Year 5 Mathematicians

Mathematics is an essential life skill. Developed across centuries, mathematics is key feature of many parts of the wider world from history to science, engineering to hospitality, retail and beyond. Most forms of employment require the use of mathematics in some form and it is necessary for financial literacy. With this in mind, it is essential that children are engaged in their mathematics learning and are able to see how it fits into the wider world and our every day lives. So what better place to do this than at home! It is essential that the learning which takes place at school is reinforced at home where possible so that children have as many opportunities as possible to secure their learning and remember more.

What can families do?

Maths skills can be developed at home by involving them in everyday activities such as baking, looking at the best supermarket deals or sharing out sweets equally. This also develops their problem solving and reasoning skills! Don't underestimate yourself, or the power you have as a parent getting involved in your child's learning.

- **A positive mindset is EVERYTHING!** You may find yourself from time to time saying 'I was never good at Maths.' Children will pick up and mirror this energy. We would advise parents and carers to use positive language such as 'It's fine to make mistakes, we all do' or 'It's ok that you find this tricky, let's look through it together.' Positivity can go a long way to improving their attitude towards Maths.

- **Use Maths talk every day.** This could be as simple as asking your child to count the chicken nuggets and asking them whether the number of nuggets is a prime number or not. You could further develop their knowledge by asking questions such as: if this is a composite number, what are the factor pairs?

- **Develop their memory skills.** It has been found that the younger generation have little need to memorise things such as phone numbers. Start off with something simple like memorising a phone number. Make a game out of it to help develop their memory skills. This will soon develop into memorising times tables, addition facts, subtraction facts and many other mathematical skills.

- **Play maths games together.** Games have always been a fun way to engage children in their learning and a great bonding tool between adults and their children. Simple counting games, or games linked to their current objective in Maths, can support the children in engaging in their learning and retaining what they have learned.

- **Numbers and shapes are EVERYWHERE.** Help your child to recognise that numbers and shapes are everywhere. Asking them what the shape of a sign is on a walk or what number they see on the sign can be really important in developing their knowledge of Maths in real life contexts. This could be developed further by asking questions such as: is this a squared number? If you divided that number by 1000, what number would you now have?

TT Rockstars!

By the end of year 4 children are expected to rapidly and fluently recall multiplication and division facts for all of the times tables up to 12 x 12. To support this, we subscribe to Times Tables Rockstars to provide the children with a fun and engaging way of learning their tables facts. Each child has a login and there are a range of ways in which they can practise on the website. If your child is not secure in the recall of their times tables facts, they need to continue to practise as much as possible. We would expect your child to be logging on at least three times a week at home if this is the case. If your child is secure in this recall, they now need to begin to apply their knowledge in different contexts. Top marks is a great website with lots of games to support lots of concepts. If you have any further questions about this, please contact the Year 5 team.
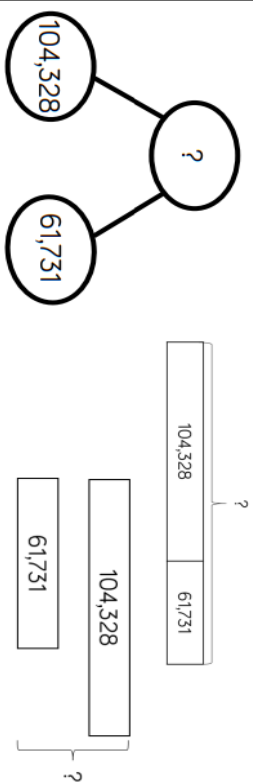
Doodle Maths

