FOCUSMATHS

A positive approach to the Maths Curriculum

Year 6

By Clive Davies

First Published in the UK in 2016 by Focus Education (UK) Ltd

Focus Education (UK) Ltd
Publishing
Talking Point Conference & Exhibition Centre
Huddersfield Road
Scouthead
Saddleworth
OL4 4AG

Focus Education (UK) Ltd Reg. No 4507968

FRN: F258(6)

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Produced in Great Britain by Focus Education UK Ltd, Scouthead

ABOUT THE AUTHOR

Clive Davies, OBE is one of the founding Directors of Focus working with schools both nationally and internationally. He draws on a vast experience, including work as a headteacher, Ofsted inspector, trainer and consultant.

Clive has a wealth of experience working with schools to analyse their current position and supporting leaders to construct purposeful and fit-for-purpose self-evaluation systems which impact on pupil outcomes. Over recent years, Clive has been focusing particularly on the development of an approach to leading and delivering the curriculum which ensures a high degree of engagement for children. This approach to the curriculum is being used in schools across England. He is one of the innovators for the learning challenge curriculum which has gained national acclaim for its success. Clive works in all areas of school improvement and works from early years through to the secondary phase.

As a headteacher, Clive's school gained a National Curriculum Award and featured in the TES as one of three schools recognised for its quality practice. Awarded an OBE for Services to Education in 2009, he still works with schools on an advisory basis, and is a highly sought after key note speaker at conferences both nationally and internationally.

Clive has written a wide range of publications which have become known for their straight forward and useful style; helping school leaders focus on what is most important to making a difference, including the best-selling 'Raising Standards by Setting Targets'. Some of Clive's most recent and best selling publications are:

- Making Good Lessons Outstanding
- Maths Learning Challenge Curriculum: Pre and Post Learning Challenges
- Talk for Success
- Science Learning Challenge Curriculum
- History & Geography Learning Challenge Curriculum
- Leading the EYFS (co-authored with Sarah Quinn)
- Assessing Science and Non Core Subjects: In the new National Curriculum (Years 1 to 6)
- Focus on Maths (co-authored with Helen Rowland)
- Assessing without Levels
- Empowering Learners: A Focus on Learning Behaviours
- Step up to the Challenge Series
- Making Book Scrutiny more Meaningful

Contents

Special Note for Year 6 Teachers

Although the scheme has been set out in the same way as all the others –Year 1 to 5, taking up the full academic year, you may need to give consideration to ensure that full coverage of the Year 6 curriculum has occurred before the standardised tests in Summer 1.
As it stands, there are 6 units of work for the six half terms: from Autumn 1 to Summer 2. You may well have to give full consideration to condense each unit so that you will have covered everything by the end of Spring 2.
This can be done by aiming to cover 9 units in Autumn 1; and 8 units in Autumn 2; 8 in Spring 1 and 8 in Spring 2. You would forego the assessment unit at the end of each term and that should give you full coverage.

You can decide yourself which unit to cover when. I would recommend that you just move everything up. In other words the two fraction units and the geometry unit would be covered in Autumn 1. You would then move each unit up to meet the number of units per half term as suggested in the previous paragraph.

What is important is that you are very conscious of the units that you need to return to after the standardised tests have been completed.
It is important that your teacher assessment shows that as many pupils as possible have reached the national standard for Year 6 by the time they leave primary education.

In this way you are providing pupils with every chance to springboard on to a Grade A* to C in mathematics five years later.

Year 6: Overview of the year

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
1 Place value, including decimals	1 Fractions.	2 Place value	1 Addition, subtraction, multiplication and division	3 Place value	2 Algebra
1 Addition & Subtraction	2 Fractions, percentages, decimals and fractions	3 Geometry	1 Ratio and proportion	3 Addition & Subtraction	4 Addition & Subtraction
1 Multiplication & Division	2 Geometry Angles	3 Measurement	4 Geometry	4 Fractions	5 Fractions
1 Geometry 2D and 3D shape	1 Measurement Length, perimeter, mass	3 Fractions	5 Measurement	5 Geometry	2 Statistics
2 Addition & Subtraction	2 Measurement Area and volume	3 Multiplication & Division	1 Statistics (line graphs and pie charts)	1 Algebra	6 Geometry
2 Multiplication & Division	Consolidate and assess	4 Multiplication & Division	Consolidate and assess	6 Measurements	Consolidate and assess

YEAR 6: AUTUMN 1: Overview and Teaching Steps

WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
1 Place Value	**1 Four Rules**	**1 Multiplication & Division**	**1 Geometry**	**1 Addition & Subtraction**	**2 Multiplication & Division**
Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit.	-Perform mental calculations, including with mixed operations and large numbers. -Use knowledge of the order of operations to carry out calculations involving the four operations.	Identify common factors, common multiples and prime numbers.	Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.	Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.	Perform mental calculations, including mixed numbers and large numbers.
➢ Revise reading and writing numbers up to 1,000,000 ➢ Read numbers up to 10,000,000 in numerals ➢ Write numbers up to 10,000,000 in numerals ➢ Recognise the value of each digit up to 10,000,000 ➢ Know and use the terms: ones, tens, hundreds, ten thousands, hundred thousand, million and ten million correctly ➢ Partition any number up to 10,000,000 showing the value of each digit	Mentally: ➢ Use all 4 operations ➢ Calculate a problem using at least 2 operations ➢ Calculate 2-step problems ➢ Explain the order to solve calculations ➢ Solve calculations in correct order	➢ Know the common factors of any two given numbers ➢ Know the common multiples of any two given numbers ➢ Know all prime numbers.	➢ Classify triangles in terms of their properties ➢ Know that an equilateral triangle has three angles of 60° and three equal sides ➢ Know that an isosceles triangle has two sides which are equal and two angles which are equal ➢ Describe a right angled triangle according to its properties ➢ Know that angles in a triangle always total 180° ➢ Describe a square and a rectangle according to their properties ➢ Know the properties of: parallelogram, rhombus and trapezium ➢ Know that interior angles in a quadrilateral total 360° ➢ Accurately measure angles in any shape ➢ Accurately calculate missing angles in triangles and quadrilaterals on a line and at a point ➢ Sort and classify shapes according to similarities and differences	➢ Explain why an answer is or is not reasonable using estimation and rounding. ➢ Estimate an answer to a problem before calculating (being able to justify estimation).	➢ Use a range of numbers to multiply and divide.

Year 6: Autumn 1

Week 1: Place Value

Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit.

