pupils should be taught to: • Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit • Round any whole number to a required degree of accuracy • Use negative numbers in context, and calculate intervals across zero • Solve number problems and practical problems that involve all of the above,

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Reasoning examples: number and place value		**Spot the mistake:** 5,6,8,9 What is wrong with this sequence of numbers? **True or False?** I start at 2 and count in twos. I will say 9 **What comes next?** 10+1 = 11 11+1= 12 12+1 = 13 **Do, then explain** Look at the objects.(in a collection). Are there more of one type than another? How can you find out?	**Spot the mistake**: 45,40,35,25 What is wrong with this sequence of numbers? **True or False?** I start at 3 and count in threes. I will say 13? **What comes next?** 41+5=46 46+5=51 51+5=56 **Do, then explain** 37 13 73 33 3 If you wrote these numbers in order starting with the smallest, which number would be third? Explain how you ordered the numbers. **Make up an example** Create numbers where the units digit is one less than the tens digit. What is the largest/smallest number?	**Spot the mistake**: 50,100,115,200 What is wrong with this quence of numbers? **True or False?** 38 is a multiple of 8? **What comes next?** 936-10= 926 926 -10 = 916 916- 10= 906 **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.	**Spot the mistake**: 950, 975,1000,1250 What is wrong with this sequence of numbers? **True or False?** 324 is a multiple of 9? **What comes next?** 6706+ 1000= 7706 7706 + 1000 = 8706 8706 + 1000 = 9706 **Do, then explain** 5035 5053 5350 5530 5503 If you wrote these numbers in order starting with the largest, which number would be third? Explain how you ordered the numbers. **Possible answers** A number rounded to the nearest ten is 540. What is the smallest possible number it could be? **What do you notice?** Round 296 to the nearest 10. Round it to the nearest 100. What do you notice? Can you suggest other numbers like this?	**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 **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. **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?	**Spot the mistake**: -80,-40,10,50 What is wrong with this sequence of numbers? **True or False?** When I count backwards in 50s from 10 I will say -200 **True or False?** The temperature is -3. It gets 2 degrees warmer. The new temperature is -5? **Do, then explain** Find out the populations in five countries. Order the populations starting with the largest. Explain how you ordered the countries and their populations. **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? **What do you notice?** Give an example of a six digit number which rounds to the same number when rounded to the nearest 10000 and 100000