Doodle maths is a new tool for us at Parish. Each child has completed a baseline assessment which determines if they have any gaps in their learning. From here it then develops a bespoke programme of learning for each child so that they can close any gaps they have and enable them to become more confident mathematicians. Alongside this, class teachers are also able to set assignments for children to complete at home which further supports the learning taking place in class. All children have been given log-ins for Doodle maths and we expect children to be logging on at home to practise their mathematics at least three times a week. If you have any further questions about this, please contact the Year 5 team at
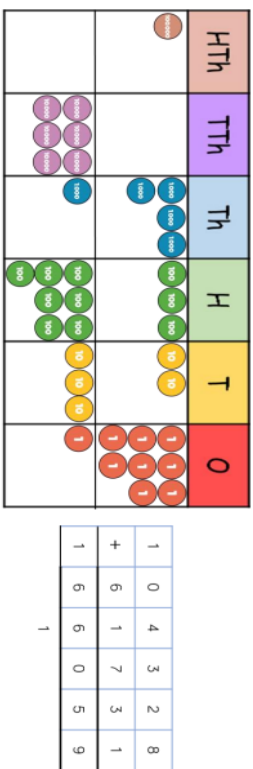year5@middletonparishce.rochdale.sch.uk.

Skill: Add numbers with more than 4 digits — Year: 5/6

Part-whole model: ? → 104,328 and 61,731

Bar model: ? over 104,328 | 61,731

$$104,328 + 61,731 = 166,059$$

Column method:

```
    1 0 4 3 2 8
  +   6 1 7 3 1
  ---------------
    1 6 6 0 5 9
        1
```
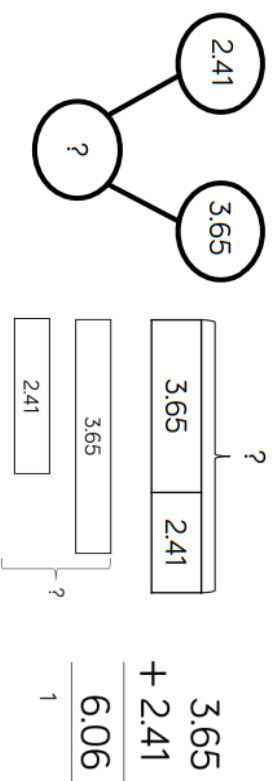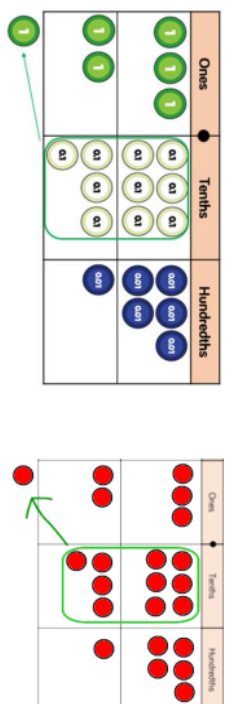
Place value counters or plain counters on a place value grid are the most effective concrete resources when adding numbers with more than 4 digits.

At this stage, children should be encouraged to work in the abstract, using the column method to add larger numbers efficiently.

Skill: Subtract numbers with more than 4 digits — Year: 5/6

Part-whole model: 294,382 → 182,501 and ?

Bar model: 294,382 over 182,501 | ?

$$294,382 - 182,501 = 111,881$$

Column method:

```
    2 9 ³4¹³ 3 8 2
  - 1 8   2   5 0 1
  ------------------
    1 1   1   8 8 1
```

Place value counters or plain counters on a place value grid are the most effective concrete resource when subtracting numbers with more than 4 digits.

At this stage, children should be encouraged to work in the abstract, using column method to subtract larger numbers efficiently.