Autumn 1: Week 1: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Autumn 1: Week 1
Objective: Place Value	Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit.

Write these numbers in numerals			***Write these numbers in words***		
Two hundred thousand, four hundred and fourteen			1,122,461		
One million, thirteen thousand, three hundred and sixty-four			5,123,879		
Five million, two hundred and four thousand, one hundred and sixteen			2,015,247		
Six million, four hundred thousand, three hundred and eighty- three			1,998,392		
Five million, sixty thousand, four hundred and five			9,719,709		

Autumn 1: Week 1: Practice and Consolidation

Place Value: Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Revise reading and writing numbers up to 1,000,000 ➢ Read numbers up to 10,000,000 in numerals ➢ Write numbers up to 10,000,000 in numerals ➢ Recognise the value of each digit up to 10,000,000 ➢ Know and use the terms: ones, tens, hundreds, ten thousands, hundred thousand, million and ten million correctly ➢ Partition any number up to 10,000,000 showing the value of each digit	• Start by revising reading and writing numbers to 10,000, 100,000 and 1,000,000. Reminding pupils of place value. • Chant in thousands beyond 100,000 and 100,000 up to 1,000,000. • Half the class are given numbers in words and the other half have numbers. In turn a pupil with the words stands up from one side and the person, on the other side, with the corresponding number has to react as quickly as possible. • In small groups pupils play a bingo style game or a snap game involving words and numbers.	What is the value of the digit 6 in these numbers? 6787555 95467754 8789623 1678256 11658723 5423986 Write the next three numbers that follows: 1,234,567 347,912 4,982,230 4,789,230 1,265, 899 2,670,002 Say what the digit 8 stands for in each of these numbers: 1,280,992 8,234,765 1,809,235, 1,296,098 1,478,907 2,687,090 3,002,807 4,967,082 **Card Game**: In groups of 4 to 6 Each is given a 7 digit number. There is a set of cards which has 1,000,000 to 10,000,000; 100,000 to 900,000; 10,000 to 90,000; 1,000 to 9,000; 100 to 900; 10 to 90; and 1 to 9. These cards are mixed up and placed face down in the middle. Each player picks up a card at a time and checks to see if that number is part of the original number they were given, ie, I pick up 900,000 and my number is 1, 934,892. The first to collect all the numbers is the winner.

Autumn 1: Week 1: Mastering this Objective – Deeper Understanding

Place Value: Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit.

Teaching Sequence

- Revise reading and writing numbers up to 1,000,000
- Read numbers up to 10,000,000 in numerals
- Write numbers up to 10,000,000 in numerals
- Recognise the value of each digit up to 10,000,000
- Know and use the terms: ones, tens, hundreds, ten thousands, hundred thousand, million and ten million correctly
- Partition any number up to 10,000,000 showing the value of each digit

If pupils have mastered this objective they will be able to complete these activities independently:

Create seven digit numbers where the digit sum is 9 and the tens of thousands digit is 2. e.g. 4,020,201

What is the largest/smallest number you can make?

Now, create eight digit numbers where the digit sum is 14 and the hundred thousands digit is 2. e.g. 11,260,202

What is the largest/smallest number you can make?

Find 3 consecutive numbers above 1000.
- The first has to be a multiple of 2
- The second a multiple of 3
- The third a multiple of 4.

Find 3 consecutive numbers above 10000.
- The first has to be a multiple of 3
- The second a multiple of 4
- The third a multiple of 5.

Now find some more.
What do you notice?

Write the number that comes directly before and after the centre number:

	10,875,349	
	21,987,346	
	7,923,900	
	3,982,901	
	4,892,000	

Write the following words in numbers:

Six million, two hundred and sixty-five thousand, seven hundred and six.

One million, two hundred and fourteen thousand, three hundred and fifty.

Six million, nine hundred and four thousand, four hundred and fourteen.

Autumn 1: Week 1: Working at greater depth

Place Value: Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit.

Teaching Sequence

- Revise reading and writing numbers up to 1,000,000
- Read numbers up to 10,000,000 in numerals
- Write numbers up to 10,000,000 in numerals
- Recognise the value of each digit up to 10,000,000
- Know and use the terms: ones, tens, hundreds, ten thousands, hundred thousand, million and ten million correctly
- Partition any number up to 10,000,000 showing the value of each digit

Activities for pupils working at greater depth:

Take any 8 cards with a single digit on it.
Make up as many 8-digit numbers as you can.
Write five of them out in words.
Choose another 8 cards with different digits on.

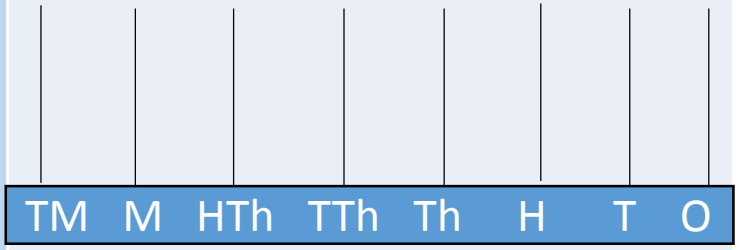
How many numbers can you make?
What do you notice?

Write the next two numbers in this sequence:

- Eleven million, two hundred and forty thousand, six hundred and thirty five:
- 11,140,635;
- Eleven million, forty thousand; six hundred and thirty-five;
- 10,940,635

Make up 8-digit numbers, with the numbers shown. The first digit has to be a 1.
Make a pair of 8-digit numbers which are less than 100,000 apart.
Make a pair of 8-digit numbers that are more than 500,000 apart.
Make up a pair of 8-digit numbers that are less than 50,000 apart.
Now think up some for yourself to give to your friends.

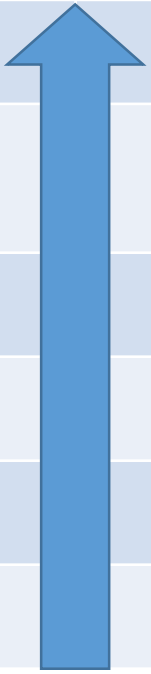
Look at the abacus below. You have 35 beads to place where you wish. If you have to put a bead in each of the pegs what are the smallest and largest numbers you can make? Now make up more to a given specification.