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Number: addition and subtraction		Pupils should be taught to: • Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals(=) signs • Represent and use number bonds and related subtraction facts within 20 • Add and subtract one- digit and two – digit numbers to 20, including zero • Solve one- step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems.	Pupils should be taught to: • Solve problems with addition and subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures • Applying their increasing knowledge of mental and written methods • Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two digit number and ones, a two digit number and tens, two two-digit numbers, adding three one digit numbers • Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems.	Pupils should be taught to: • Add and subtract numbers mentally, including: a three-digit number and ones, a three digit number and tens, a three- digit number and hundreds • Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction • Estimate the answer to a calculation and use inverse operations to check answers • Solve problems, including missing number problems, using number facts, place value and more complex addition and subtraction.	Pupils should be taught to: • Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate • Estimate and use inverse operations to check answers to a calculation • Solve addition and subtraction two - step problems in contexts, deciding which operations and methods to use and why.	Pupils should be taught to: • Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • Add and subtract numbers mentally with increasingly large numbers • Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • Solve addition and subtraction multi - step problems in contexts, deciding which operations and methods to use and why.	Pupils should be taught to: • Preform mental calculations, including with mixed operations and large numbers • Use their knowledge of the order of operations to carry out calculations involving the four operations • Solve problems involving addition and subtraction multi - step problems in contexts, deciding which operations and methods to use and why. • Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Reasoning example: addition and subtraction		**Continue the pattern** 10 + 8 = 18 11 + 7 = 18 Can you make up a similar pattern for the number 17? How would this pattern look if it included subtraction? **Missing numbers** 9 + = 10 10 - = 9 What number goes in the missing box? **Working backwards** Through practical games on number tracks and lines ask questions such as "where have you landed?" and "what numbers would you need to throw to land on other given numbers?" **What do you notice?** 11 – 1 = 10 11 – 10 = 1 Can you make up some other number sentences like this involving 3 different numbers? **Fact families** Which four number sentences link these numbers? 12, 15, 3 **What else do you know?** If you know this: 12 – 9 = 3 what other facts do you know? **Missing symbols** Write the missing symbols (+ - =) in these number sentences: 17 3 20 18 20 2 **Convince me** In my head I have two odd numbers with a difference of 2. What could they be? Convince me **Missing numbers** Fill in the missing numbers (using a range of practical resources to support) 12 + = 19 **Making an estimate** Pick (from a selection of number sentences) the ones where the answer is 8 or 9. **Is it true that?** Is it true that 3+4 = 4 + 3?	**Continue the pattern** 90 = 100 – 10 80 = 100 – 20 Can you make up a similar pattern starting with the numbers 74, 26 and 100? **Missing numbers** 91 + = 100 100 - = 89 What number goes in the missing box? **True or false?** Are these number sentences true or false? 73 + 40 = 113 98 – 18 = 70 46 + 77 = 123 92 – 67 = 35 Give your reasons. **Hard and easy questions** Which questions are easy / hard? 23 + 10 = 93 + 10 = 54 + 9 = 54 + 1 = Explain why you think the hard questions are hard? **Other possibilities** ? + ? + = 14 What single digit numbers could go in the boxes? How many different ways can you do this? **Fact families** Which four number sentences link these numbers? 100, 67, 33 **What else do you know?** If you know this: 87 = 100 – 13 what other facts do you know? **Missing symbols** Write the missing symbols (+ - =) in these number sentences: 80 20 100 100 70 30 87 13 100 **Convince me** What digits could go in the boxes? 7 - 2 = 46 Try to find all of the possible answers. How do you know you have got them all? **Making an estimate** Which of these number sentences have the answer that is between 50 and 60 74 - 13 55 + 17 87 – 34 **Always, sometimes, Never** Is it always, sometimes or never true that if you add three numbers less than 10 the answer will be an odd number.	**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? **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 **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	**True or false?** Are these number sentences true or false?6.7 + 0.4 = 6.11 8.1 – 0.9 = 7.2 Give your reasons. **Hard and easy questions** Which questions are easy / hard? 13323 - 70 = 12893 + 300 = 19354 - 500 = 19954 + 100 = Explain why you think the hard questions are hard? **Convince me** - 666 = 8 5 What is the largest possible number that will go in the rectangular box? What is the smallest? Convince me **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 **Always, sometimes, never** Is it always, sometimes or never true that the sum of four even numbers is divisible by 4.	**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? **Convince me** + 1475 = 6 24 What numbers go in the boxes? What different answers are there? Convince me **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 **Always, sometimes, never** Is it always, sometimes or never true that the sum of four even numbers is divisible by 4.	**True or false?** Are these number sentences true or false? 6.32 +? = 8? = 1.68 Give your reasons. **Hard and easy questions** Which questions are easy / hard? 213323 - 70 = 512893 + 37 = 8193.54 - 5.9 = Explain why you think the hard questions are hard? **Missing symbols** Write the missing signs (+ - x ÷) in this number sentence: 6 12.3 = 61.9 11.9 **What else do you know?** If you know this: 86.7 + 13.3 = 100 what other facts do you know? **Convince me** Three four digit numbers total 12435. What could they be? Convince me **Making an estimate** Circle the number that is the best estimate to 932.6 - 931.05 1.3 1.5 1.7 1.9 **Always, sometimes, never** Is it always, sometimes or never true that the sum of two consecutive triangular numbers is a square number