Skill: Add with up to 3 decimal places — Year: 5

Part-whole model: ? → 2.41 and 3.65

Bar model: ? over 3.65 | 2.41

$$3.65 + 2.41 = 6.06$$

Column method:

```
    3.65
  + 2.41
  -------
    6.06
       1
```
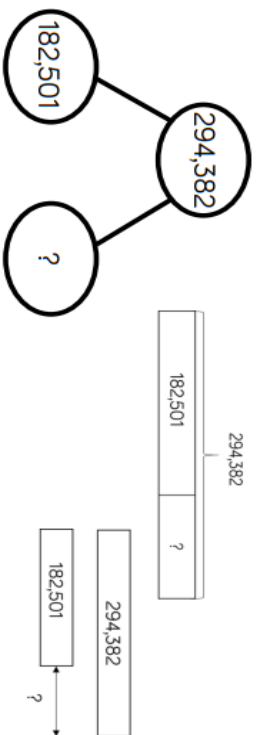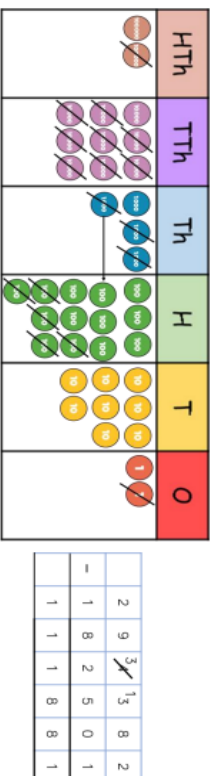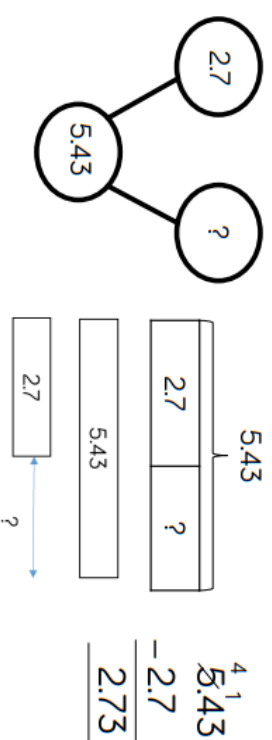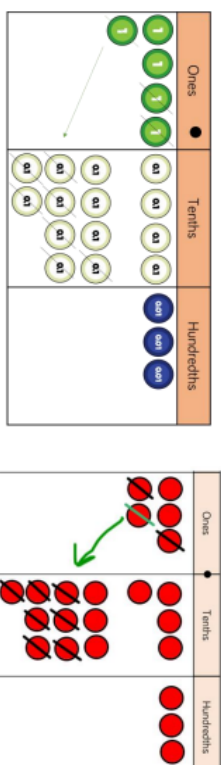
Place value counters and plain counters on a place value grid are the most effective manipulatives when adding decimals with 1, 2 and then 3 decimal places.

Ensure children have experience of adding decimals with a variety of decimal places. This includes putting this into context when adding money and other measures.

Skill: Subtract with up to 3 decimal places — Year: 5/6

Part-whole model: 5.43 → 2.7 and ?

Bar model: 5.43 over 2.7 | ?

$$5.43 - 2.7 = 2.73$$

Column method:

```
    ⁴5.⁴¹43
  -   2.7
  --------
    2.73
```
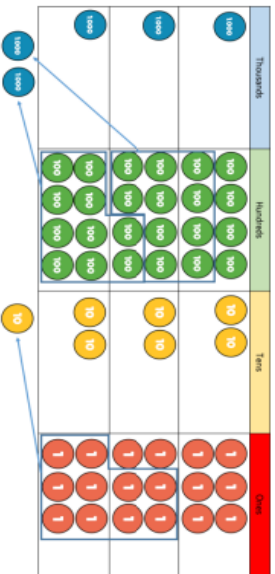
Place value counters and plain counters on a place value grid are the most effective manipulative when subtracting decimals with 1, 2 and then 3 decimal places.

Ensure children have experience of subtracting decimals with a variety of decimal places. This includes putting this into context when subtracting money and other measures.

$$1{,}826 \times 3 = 5{,}478$$

	Th	H	T	O
	1	8	2	6
×				3
		2	1	
	5	4	7	8

When multiplying 4-digit numbers, place value counters are the best manipulative to use to support children in their understanding of the formal written method.