Autumn 1: Week 1: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Place Value: Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit.	Me	My Teacher
Can you partition any number up to 10,000,000 showing the value of each digit?		
Do you know and use terms: units; tens, hundreds, thousands, ten thousands, hundred thousands, one million and ten million correctly?		
Can you recognise the value of each digit up to 10,000,000?		
Can you read and write numbers to 10,000,000?		
Can you read and write number to 1,000,000?		
Can you remember reading and writing numbers to: 1000 and then to 100,000?		



Year 6: Autumn 1

Week 2: Four Rules

-Perform mental calculations, including with mixed operations and large numbers.
-Use knowledge of the order of operations to carry our calculations involving the four operations.

Autumn 1: Week 2: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Autumn 1: Week 2
Objective: Four Rules	-Perform mental calculations, including with mixed operations and large numbers. -Use knowledge of the order of operations to carry out calculations involving the four operations.

Complete these rapidly:

6 x 7			(3 x4) + 15		
60 x 7			3 x 5 + (9 -2)		
600 x 7			72 ÷ 8 + 6		
50 x 5			99 ÷ 11 + (90 x 2)		
70 x 8			4 x 5 + (6 x 7)		
100 x 7			7 x 8 + 99		
80 x 4			23 + 8 x 9		
90 x 9			(87 + 67) + 23		

Autumn 1: Week 2: Practice and Consolidation

Four Rules: -Perform mental calculations, including with mixed operations and large numbers.
-Use knowledge of the order of operations to carry out calculations involving the four operations.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
Mentally: ➢ Use all 4 operations ➢ Calculate a problem using at least 2 operations ➢ Calculate 2-step problems ➢ Explain the order to solve calculations ➢ Solve calculations in correct order	• Revise the standard basic skills that pupils ought to know, including all times tables to x12, including inverses and rapid response out of order. • Introduce the term BODMAS (Brackets; of; division; multiplication; addition and subtraction) as a way of determining the order of operations. • Huge expectation that by Year 6 pupils are secure with basic number facts which will include addition and subtractions which cross 100, 1000, etc.	Time yourself with a partner. Give yourself 2 minutes each and have a set of times table questions to x12 ready. These would include multiples of 10, ie, not just 7 x 6 but also 70 x 6. The idea is that you have made lists to test each other and then see how many you get through in 2 minutes. Checking multiples of 10 and 100: 7 x 6 70 x 6 700 x 6 7000 x 6 8 x 5 80 x 5 800 x 5 8000 x 5 9 x 6 90 x 6 900 x 6 9000 x 6 Now make up some more to give to your friend. Order of calculations: Calculate the following remembering the order for calculations: 34 + 56 + (5 x 8) 87 – (36 ÷ 4) + 7 76 + 34 + (45 – 23) 65 x 3 + 32 12 x 4 – 5 45 – 56 90 + 12 + (12 x 3) 90 + 23 + (3 x 4) 117 – 78 + (56 x 2) 90 + 34 x (45 x 2) 125 ÷ 5 x 6 91 – 23 x 4 Complete these very rapidly without using pencil and paper: 97 + 23 125 – 27 89 + 14 90 + 45 86 + 18

Autumn 1: Week 2: Mastering this Objective – Deeper Understanding

Four Rules: -Perform mental calculations, including with mixed operations and large numbers.
-Use knowledge of the order of operations to carry out calculations involving the four operations.

Teaching Sequence

Mentally:

- Use all 4 operations
- Calculate a problem using at least 2 operations
- Calculate 2-step problems
- Explain the order to solve calculations
- Solve calculations in correct order

If pupils have mastered this objective they will be able to complete these activities independently:

Cake Factory

In a factory where they make cakes, 2280 are made each day.
Half of these go to the icing department and 560 are sent to a major supermarket.
The rest are distributed equally to 10 smaller cake shops.
How many go to the icing department and how many are distributed to each cake shop?

Paper Delivery

Sam has a paper round.
He delivers 470 papers each week.
30 houses have 1 newspaper every day of the week.
10 houses have 2 papers every day of the week.
All the others just have one Sunday newspaper.
To how many houses does Sam deliver on Sunday?

Breakfast Time

At the local café the breakfast menu is:

Full English Breakfast	£3.45
Bacon and Egg	£1.75
Bacon Roll	£1.45
Sausage Bap	£1.55
Cereal	£1.25
Danish Pastry	95p
Tea £1,15	Coffee £1.45
Orange Juice 80p	

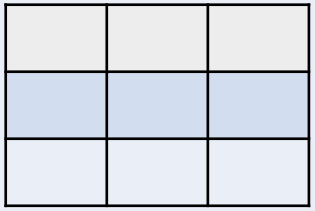
Henry and Sally have £6 between them.
Show 3 different ways that they could spend their money so that they both have something to eat and drink.

Theatre Outing

Mum and Dad decide to take their two children to see the latest production of 'The Frozen Princess'.
They decide to have a special theatre meal beforehand and to buy some souvenirs.
The tickets cost £30 for adults and £20 for children; the meal costs £20 for adults and £12 for children. In total they spent £32 on the souvenirs.
Mum has bought £200 with her. Did she have enough or did she have to use her credit card?

Autumn 1: Week 2: Working at greater depth

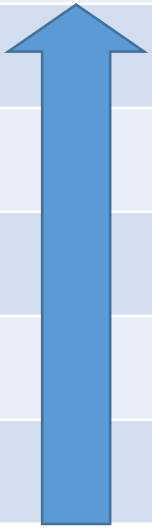
Four Rules: -Perform mental calculations, including with mixed operations and large numbers.
-Use knowledge of the order of operations to carry out calculations involving the four operations.

Teaching Sequence	Activities for pupils working at greater depth	
Mentally: ➢ Use all 4 operations ➢ Calculate a problem using at least 2 operations ➢ Calculate 2-step problems ➢ Explain the order to solve calculations ➢ Solve calculations in correct order	**Bucket Weight** A bucket weighs 8 kilograms when full of water and it weighs 4.8 kilograms when half full of water. What does it weigh when it is a quarter full of water? A suitcase weighs 28 Kg when it is full; it weighs 12 Kg when it is half full. How much does it weigh when it is a quarter full? **Dealing with products** • The product of a 2-digit number and a number with two decimal places is 21.34 • What could the numbers be? • The product of another 2-digit number and a number with two decimal places is 34.02 • What could the numbers be? • The product of a third 2-digit number and a number with two decimal places is 69.12 What could the numbers be? Explain your workings	**Getting closer** Find the smallest number that can be added to, or subtracted, from 87.6 to make it exactly divisible by 8 and 7 and 18. How did you go about solving this? Explain your reasoning. **Matrix Fun** Look at the 3 x 3 matrix below:  Using the numbers 1 to 9 once, place them in the spaces available. You have 3, 3-digit numbers if you look across the rows and another 3 if you look at the columns. Place the numbers in such a way that when you add the sum of the rows and take away the sum of the columns, your answer will be as close to 100 as you can make it. Now try again and get as close to 500 as possible.