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Number: multiplication and division		Pupils should be taught to: • Solve one- step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.	Pupils should be taught to: • Recall and use multiplication and division facts for the 2,5 and 10 multiplication tables, including recognising odd and even numbers • Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷), and equals (=) signs • Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • Solve problems involving multiplication and division using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in context.	Pupils should be taught to: • Recall and use multiplication and division facts for the 3,4 and 8 multiplication tables • 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 • 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.	Pupils should be taught to: • Recall multiplication and division facts for multiplication tables up to 12 x 12 • Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers • Recognise and use factor pairs and commutativity in mental calculations • Multiply two – digit and three- digit numbers by a one- digit number using formal and written layout • Solve problems involving multiplication and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.	Pupils should be taught to: • 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 • Multiply numbers up to 4 digits by a one- digit or two – digit number using a formal written method, including long multiplication for two – digit numbers • Multiply and divide numbers mentally drawing upon known facts • 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 • Multiply and divide whole numbers and those involving decimals by 10.100 and 1000 • Recognise and use square numbers (^{2}) and cubed (^{3}) • Solve problems involving multiplication and division including using their knowledge of factors and multiple, squares and cubes • Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equal signs • Solve problems involving multiplication and division including scaling by simple fractions and problems involving simple rates.	Pupils should be taught to: • Multiply muti – digit numbers up to 4 digits by a two- digit whole number using the formal written method of long multiplication • Divide numbers up to 4 digits by a two- digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context • Divide numbers up to 4 digits by a two- digit whole number using the formal written method of short division, where appropriate, interpret remainders as appropriate for the context • Preform mental calculations, including with mixed operations and large numbers • Identify common factors, common multiples and prime numbers • Use their knowledge of the order of operations to carry out calculations involving the four operations • Solve problems involving addition, subtraction multiplication and division multi - step problems in contexts, deciding which operations and methods to use and why. • Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Reasoning examples: multiplication and division		**Making links** *If one teddy has two apples, how many apples will three teddies have?* *Here are 10 lego people If 2 people fit into the train carriage, how many carriages do we need?* Practical *If we put two pencils in each pencil pot how many pencils will we need?* **Spot the mistake** Use a puppet to count but make some deliberate mistakes. *e.g.* 2 4 5 6 10 9 8 6 See if the pupils can spot the deliberate mistake and correct the puppet	**Missing numbers** 10 = 5 x ? What number could be written in the box? **Making links** *I have 30p in my pocket in 5p coins. How many coins do I have?* **Making links** Write the multiplication number sentences to describe this array X X X X X X What do you notice? Write the division sentences. **Prove It** Which four number sentences link these numbers? 3, 5, 15? Prove it. **True or false?** When you count up in tens starting at 5 there will always be 5 units. **Use the inverse** Use the inverse to check if the following calculations are correct: 12 ÷ 3 = 4 3 x 5 = 14	**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? **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 = **Prove It** What goes in the missing box?  Prove it. **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? **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. **Use the inverse** Use the inverse to check if the following calculations are correct 23 x 4 = 82 117 ÷ 9 = 14	**Missing numbers** 72 = ? x ? Which pairs of numbers could be written in the boxes? **Making links** Eggs are bought in boxes of 12. I need 140 eggs; how many boxes will I need to buy? **Use a fact** 63 ÷ 9 = 7 Use this fact to work out 126 ÷ 9 = 252 ÷ 7 = **Making links** How can you use factor pairs to solve this calculation? 13 x 12 (13 x 3 x 4, 13 x 3 x 2 x 2, 13 x 2 x 6) **Prove It** What goes in the missing box? 6 x 4? = 512 Prove it. **How close can you get?** ??? X 7 Using the digits 3, 4 and 6 in the calculation above how close can you get to 4500? What is the largest product? What is the smallest product? **Always, sometimes, never?** Is it always, sometimes or never true that an even number that is divisible by 3 is also divisible by 6. Is it always, sometimes or never true that the sum of four even numbers is divisible by 4. **Use the inverse** Use the inverse to check if the following calculations are correct: 23 x 4 = 92 117 ÷ 9 = 14	**Missing numbers** 6 x 0.9 = ? x 0.03 6 x 0.04 = 0.008 x ? Which numbers could be written in the boxes? **Making links** Apples weigh about 170 g each. How many apples would you expect to get in a 2 kg bag? **Use a fact** 3 x 75 = 225 Use this fact to work out 450 ÷ 6 = 225 ÷ 0.6 = To multiply by 25 you multiply by 100 and then divide by 4. Use this strategy to solve 48 x 25 78 x 25 4.6 x 25 **Making links** 7 x 8 = 56 How can you use this fact to solve these calculations? 0.7 x 0.8 = 5.6 ÷ 8 = **Prove It** What goes in the missing box? 12 ▢ 2 ÷ 6 = 212 14▢4 ÷ 7 = 212 22 ▢ 3 ÷ 7 = 321 r 6 323 x▢1 = 13243 Prove it. **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 **Use the inverse** Use the inverse to check if the following calculations are correct: 4321 x 12 = 51852 507 ÷ 9 = 4563	**Missing numbers** 2.4 ÷ 0.3 = ? x 1.25 Which number could be written in the box? **Use a fact** 12 x 1.1 = 13.2 Use this fact to work out 15.4 ÷ 1.1 = 27.5 ÷ 1.1 = **Making links** 0.7 x 8 = 5.6 How can you use this fact to solve these calculations? 0.7 x 0.08 = 0.56 ÷ 8 = **Prove It** What goes in the missing box? 18▢4 ÷ 12 = 157 38▢5 ÷ 18 = 212.5 33▢2 ÷ 8 = 421.5 38 x ▢.7 = 178.6 Prove it. **Can you find?** Can you find the smallest number that can be added to or subtracted from 87.6 to make it exactly divisible by 8/7/18? **Always, sometimes, never?** *Is it always, sometimes or never true that dividing a whole number by a half makes the answer twice as big.* Is it always, sometimes or never true that when you square an even number, the result is divisible by 4 Is it always, sometimes or never true that multiples of 7 are 1 more or 1 less than prime numbers. **Use the inverse** Use the inverse to check if the following calculations are correct: 2346 x 46 = 332796 27.74 ÷ 19 = 1.46