If children are multiplying larger numbers and struggling with their times tables, encourage the use of multiplication grids so children can focus on the use of the written method.
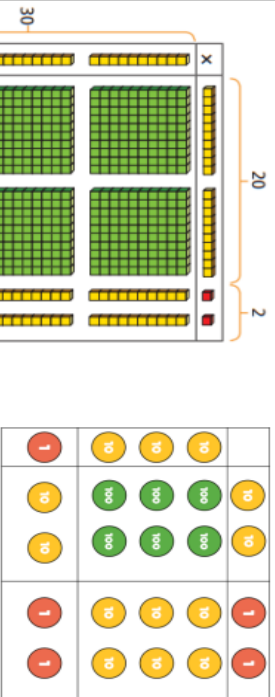
$$22 \times 31 = 682$$

×	20	2
30	600	60
1	20	2

	H	T	O
		2	2
×		3	1
		2	2
	6	6	0
	6	8	2

When multiplying a multi-digit number by 2-digits, use the area model to help children understand the size of the numbers they are using. This links to finding the area of a rectangle by finding the space covered by the Base 10.

The grid method matches the area model as an initial written method before moving on to the formal written multiplication method.

$$234 \times 32 = 7{,}488$$

×	200	30	4
30	6,000	900	120
2	400	60	8
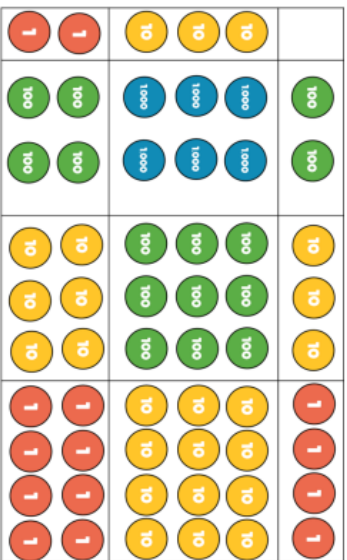
	Th	H	T	O
		2	3	4
×			3	2
		4	6	8
	7	0	2	0
	7	4	8	8

Children can continue to use the area model when multiplying 3-digits by 2-digits. Place value counters become more efficient to use but Base 10 can be used to highlight the size of numbers.

Children should now move towards the formal written method, seeing the links with the grid method.

$$2{,}739 \times 28 = 76{,}692$$

|	TTh	Th	H	T	O
		2	7	3	9
×				2	8
	2	1	9	1	2
	5	4	7	8	0
	7	6	6	9	2

When multiplying 4-digits by 2-digits, children should be confident in using the formal written method.

If they are still struggling with times tables, provide multiplication grids to support when they are focusing on the use of the method.

Consider where exchanged digits are placed and make sure this is consistent.
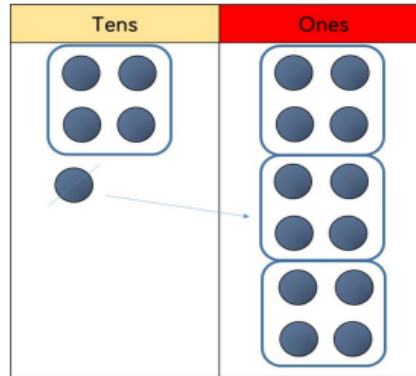
| Skill: Divide 2-digits by 1-digit (grouping)	Year: 5
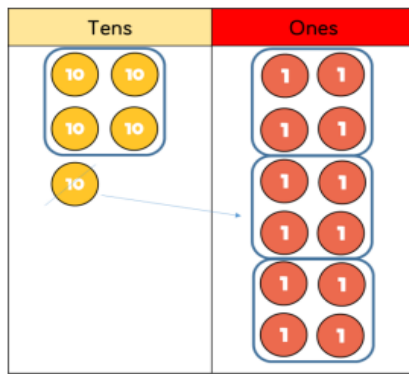
$$52 \div 4 = 13$$

When using the short division method, children use grouping. Starting with the largest place value, they group by the divisor.

Language is important here. Children should consider 'How many groups of 4 tens can we make?' and 'How many groups of 4 ones can we make?'
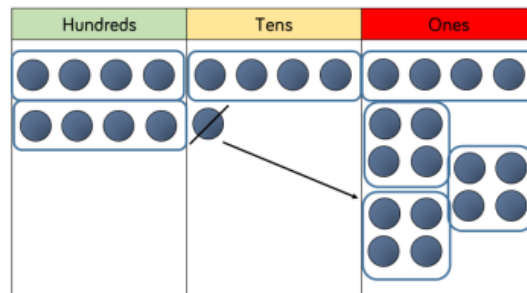
Remainders can also be seen as they are left ungrouped.