Autumn 1: Week 2: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Four Rules: -Perform mental calculations, including with mixed operations and large numbers. -Use knowledge of the order of operations to carry out calculations involving the four operations.	Me	My Teacher
Do you seek to improve your response time to basic calculations involving all four rules?		
Can you tackle a problem with several different operations knowing which to deal with first?		
Do you know the order you should tackle a problem with several different operations?		
Can you expand your instantaneous responses to include multiples of 10, eg, 60 x 7?		
Can you confidently respond instantaneously to any times table (to x12) question you are given?		



Year 6: Autumn 1

Week 3: Multiplication and Division

Identify common factors, common multiples and prime numbers.

Autumn 1: Week 3: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Autumn 1: Week 3
Objective: Multiplication & Division	Identify common factors, common multiples and prime numbers.

Name 3 prime numbers that are greater than 10.			12 and 16 have common factors. What are they?		
			25 and 35 have a common factor. What is it?		
Name another 3 prime numbers that are between 50 and 100.					
			Set out all the factors in 100.		
Name 2 common multiples of 6 and 8.			Name 2 common multiples of 16 and 18.		
Name 2 common multiples of 5 and 8.			Name 2 common multiples of 16 and 24.		

Autumn 1: Week 3: Practice and Consolidation

Multiplication & Division: Identify common factors, common multiples and prime numbers.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Know the common factors of any two given numbers ➢ Know the common multiples of any two given numbers ➢ Know all prime numbers.	• Much of this unit builds on previous learning but we now need to heighten levels of confidence amongst pupils. • Ensure pupils are confident with terms such as 'prime numbers'; 'factors' and 'multiples'. • Part of the focus of the unit should be on rapid response – indicating confidence.	**Guess my number:** • I am a prime number and I live between 10 and 20. 8 is almost half of me. • I am not a prime number but am a multiple of 4. I live between 25 and 30. • I am the first 3-digit prime number. • I am the last prime number in the 60s. **Common Multiples:** Say which common multiples these pairs share: 25 and 10; 24 and 36; 20 and 12; 9 and 12 16 and 14; 18 and 14; 3 and 16; 9 and 8; **Common Factors:** Say which common factors these pairs share: 12 and 16 24 and 16 18 and 20 15 and 9 121 and 33 60 and 35 88 and 100 28 and 35 **Prime Numbers** Name the 5th prime number if 1 is the first. Name the prime numbers that are in the 20s. Name the first prime number that is between 65 and 75. Describe a prime number.

Autumn 1: Week 3: Mastering this Objective – Deeper Understanding

Multiplication & Division: Identify common factors, common multiples and prime numbers.

Teaching Sequence	If pupils have mastered this objective they will be able to complete these activities independently:	
➢ Know the common factors of any two given numbers ➢ Know the common multiples of any two given numbers ➢ Know all prime numbers.	Think of a number and come up with 4 facts about it that may include: factor; multiple; prime or not a prime number; square number or cubed number; odd or even. Here is an example: • I am in the forties: • I am a multiple of 4 • I am unusual because I have two identical digits • I am not a prime number If you played this with your friends you could get them to guess after each clue and you could respond with 'higher' or 'lower'.	I count on from 22, what will be the fifth prime number I will say? I count back from 40, how many prime numbers will I say before I reach 20? I count in twos from 14. Why will it be impossible for me to say a prime number? I count on in 3s from 19. How many multiples of 4 will I say before I say 50?
	I start at 20 and count on until 50. How many multiples of 5 will I say? How many multiples of 7 will I say? I start at 11 and count on to 45. How many numbers will I say that have 3 as a factor? How many numbers will I say that have 7 as a factor? How many numbers will I say that have 11 as a factor?	Think of a Year: *All the years have 4 digits.* My first digit is a number that when multiplied by itself stays the same. My second digit is a square number and also a multiple of 3. My third digit is a factor of 12 but is not a prime number. My fourth digit is cubed number and higher than 5. Now make up some dates of your own. Be sure that the digits can only be one number.

Autumn 1: Week 3: Working at greater depth

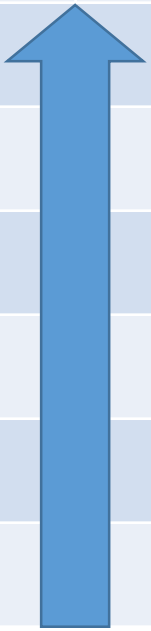
Multiplication & Division: Identify common factors, common multiples and prime numbers.

Teaching Sequence	Activities for pupils working at greater depth:	
➢ Know the common factors of any two given numbers ➢ Know the common multiples of any two given numbers ➢ Know all prime numbers.	**My Age** • My age this year is a multiple of 8. Next year it will be a multiple of 7. How old am I? • Last year my age was a square number. Next year it will be a cubed number. How old am I? How long do I have to wait until my age is both a square number and a cubed? • My mum was 27 when I was born. 8 years ago she was twice as old as I shall be in 5 years time How old am I now?	**Consecutive Numbers** Think of three consecutive numbers where the first is a multiple of 2; the second a multiple of 3; and the third a multiple of 4. Think of another three consecutive numbers where the first is a multiple of 9; the second a multiple of 8 and the third a multiple of 5. Think of yet another three consecutive numbers where the first is a multiple of 7; the second a multiple of 8; and the third a multiple of 5.
	Guess Who I am? Make up some 'Guess who I am?' questions. Your clue has to include one of the following: factors; prime numbers or not a prime number; multiples or square numbers. You could create a game if you make up enough 'Guess who I am?' questions. Your 'Guess who I am?' questions could be put on a card and the corresponding numbers put on another set of cards. You could then play 'pairs' or even 'snap.'	**Combined ages** The combined age of Aliyah and Bethany is 43. The combined age of Aliyah and Charlotte is 55. The combined age of Charlotte and Bethany is 66. What is the combined age of Aliyah, Bethany and Charlotte? How old is Aliyah?