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Number: Fractions(including decimals and percentages)		Pupils should be taught to: • Recognise, find and name a half as one of two equal parts of an object, shape or quantity • Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.	Pupils should be taught to: • Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, set of objects or quantity • Write simple fractions for example, ½ of 6 = 3 and recognise the equivalence of 2/4 and ½.	Pupils should be taught to: • Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one- digit numbers or quantities by 10 • Recognise, find and write fractions of a discreet set of objects_ unit fractions and non - unit fractions with small denominators. • Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators • Recognise and show, using diagrams, equivalent fractions with the same denominators • Add and subtract fractions with the same denominator within one whole e.g. (5/7 + 1/7 = 6/7) • Compare and order unit fractions, and fractions with the same denominators • Solve problems that involve all of the above.	Pupils should be taught to: • Recognise and show, using diagrams, families of common equivalent fractions • Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten • Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number • Add and subtract fractions with the same denominator • Recognise and write decimal equivalents of any number of tenths or hundredths • Recognise and write decimal equivalent to ¼, ½, ¾ • Find the effect of dividing a one or two – digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths • Round decimals with 1 decimal place to the nearest whole number • Compare numbers with the same value of decimal places up to 2 decimal places • Solve simple measure and money problems involving fractions and decimals to two decimal places.	Pupils should be taught to: • 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 statement >1 as a mixed number • 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 (e.g. 0.71 = 71/100) • Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • Round decimals with two decimal places to the nearest whole number and to one decimal place • Read, write, order and compare numbers with up to three decimal places • Solve problems involving number up to three decimal places • 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, and as a decimal • Solve problems which require knowing percentage and decimal equivalents of ½, ¼, 1/5, 2/5./ 4/5 and those fractions with a denominator of a multiple of 10 or 25.	Pupils should be taught to: • Use common factors to simplify fractions; use common multiples to express fractions in the same denomination • Compare and order fractions, including fractions > 1 • Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions • Multiply simple pairs of proper fractions, writing the answer in its simplest form • Divide proper fractions by whole numbers • Associate a fraction with division and calculate decimal fraction equivalents for a simple fraction • Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places • Multiply one – digit number with up to two decimal places by whole numbers • Use written division methods in cases where the answer has up to two decimal places • Solve problems which require answers to be rounded to specified degrees of accuracy • Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Reasoning examples (Fractions, decimals and percentages)		**What do you notice?** Choose a number of counters. Place them onto 2 plates so that there is the same number on each half. When can you do this and when can't you? What do you notice? **True or false?** Sharing 8 apples between 4 children means each child has 1 apple.	**Spot the mistake** 7, 7 ½ , 8, 9, 10 8 ½, 8, 7, 6 ½, … and correct it **What comes next?** 5 ½, 6 ½ , 7 ½ , …., …. 9 ½, 9, 8 ½, ……, ….. **What do you notice?** ¼ of 4 = 1 ¼ of 8 = 2 ¼ of 12 = 3 Continue the pattern What do you notice? **True or false?** Half of 20cm = 5cm ¾ of 12cm = 9cm	**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, ….., ….., ….. **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 Give an example of a fraction that is less than a half. Now another example that no one else will think of. Explain how you know the fraction is less than a half. (draw an image) Ben put these fractions in order starting with the smallest. Are they in the correct order? One fifth, one seventh, one sixth	**Spot the mistake** sixty tenths, seventy tenths, eighty tenths, ninety tenths, twenty tenths … and correct it. **What comes next?** 83/100, 82/100, 81/100, ….., ….., …. 31/100, 41/100, 51/100, ….., ….., **What do you notice?** 1/10 of 100 = 10 1/100 of 100 = 1 2/10 of 100 = 20 2/100 of 100 = 2 How can you use this to work out 6/10 of 200? 6/100 of 200? **True or false?** 1/20 of a metre= 20cm 4/100 of 2 metres = 40cm Give an example of a fraction that is more than a half but less than a whole. Now another example that no one else will think of. Explain how you know the fraction is more than a half but less than a whole. (draw an image) **Missing symbol** Put the correct symbol < or > in each box 3.03 ☐ 3.33 0.37 ☐ 0.32 What needs to be added to 3.23 to give 3.53? What needs to be added to 3.16 to give 3.2? **Do, then explain** Circle each decimal which when rounded to the nearest whole number is 5. 5.3 5.7 5.2 5.8 Explain your reasoning	**Spot the mistake** 0.088, 0.089, 1.0 **What comes next?** 1.173, 1.183, 1.193 **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 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. 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? **Missing symbol** Put the correct symbol < or > in each box 4.627 ☐ 4.06 12.317 ☐ 12.31 What needs to be added to 3.63 to give 3.13? What needs to be added to 4.652 to give 4.1? **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	**Spot the mistake** Identify and explain mistakes when counting in more complex fractional steps **What do you notice?** One thousandth of my money is 31p. How much do I have? **True or false?** 25% of 23km is longer than 0.2 of 20km. Convince me. Give an example of a ***fraction*** that is greater than 1.1 and less than 1.5. Now another example that no one will think of. Explain how you know. Sam put these fractions in order starting with the smallest. Are they in the correct order? Thirty three fifths Twenty three thirds Forty five sevenths How do you know? **True or false?** In all of the numbers below, the digit 6 is worth more than 6 hundredths. 3.6 3.063 3.006 6.23 7.761 3.076 Is this true or false? Change some numbers so that it is true. What needs to be added to 6.543 to give 7? What needs to be added to 3.582 to give 5? Circle the two decimals which are closest in value to each other. 0.9 0.09 0.99 0.1 0.01 **Do, then explain** Write the answer of each calculation rounded to the nearest whole number 75.7 × 59 7734 ÷ 60 772.4 × 9.7 20.34 × (7.9 – 5.4)