Skill: Divide 3-digits by 1-digit (grouping)	Year: 5
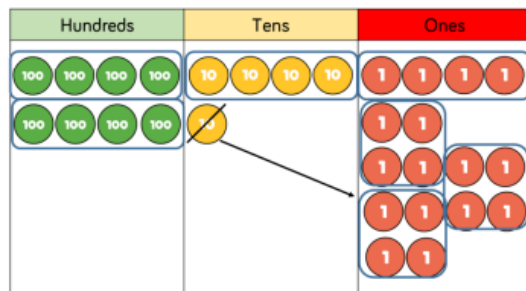
$$856 \div 4 = 214$$

Children can continue to use grouping to support their understanding of short division when dividing a 3-digit number by a 1-digit number.

Place value counters or plain counters can be used on a place value grid to support this understanding. Children can also draw their own counters and group them through a more pictorial method.

Skill: Divide 4-digits by 1-digit (grouping)	Year: 5
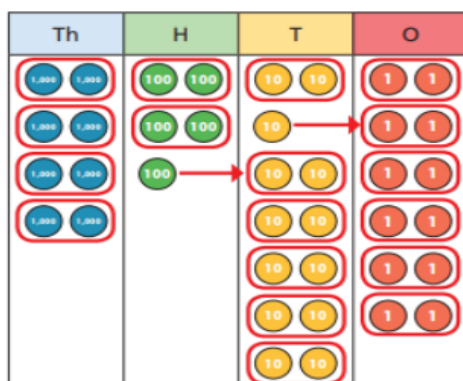
$$8,532 \div 2 = 4,266$$

Place value counters or plain counters can be used on a place value grid to support children to divide 4-digits by 1-digit. Children can also draw their own counters and group them through a more pictorial method.

Children should be encouraged to move away from the concrete and pictorial when dividing numbers with multiple exchanges.

Fluency and Rapid Recall of Number Facts

In order for children to become confident mathematicians and to be able to solve problems confidently, it is essential that they can re-call all addition and subtraction facts within 20 and that they are able to rapidly recall their multiplication and related division facts. Below is the progression of these facts within the curriculum. As you can see, children should be able to recall all the addition and related subtraction facts by the time they reach the end of year 1. However, not all children learn at the same pace and it is therefore important that we continue to revise and then apply these facts in different contexts on a daily basis. If your child is able to confidently recall all of these facts, practise using them to find other related facts. For example, if I know that 2 + 3 = 5, I also know that 2 tens (20) + 3 tens (30) = 5 tens (50) and 2 hundreds (200) + 3 hundreds (300) = 5 hundreds (500) and so on.

MIDDLETON PARISH CHURCH SCHOOL

Mathematics Progression Map: Key Number Facts

	Autumn Term	Spring Term	Summer Term
Reception	• Manipulating Numbers in preparation for Spring onwards • 1+1 • 2+1 • 2+2 • 3+1	• Number bonds to 5 • 2+2 • 3+1 • 2+3 • 4+1 • 3+3 • 4+2 • 5+1 • 5+2 • 4+3 • 6+1 • 4+4 • 5+5	• Number bonds to 5 • Number bonds to 10 • 4+2 • 5 + 2 • 6 + 2 • 7 + 2 • 4 + 3 • 5 + 3 • 6 + 3
Year 1	• 3+8 • 3+9 • 4+7 • 4+8 • 4+9 • 6 + 6 • 7 + 7 • 8 + 8 • 9 + 9 • 8 + 7 • 8 + 9	• 5 + 9 • 6 + 9 • 7 + 9 • 5 + 7 • 5 + 8 • 6 + 8 • 5 + 4 • 5 + 6 • 6 + 7 • 8 + 7 • 8 + 9 • 4 + 9	• X10 tables Consolidation of all previously taught facts
Year 2	• x5 tables • x2 tables	• Revise x2, x5 and x10 tables	• x3 tables **Consolidation of all previously taught facts making connections to facts within 100. For example: If I know that 6+4=10, I know that 60+40=100**
Year 3	• x4 tables • x8 tables	• Revise x8 tables • x11 tables	• x6 tables • Revise 3x, 4x, 8x, 11x and 6x
Year 4	• x9 tables • x12 tables	• x7 tables • Revise x9, x12 and x7 tables	• All tables
Year 5 **Year 6**	• Throughout Year 5 and 6 children revise all multiplication tables up to 12x12 and the corresponding division facts. For example: 5x8 = 40, 40/8 = 5, 40/5 = 8 • Children will also use all previously taught addition and subtraction facts to make connections within 10,000,000 and using decimal numbers. For example: If I know that 3+8 = 11, I know that 30,000+80,000=110,000 and I know that 0.3+0.8=1.1		