Autumn 1: Week 3: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Multiplication & Division: Identify common factors, common multiples and prime numbers.	Me	My Teacher
Can you identify common multiples in two given numbers?		
Can you identify common factors in two given numbers?		
Can you name all prime numbers to 100?		
Do you know what a multiple is?		
Do you know what a factor is?		
Do you know what a prime number is?		



Year 6: Autumn 1

Week 4: Geometry

Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.

Autumn 1: Week 4: Pre-Learning Task

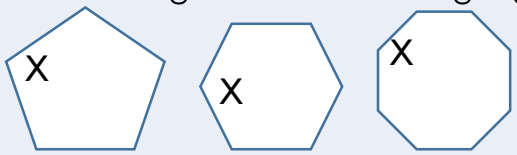
The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Autumn 1: Week 4
Objective: Geometry	Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.

Answer these questions about triangles			***Answer these questions about rectangles***		
What is the name of a triangle that has three equal sides?			What is a quadrilateral?		
What is the name of a triangle that has two equal sides and two equal angles?			If three angles of a quadrilateral measure 40°; 80° and 110°, what is the fourth angle?		
What is the name of a triangle that has a 90°?			What is similar and different between a square and a rhombus?		
Why can you not have a triangle with two 90° angles			Name 4 types of quadrilaterals		

Autumn 1: Week 4: Practice and Consolidation

Geometry: Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Classify triangles in terms of their properties ➢ Know that an equilateral triangle has three angles of 60° and three equal sides ➢ Know that an isosceles triangle has two sides which are equal and two angles which are equal ➢ Describe a right angled triangle according to its properties ➢ Know that angles in a triangle always total 180° ➢ Describe a square and a rectangle according to their properties ➢ Know the properties of: parallelogram, rhombus and trapezium ➢ Know that interior angles in a quadrilateral total 360° ➢ Accurately measure angles in any shape ➢ Accurately calculate missing angles in triangles and quadrilaterals on a line and at a point ➢ Sort and classify shapes according to similarities and differences	• There are many revisory aspects to this unit. However, this unit is designed to ensure that pupils are very confident in knowing the properties of triangles and quadrilaterals. • There are many terminologies for pupils to get used to, some they will have met before. • Make sure pupils know and are familiar with the terms equilateral; isosceles; quadrilateral; rhombus; trapezium; rectangle; square and parallelogram. • Make sure pupils know how to measure angles of both triangles and quadrilaterals.	Draw a triangle that has one side of 8cm and an angle of 65° and another of 35°. Draw another that has one side of 10cm a 90° angle and another angle of 60° Describe the properties of the following: • Equilateral triangle • Isosceles triangle • Scalene triangle • Right-angled triangle Quadrilateral Rhombus Trapezium Parallelogram A triangle has two angles of 65° and 70°, what is the third angle? A triangle has two angles of 35° and 75°, what is the third angle? A quadrilateral has three angles of 65° and 110° and 45°, what is the fourth angle? Another quadrilateral has three angles of 85° and 120° and 55°, what is the fourth angle? Find the angles in the following regular polygons:  Pentagon Hexagon Octagon Each of the angles are marked with an x. However, each of the internal angles are the same.

Autumn 1: Week 4: Mastering this Objective – Deeper Understanding

Geometry: Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.

Teaching Sequence

- Classify triangles in terms of their properties
- Know that an equilateral triangle has three angles of 60° and three equal sides
- Know that an isosceles triangle has two sides which are equal and two angles which are equal
- Describe a right angled triangle according to its properties
- Know that angles in a triangle always total 180°
- Describe a square and a rectangle according to their properties
- Know the properties of: parallelogram, rhombus and trapezium
- Know that interior angles in a quadrilateral total 360°
- Accurately measure angles in any shape
- Accurately calculate missing angles in triangles and quadrilaterals on a line and at a point
- Sort and classify shapes according to similarities and differences

If pupils have mastered this objective they will be able to complete these activities independently:

Drawing triangles with some information

One angle of an isosceles triangle is 36°.
What could the triangle look like?
Draw it.
Are there other possibilities?

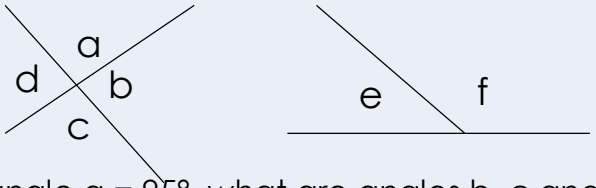
Draw a right-angled triangle that has an angle of 35°.
What could this triangle look like?
Are there other possibilities?

Triangle Puzzle

A triangle has one angle that is 20° larger than the second biggest angle and 40° larger than the smallest angle.
Work out what the three angles are.

Another triangle has one angle that is 25° bigger than the second biggest angle and 50° larger than the smallest angle.
Work out what the three angles are.

Measuring unknown angles



If angle a = 95°, what are angles b, c and d?
Explain your reasoning.
If angle e = 50° what is angle f?
Explain your reasoning.
Make up some similar questions for your friends to answer using your knowledge of angles on a straight line.

Isosceles and Parallelograms

An isosceles triangle has two angles that are the same but the third angle is 85° and the two identical sides measure 8cms.
Draw the triangle and say what the two identical angles are.

Draw a parallelogram that has two sides measuring 10cms and two angles that are 60°. What are the measurements of the other two angles and how long are the other two sides?

Autumn 1: Week 4: Working at greater depth

Geometry: Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.

Teaching Sequence

- Classify triangles in terms of their properties
- Know that an equilateral triangle has three angles of 60° and three equal sides
- Know that an isosceles triangles has two sides which are equal and two angles which are equal
- Describe a right angled triangle according to its properties
- Know that angles in a triangle always total 180°
- Describe a square and a rectangle according to their properties
- Know the properties of: parallelogram, rhombus and trapezium
- Know that interior angles in a quadrilateral total 360°
- Accurately measure angles in any shape
- Accurately calculate missing angles in triangles and quadrilaterals on a line and at a point
- Sort and classify shapes according to similarities and differences

Activities for pupils working at greater depth:

Square in a box

You will need a 10cm x 10 cm square.

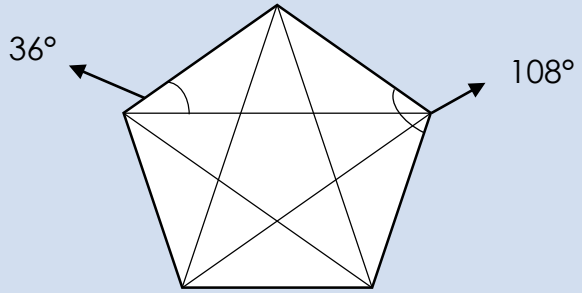
Can you draw five 3cm x 4cm rectangles and five 2cm x 5cm rectangles so that they fit exactly into the 10cm x 10cm square?