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Reasoning examples(Fractions, decimals and percentages)			**Odd one out**. Which is the odd one out in this trio: ½ 2/4 ¼ Why? **What do you notice?** Find ½ of 8. Find 2/4 of 8 What do you notice? **Ordering** Put these fractions in the correct order, starting with the smallest. ½ ¼ 1/3	**Odd one out**. Which is the odd one out in each of these trios ½ 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 ¾ ¼ **What do you notice?** 1/10 + 9/10 = 1 2/10 + 8/10 = 1 3/10 + 7/10 = 1	**Odd one out.** Which is the odd one out in each of these trio s¾ 9/12 4/6 9/12 10/15 2/3 Why? **What do you notice?** Find 4/6 of 24 Find 2/3 of 24 What do you notice? Can you write any other similar statements? **Another and another** Write a decimal numbers (to one decimal place) which lies between a half and three quarters? … and another, … and another, … **Ordering** Put these numbers in the correct order, starting with the smallest. ¼ 0.75 5/10 Explain your thinking **What do you notice?** 5/5 – 1/5 = 4/5 4/5 – 1/5 = 3/5	**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? **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? **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, … **Ordering** Put these numbers in the correct order, starting with the largest. 7/10, 0.73, 7/100, 0.073 71% Explain your thinking Which is more: 20% of 200 or 25% of 180? Explain your reasoning. **What do you notice?** ¾ and ¼ = 4/4 = 1 4/4 and ¼ = 5/4 = 1 ¼ 5/4 and ¼ = 6/4 = 1 ½ Continue the pattern up to the total of 2. Can you make up a similar pattern for subtraction? The answer is 1 2/5 , what is the question?	**What's the same, what's different?** … when you round numbers to one decimal place and two decimal places? **Odd one out**. Which is the odd one out in each of these collections of 4 fraction s¾ 9/12 26/36 18/24 4/20 1/5 6/25 6/30 Why? **What do you notice?** 8/5 of 25 = 40 5/4 of 16 = 20 7/6 of 36 - 42 Can you write similar statements? **Another and another** Write a unit fraction which has a value of less than 0.5? … and another, … and another, … **Ordering** Which is larger, 1/3 or 2/5 ? Explain how you know. Put the following amounts in order, starting with the largest. 23%, 5/8, 3/5, 0.8 **Another and another** Write down two fractions which have a difference of 1 2/… and another, … and another, … **Another and another** Write down 2 fractionswith a total of 3 4/5. … and another, … and another, …