Practical Ways of Supporting Mathematics

One of the best ways in which to support your child's learning is to make it as practical as possible and to incorporate it into your every day routines. Here are some ways in which you could support your child's understanding of some of the mathematical concepts taught:

• **Fractions, decimals and percentages**—discuss offers in retail stores such as, 'Half price,' 'Up to 50% off,' '20% off' etc. Measurements very often make use of decimals along with money. Cooking and adapting recipes also often makes reference to fractions and decimals.

• **Time**—make use of timetables for trains and buses when out and about. Ask questions such as, what is the latest time we would need to catch the bus if we wanted to arrive at...? How long does it take to get from...to...?

• **Statistics**—explore tables and graphs in newspapers and magazines linked to a variety of topics.

Maths – End of Year 5 Expectations	
New National Curriculum Objectives	

Number and Place Value	interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero
	count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000
	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit
	read Roman numerals to 1 000 (M) and recognise years written in Roman numerals.
	round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000
	round decimals with two decimal places to the nearest whole number and to one decimal place
	solve number problems and practical problems that involve all of the above
Addition and Subtraction	add and subtract numbers mentally with increasingly large numbers
	add and subtract whole numbers with more than 4 digits, including using formal written methods
	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
Multiplication and Division	multiply and divide numbers mentally drawing upon known facts
	multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
	multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
	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
	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 (nonprime) numbers: establish whether a number up to 100 is prime and recall prime numbers up to 19
	recognise and use square numbers and cube numbers, and he notation
	solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
	solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
	solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates
Fractions	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
	compare and order fractions whose denominators are all multiples of the same number
	read, write, order and compare numbers with up to three decimal places
	round decimals with two decimal places to the nearest whole number and to one decimal place
	add and subtract fractions with the same denominator and multiples of the same number
	recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements
Decimals / Percentages	identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
	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
	recognise the per cent symbol (%) and understand that per cent relates to "number of parts per hundred", and write percentages as a fraction with denominator 100 as a decimal fraction
	multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
	solve problems involving numbers up to three decimal places
	solve problems which require knowing percentage and decimal equivalence
Algebra	use the properties of rectangles to deduce related facts and find **missing lengths and angles**
Measurement and Time	calculate and compare the area of squares and rectangles including using standard units and estimate the area of irregular shapes
	estimate volume (e.g)using 1 cm blocks to build cubes and cuboids) and capacity (e.g. using water)
	use all four operations to solve problems involving measure (e.g. **length, mass, volume, money**) using decimal notation including scaling.
	measure and calculate the **perimeter** of composite rectilinear shapes in centimetres and metres
	calculate and compare the area of squares and rectangles including using standard units
	solve problems involving converting between units of time
	convert between different units of metric measure
	solve problems involving converting between units of time
	understand and use equivalences between metric units and common imperial units such as inches, pounds and pints
Geometry Shape and Position	identify 3-D shapes, including cubes and other cuboids, from 2-D representations
	draw given angles, and measure them in degrees
	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
	know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
	Identify angles at a point and on a straight line
	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
Statistics	complete, read and interpret information in tables, including timetables
	solve comparison, sum and difference problems using information
	presented in a line graph