There can be no gaps and no overlapping squares.

Constructing Triangles

How would you go about drawing a triangle if you only have the measurements of the sides?
Try this one: A triangle has a base of 10cms, and two other sides which measure 8cm and 11cm.
Parallelogram
Do you have enough information to draw a parallelogram if you have the measurements of two sides and one angle: Try 10cms and 8cms angle of 45°.

Pentagon Puzzle

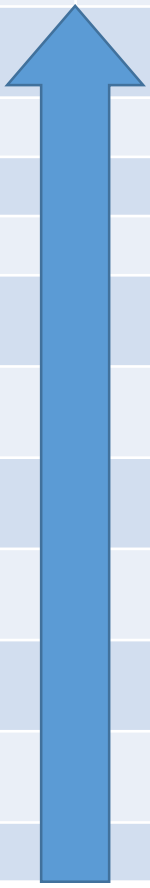


How many different isosceles triangles are there in this shape? Find each and measure the angles of each.
Paul says the smaller pentagon in the centre is exactly one third the size of the outside pentagon. Is he correct?
The 2 angles marked 36° and 108° should tell us a great deal about the other angles in this shape. Can you mark as many as you can and then check them?
Now draw a regular hexagon and octagon and put in internal lines as has been done with the pentagon.
Explore angles and triangles in both shapes.

Autumn 1: Week 4: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Geometry: Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.	Me	My Teacher
Can you work out the size of an angle in a quadrilateral by using a protractor to measure it?		
Do you know that the four angles of any quadrilateral add up to 360˚?		
Can you draw a triangle given size of sides and angle sizes?		
Can you use a protractor to measure individual angles of a triangle?		
Do you know that the total of the three angles of any triangle adds up to 180˚?		
Do you know the properties of rectangles such as parallelogram; trapezium; rhombus?		
Can you describe a square and oblong in terms of their properties?		
Can you describe a right angled triangle according to properties?		
Do you know that an isosceles triangle has two sides which are equal and two angles which are equal?		
Do you know that an equilateral triangle has three angles of 60˚ and three equal sides?		
Can you classify triangles in terms of their properties?		



Year 6: Autumn 1

Week 5: Addition & Subtraction

Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

Autumn 1: Week 5: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Autumn 1: Week 5
Objective: Addition & Subtraction	Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

If three runners run for 1000km are they likely to take: 1 minute; 5 minutes; 1 hour or 3 hours? _____		John gets £5 a week pocket money. In a year he gets approximately: £50; £100; £250; £1000 _____	
Is an adult more likely to weigh: 10Kg; 70Kg; 180KGg or 1000Kg _____		A return journey to France costs £225; the hotel bill was £335 and spending money was £160. Altogether the trip cost approximately: £500; £700; £900 £1000 _____	
How much milk are you likely to pour onto your cereals: Less than 1 litre; more than 1 litre or 5 litres? _____		A farmer sells his animals at the market. He gets £50 for his sheep and £250 for his cows. He ends up with £2500. How many sheep and cows could he have sold? _____sheep _____ cows	

Autumn 1: Week 5: Practice and Consolidation

Addition & Subtraction: Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Explain why an answer is or is not reasonable using estimation and rounding. ➢ Estimate an answer to a problem before calculating (being able to justify estimation).	• Help pupils with the concept of 'estimation' by using information wisely. • Recognise the role that 'rounding' has in estimating. • Recognise how the most valuable digit is very important when it comes to estimating. • Good estimating will depend to a large extent on the basic knowledge of individuals. • Explore the idea of alternatives as part of estimation.	A customer spends approximately £19 each week at a local shop. Estimate how much he spends in a year. How did you go about estimating? Now find out how accurate your estimation was.
		A car transporter delivers between 8 and 10 cars to a showroom every day. Approximately how many cars will the transporter deliver in a year? How did you go about estimating? Now work out the maximum number of cars that could have been delivered.
		A running club meets 3 times a week. On average each runner runs for 6.5Km each time they meet. Estimate how much a runner will have run over a year. How did you go about estimating? Now find out how accurate your estimation was.
		In a class of 30 children the average number of chocolate bars they eat each week is 95. Estimate how many bars will they eat in a year? How did you go about estimating? Now find out how accurate your estimation was.

Autumn 1: Week 5: Mastering this Objective – Deeper Understanding

Addition & Subtraction: Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

Teaching Sequence

- Explain why an answer is or is not reasonable using estimation and rounding.
- Estimate an answer to a problem before calculating (being able to justify estimation).

If pupils have mastered this objective they will be able to complete these activities independently:

Tom is keen to move to a new house. He is trying to work out if he can afford to buy one of 3 houses. He works out what his monthly spending would be:

Spending	House 1	House 2	House 3
Mortgage	700	800	900
Council Tax	50	60	70
Energy	120	130	140
Food	260	260	260
Clothes	50	50	50
Savings	150	150	150
Car and Petrol	180	180	180
Leisure	100	100	100

He earns £1,600 (after tax and other deductions) each month.
Is he able to afford to move to House 1, 2 or 3?
Estimate his spending and work out whether he has enough money.

Ramesh has a birthday party coming up. He wants a birthday party and his parents tell him he will have a budget of £300 in total for the party.
Ramesh has four ideas but has many friends.
He finds out how much each of his ideas would cost per person:

A	B	C	D
Football Match	Bowling	Skating	Seaside Visit
£31.99	£17.99	£23.99	£28.99

Ramesh has 24 friends and he and his parents would have to come as well.
How many friends can Ramesh invite to each option?
Estimate in the first instance.
Explain how you did your estimation.
Work out the actual costs.