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Reasoning examples(Fractions, decimals and percentages)				**Continue the pattern** Can you make up a similar pattern for eighths? The answer is 5/10, what is the question? (involving fractions / operations)	**Continue the pattern** Can you make up a similar pattern for addition? The answer is 3/5, what is the question? What do you notice? 11/100 + 89/100 = 1 12/100 + 88/100 = 1 13/100 + 87/100 = 1 Continue the pattern for the next five number sentences **Undoing** I divide a number by 100 and the answer is 0.3. What number did I start with? **Another and another** Write down a number with one decimal place which when multiplied by 10 gives an answer between 120 and 130. … and another, … and another, …	**Continue the pattern** ¼ x 3 = ¼ x 4 = ¼ x 5 = Continue the pattern for five more number sentences. How many steps will it take to get to 3? 5/3 of 24 = 40 Write a similar sentence where the answer is 56. The answer is 2 ¼ , what is the question? **Undoing** I divide a number by 100 and the answer is 0.33 What number did I start with? **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, …	**Continue the pattern** 1/3 ÷ 2 = 1/6 1/6 ÷ 2 = 1/12 1/12 ÷ 2 = 1/24 What do you notice? ½ x ¼ = The answer is 1/8 , what is the question (involving fractions / operations)? **Undoing** I multiply a number with three decimal places by a multiple of 10. The answer is approximately 3.21 What was my number and what did I multiply buy? When I divide a number by 1000 the resulting number has the digit 6 in the units and tenths and the other digits are 3 and 2 in the tens and hundreds columns. What could my number have been?

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Measurement		**Pupils should be taught to:** • Identify compare, describe and solve practical problems for: lengths and heights (e.g. long/short,longer/shorter, tall/short, double/half) • mass/weight(e.g. heavy/light, heavier than, lighter than) • capacity and volume (e.g. full/empty, more than, less than, half, half full, quarter) • time (e.g. quicker, slower, earlier, later) • measure and begin to record the following: lengths and heights mass/weight capacity and volume time (hours, minutes, seconds) • recognise and know the value of different denominations of coins and notes • sequence events in chronological order using language (e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening) • recognise and use language relating to dates, including days of the week, weeks, months and years • tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.	**Pupils should be taught to:** • choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels • compare and order lengths, mass, volume/capacity and record the results using >, < and = • recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value find different combinations of coins that equal the same amounts of money • solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change • compare and sequence intervals of time tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times • know the number of minutes in an hour and the number of hours in a day	**Pupils should be taught to:** • measure, compare, add and subtract: lengths(m/cm/mm);mass (kg/g); volume/capacity (l/ml) • measure the perimeter of simple 2-D shapes • add and subtract amounts of money to give change, using both £ and p in practical contexts • 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 and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight • know the number of seconds in a minute and the number of days in each month, year and leap year • compare durations of events (for example to calculate the time taken by particular events or task).	**Pupils should be taught to:** • Convert between different units of measure(for example, kilometre to metre; hour to minute) • measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres • find the area of rectilinear shapes by counting squares • estimate, compare and calculate different measures, including money in pounds and pence • read, write and convert time between analogue and digital 12- and 24-hour clocks • solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.	**Pupils should be taught to:** • Convert between different units of 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 squares in centimetres and metres • calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes • estimate volume (for example, using 1 cm3 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.	**Pupils should be taught to:** • Convert solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate • Use, read, write and convert write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places • Convert between miles and kilometres • Recognise that shapes with the same areas can have different perimeters and vice versa • Recognise when it is possible to use formulae for area and volume of shapes • Calculate the area of parallelograms and triangles Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3), and extending to other units (for example, mm3 and km3).

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Reasoning examples(Measurement)		Compare, describe and solve practical problems for: * lengths and heights (e.g. long/short, longer/shorter, tall/short, double/half) * mass/weight (e.g heavy/light, heavier than, lighter than) * capacity and volume (e.g. full/empty, more than, less than, half, half full, quarter) * time (e.g. quicker, slower, earlier, later) **Top tips** How do you know that this (object) is heavier / longer / taller than this one? Explain how you know. sequence events in chronological order using language ([e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening) **Explain thinking** Ask pupils to reason and make statements about to the order of daily routines in school e.g. daily timetable e.g. we go to PE **after** we go to lunch. Is this true or false? What do we do before break time? etc.	Compare and order lengths, mass, volume/capacity and record the results using >, < and = **Top tips** Put these measurements in order starting with the smallest. 75 grammes 85 grammes 100 grammes Explain your thinking **Position the symbols** Place the correct symbol between the measurements > or < 36cm 63cm 130ml 103ml Explain your thinking Compare and sequence intervals of time **Undoing** The film finishes two hours after it starts. It finishes at 4.30. What time did it start? Draw the clock at the start and the finish of the film. **Explain thinking** The time is 3:15pm. Kate says that in two hours she will be at her football game which starts at 4:15. Is Kate right? Explain why.	**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 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 **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 100minutes is the same as 1 hour. Is Salha right? Explain why.	Estimate, compare and calculate different measures, including money in pounds and pence **Top Tips** Put these amounts in order starting with the largest. Half of three litres Quarter of two litres 300 ml Explain your thinking **Position the symbols** Place the correct symbols between the measurements > or < £23.61 2326p 2623p Explain your thinking **Undoing** Imran's swimming lesson lasts 50 mins and it takes 15 mins to change and get ready for the lesson. What time does Imran need to arrive if his lesson finishes at 6.15pm? **Explain thinking** The time is 10:35 am. Jack says that the time is closer to 11:00am than to 10:00am. Is Jack right? Explain why.	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) **Top Tips** Put these amounts in order starting with the largest. 130000cm2 1.2 m2 13 m2 Explain your thinking. **Undoing** A school play ends at 6.45pm. The play lasted 2 hours and 35 minutes. What time did it start? **Other possibilities** 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	Calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm 3) and cubic metres (m 3), and extending to other units such as mm 3 and km3 . **Top Tips** Put these amounts in order starting with the largest. 100 cm3 1000000 mm3 1 m3 Explain your thinking **Undoing** A film lasting 200 minutes finished at 17:45. At what time did it start? **Other possibilities** A cuboid has a volume between 200 and 250 cm cubed. Each edge is at least 4cm long. List four possibilities for the dimensions of the cuboid.