Autumn 1: Week 5: Working at greater depth

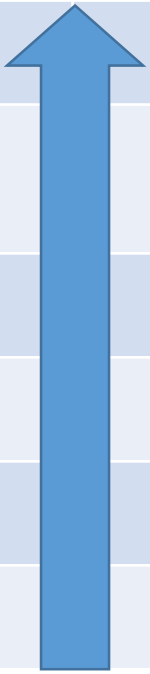
Addition & Subtraction: Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

Teaching Sequence	Activities for pupils working at greater depth:	
➢ Explain why an answer is or is not reasonable using estimation and rounding. ➢ Estimate an answer to a problem before calculating (being able to justify estimation).	**Farming Decision** A farmer has a spare field. He has to make a decision whether to keep sheep, cows or hens in the spare field. He could keep up to 10 cows. Each cow produces 20 litres of milk a week which he can sell at 50p per litre. He could keep 25 sheep who produce 10Kg of wool each per year. He can sell the wool for £5 a Kg. He could keep 250 hens who would produce a 1000 eggs each week. He could sell the eggs at 10p each. However, it would cost £250 extra a year to keep the cows; £100 extra a year to keep the sheep and only £10 extra a year to keep the hens. First estimate how much money each animal would make and take away the extra cost. Then work out which would be the best option for the farmer. Create a similar farmer problem for your friends to solve.	**Summer Fayre** Children in Class 7 want to raise money for the school and want to run a stall at the summer fayre. They come up with 3 different ideas: **Option A** Bake cup cakes; every 10 cakes will cost £1 to make but they can sell them for 20p each. **Option B** Collect in old toys and books and sell them at 25p each **Option C** Have a 'Guess the name of the Teddy' stall and sell tickets at 10p each. First estimate how many cakes; toys or tickets need to be sold to make £100 profit. Explain your estimation. Now work out how accurate you were. Discuss which would be the best option in reality. Talk about the ideas and how good they are. Could you come up with a better idea?

Autumn 1: Week 5: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Addition & Subtraction: Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.	Me	My Teacher
Can you explain the reasoning behind your estimating?		
Do you appreciate that whilst estimating is a good first option for an approximation checking out remains important?		
Do you appreciate when it would be a good idea to estimate and make decisions based on that estimation?		
Can you use rounding when it is appropriate to do so?		
Can you think of different situations when estimating would be sensible?		
Can you appreciate why estimating can sometimes be a good option?		



Year 6: Autumn 1

Week 6: Multiplication & Division

Perform mental calculations, including mixed numbers and large numbers.

Autumn 1: Week 6: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Autumn 1: Week 6
Objective: Multiplication & Division	Perform mental calculations, including mixed numbers and large numbers.

Work these out as rapidly as you can and time yourself

3473 x 10			650 x 4		
2789 x 100			900 ÷ 3		
Find half of 2500			1200 ÷ 30		
Find a quarter of 2800			5000 ÷ 25		
2.5 x 2000			7500 ÷ 75		
2.25 x 100			2.3 x 8		
5000 ÷ 20			8.7 x 7		
10500 ÷ 5			11.6 x 9		

Autumn 1: Week 6: Practice and Consolidation

Multiplication & Division: Perform mental calculations, including mixed numbers and large numbers.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Use a range of numbers to multiply and divide.	• The main aim of this unit is to increase pupils' range of mental agility to include mixed numbers and larger numbers. • They should be able to refer back to their knowledge of the times tables when tackling these problems. • The unit also needs to include aspects of logical thinking so that they are exercising their thinking as well as reasoning. • During this unit pupils should be able to respond rapidly to a number of more complex questions.	Chocolate bars cost 26p and Fruit Bars cost 18p Hannah spent exactly £5 on a mixture of chocolate and fruit bars. How many of each did she 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?
		Ellie owes Poppy £27. Malachy owes Ellie £13 and Juan owes Ellie £35. How much will Ellie have when everyone has paid what they owe? Ellie is saving for a computer game that costs £68.70 How much more money does she need?
		What needs to be added to 6.543 to make 7? What needs to be added to 3.582 to make 5? What needs to be added to 7.324 to make 10? What needs to be added to 3.912 to make 5?

Autumn 1: Week 6: Mastering this Objective – Deeper Understanding

Multiplication & Division: Perform mental calculations, including mixed numbers and large numbers.

Teaching Sequence	If pupils have mastered this objective they will be able to complete these activities independently:	
➢ Use a range of numbers to multiply and divide.	**Coach Journey** A 50-seater coach travels to the match. Most of the seats are taken. Junior tickets cost £13 and Adult tickets cost £23. The only people on the coach are juniors and adults. The total amount paid for tickets is approximately £900. How many people on the coach were adults and how many were juniors?	**Baking Fun** A recipe needs to include three times as much apple to peach. The total weight of apples and peaches in a recipe is 800 grams. How much apple do you need? Pancakes need to have four times as much flour to egg. If you make up a mixture of 1Kg, how many grams of flour will you have?
	Sophie's Numbers Sophie thinks of a number. She divides it by 2, then she adds 98 and her answer is 100. What was the number Sophie though of? How did you calculate this? Can you write your own version of this question for a friend?	**Eggstrodinary** Farmer Cynthia spent exactly £10 on 100 eggs. There were 3 sizes of eggs: Large; Medium and Small. Large eggs cost 50p; Medium eggs cost 10p and Small eggs cost 5p. For 2 of the sizes, she bought the same number of eggs. How many of each size did she buy?

Autumn 1: Week 6: Working at greater depth

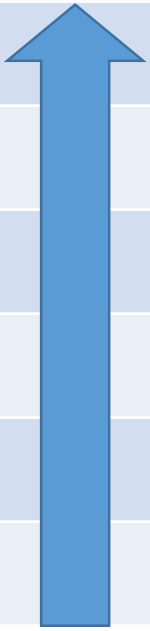
Multiplication & Division: Perform mental calculations, including mixed numbers and large numbers.

Teaching Sequence	Activities for pupils working at greater depth:
➢ Use a range of numbers to multiply and divide.	**How much money** Connor has 45p. If James had 12p more he would have the same as George. If Connor spent one third of his money he would also have the same as George. How much does James have?
	Guess the Weight of the Pig Jamie and Lauren had a go at the 'Guess the weight of the pig' competition at a village fayre. The pig weighed 99kg but Jamie had guessed too high and Lauren had guessed too low. "The pig weighed 10% higher than my guess, so I was close" said Lauren. "It's 10% lower than my guess, so I was just as close as you," said Jamie. What weights did Jamie and Lauren guess? Is it true that both guesses were equally close to the real weight?
	Nuts and Bolts 8 bolts and 6 nuts weigh 138 grams. 3 bolts and 5 nuts weigh 71 grams. Can you calculate the weight of: • 1 bolt • 4 bolts and 3 nuts • 11 bolts and 11 nuts • 3 bolts and 3 nuts 
	Lottery Win • Harry won the lottery. • He spent two-thirds of his winnings on a very posh house. • He spent two-thirds of what he had left on a luxury yacht. • He then spent two-thirds of what he had left on a hot air balloon. • He spent the rest of his winnings, £20,000 on a sports car. • How much did Harry win on the lottery?