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Reasoning examples(Measurement)							

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Reasoning examples (Measurement)							

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Geometry: Properties of Shape		**Pupils should be taught to:** • recognise and name common 2-D and 3D shapes, including : rectangles, square, circles and triangles. 3-D shapes cuboids cubes pyramids and spheres.	**Pupils should be taught to:** • identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line • identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces • identify 2-D shapes on the surface of 3-D shapes, (for example, a circle on a cylinder and a triangle on a pyramid)	**Pupils should be taught to:** • draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them • 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.	**Pupils should be taught to:** • compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes • identify acute and obtuse angles and compare and order angles up to two right angles by size • identify lines of symmetry in 2-D shapes presented in different orientations • complete a simple symmetric figure with respect to a specific line of symmetry.	**Pupils should be taught to:** • identify 3-D shape, 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 (o) • identify: angles at a point and one whole turn (total 360 degrees) • angles at a point on a straight line and half a turn(total 180o) • other multiples of 90o • 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.	**Pupils should be taught to:** • draw 2-D shapes using given dimensions and angles • recognise, describe and build simple 3-D shapes, including making nets • compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons • illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius • recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Reasoning examples (Shape)							

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Geometry: Position and direction		**Pupils should be taught to:** • describe position, direction and movement, including whole, half, quarter and three quarter turns.	**Pupils should be taught to:** • order and arrange combinations of mathematical objects in patterns and sequences • use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angle	**Pupils should be taught to:**	**Pupils should be taught to:** • describe positions on a 2-D grid as coordinates in the first quadrant • describe movements between positions as translations of a given unit to the left/right and up/down • plot specified points and draw sides to complete a given polygon.	**Pupils should be taught to:** • 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.	**Pupils should be taught to:** • describe positions on the full coordinate grid (all four quadrants) • draw and translate simple shapes on the coordinate plane, and reflect them in the axes.

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Reasoning examples (Position and direction)							

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Statistics		**Pupils should be taught to:**	**Pupils should be taught to:** • Interpret and construct simple pictograms, tally charts, block diagrams and simple tables • ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity • ask and answer questions about totalling and comparing categorical data.	**Pupils should be taught to:** • interpret and present data using bar charts, pictograms and tables • solve one-step and twostep questions (for example, 'How many more?' and 'How many fewer?')	**Pupils should be taught to:** • interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. • solve comparison, sum and difference problems • using information presented in bar charts, pictograms, tables and other graphs.	**Pupils should be taught to:** • solve comparison, sum and difference problems using information presented in a line graph • complete, read and interpret information in tables, including timetables	**Pupils should be taught to:** • interpret and construct pie charts and line graphs and use these to solve problems • calculate and interpret the mean as an average.

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Reasoning examples (Statistics)							

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Ratio and Proportion							**Pupils should be taught to:** • Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts • solve problems involving the calculation of percentages (for example, of measures, and such as 15% of 360) and the use of percentages for comparison • solve problems involving similar shapes where the scale factor is known or can be found • solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Algebra							**Pupils should be taught to:** • use simple formulae • generate and describe linear number sequences • express missing number problems algebraically • find pairs of numbers that satisfy an equation with two unknowns • enumerate possibilities of combinations of two variables.