Autumn 1: Week 6: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Multiplication & Division: Perform mental calculations, including mixed numbers and large numbers.	Me	My Teacher
Can you respond logically to problems that are presented to you?		
Can you quickly get your head around a reasoning and thinking style problem?		
Can you multiply or divide when halves or quarters are involved?		
Can you double and halve large numbers?		
Can you recognise multiples of 10 from an original times table fact, eg, 6 x7 = 42; 6 x70 = 420?		
Can you recall rapidly all the number facts associated with the times tables to x12?		



YEAR 6 : AUTUMN 2: Overview and Teaching Steps

WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
1 Fractions	**2 Fractions Percentages**	**2 Geometry**	**1 Measures**	**2 Measures**	**Consolidate and Assess**
Compare and order fractions, including fractions >1. Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.	Recall and use equivalences between simple fractions, decimals and percentages, including different contexts	Draw 2D shapes using given dimensions and angles.	-Calculate, estimate and compare volume of cubes and cuboids using standard units, including cm^3 and m^3, and extending to other units such as mm^3 and km^3. -Convert between miles & km.	Use, read, 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 three decimal places.	Start this week by revising the learning covered in the Autumn term so as to ensure pupils are fluent and secure with their basic skills. Use a simple assessment process to check on pupils' confidence and consistency in using the learning outlined in the Autumn term. Analyse the results and use information to help focus the intervention sessions, as needed, for the following term.
➢ Order fractions in ascending and descending order. ➢ Simplify fractions	➢ Revise that 1/10 can be represented as 0.1 and use this to solve problems. ➢ Revise that ¼, ¾ can be represented as 0.25 or 0.75 and use this to solve problems. ➢ Revise all the decimal equivalent fractional values where the denominator is 3, 4, 5, 6, 8 or 10 and use to solve problems. ➢ Link this to percentages so that pupils can move between equivalent fractions, decimals and percentages	➢ Draw a square accurately having been given the length of a side ➢ Draw a rectangle accurately having been given the length and breadth ➢ Draw an equilateral triangle accurately having been given the length of a side ➢ Draw an isosceles triangle accurately having been given the length of the base ➢ Draw a triangle to a given set of angles and sides ➢ Draw pentagons and hexagons to given criteria	➢ Estimate volume of shapes and check for accuracy ➢ Know the formula for converting m:km ➢ Use the formula to calculate distances ➢ Use a conversion graph	➢ Use, add and subtract positive and negative integers for measures such as temperature and money ➢ Convert large numbers of cm into m; ml into l; g into kg; minutes into hours	

Year 6: Autumn 2

Week 1: Fractions

Compare and order fractions, including fractions >1. Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.

Autumn 2: Week 1: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Autumn 2: Week 1
Objective: Fractions	Compare and order fractions, including fractions >1. Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.

Circle the largest fraction			***Simplify these fractions***		
$\frac{1}{2}$	$\frac{6}{10}$	$\frac{3}{4}$	$\frac{4}{12}$		
$\frac{2}{3}$	$\frac{2}{5}$	$\frac{2}{7}$	$\frac{8}{16}$		
$\frac{2}{3}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{7}{21}$		
$1\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{7}{8}$	$\frac{8}{24}$		
$\frac{7}{12}$	$\frac{9}{12}$	$\frac{5}{12}$	$\frac{24}{16}$		
$2\frac{6}{7}$	$2\frac{2}{7}$	$2\frac{5}{7}$	$\frac{20}{25}$		

Autumn 2: Week 1: Practice and Consolidation

Fractions: Compare and order fractions, including fractions >1. Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Order fractions in ascending and descending order. ➢ Simplify fractions	• This unit is about moving on pupils' understanding about fractions. • Help pupils to recognise that when the denominator is a multiple of a smaller number it often can be simplified. • Start by using examples such as ½ and 2/4th. Show them on a metre rule and emphasise how they are the same value. • After the practical example, move on to show how to simplify fractions by dividing the denominator and the numerator by the same number. • In this way it is easier to see their value in relation to each other.	Simplify the following fractions: $\frac{4}{8}$ $\frac{8}{12}$ $\frac{6}{18}$ $\frac{12}{20}$ $\frac{16}{24}$ $\frac{24}{28}$ $\frac{15}{25}$ Now simplify these mixed fractions: $\frac{28}{8}$ $\frac{46}{10}$ $\frac{62}{12}$ $\frac{66}{10}$ $\frac{74}{8}$ $\frac{49}{7}$ $\frac{50}{12}$ Order the following sets of fractions (lowest first): $\frac{23}{8}$ $\frac{35}{4}$ $\frac{19}{16}$ $\frac{35}{8}$ $\frac{67}{10}$ $\frac{23}{5}$ $\frac{98}{20}$ $\frac{35}{5}$ Turn the following fractions into improper fractions: $5\frac{6}{7}$ $4\frac{2}{3}$ $8\frac{1}{4}$ $9\frac{3}{8}$ $7\frac{3}{5}$ $5\frac{1}{10}$

Autumn 2: Week 1: Mastering this Objective – Deeper Understanding

Fractions: Compare and order fractions, including fractions >1. Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.

Teaching Sequence

- Order fractions in ascending and descending order.
- Simplify fractions

If pupils have mastered this objective they will be able to complete these activities independently:

Put a number in the box that represents the denominator or the numerator so that the number sentence is true:

$\frac{2}{3} = \frac{6}{\square}$ $\quad \frac{3}{4} = \frac{\square}{8}$

$\frac{\square}{8} = \frac{\square}{4}$ $\quad \frac{1}{\square} = \frac{3}{\square}$

Which is the odd one out in each of these collections of 4 fractions?

3/4	9/12	26/36	18/24
4/20	1/5	6/25	6/30
4/5	16/20	28/35	8/12
2/7	4/8	6/21	10/35

Put these sets in order, starting with the largest.

23%	5/8	3/5	0.8
16%	1/6	3/21	0.2
23%	1/5	3/20	0.3
17%	1/5	2/7	0.3
67%	2/3	4/7	0.6

Write one and a half as an improper fraction.

Write two-thirds as two other fractions with different denominators and numerators.

Write thirty-two over ten as a mixed fraction.

Write forty-nine over four as a mixed fraction.

Write five and a quarter as an improper fraction.

Autumn 2: Week 1: Working at greater depth

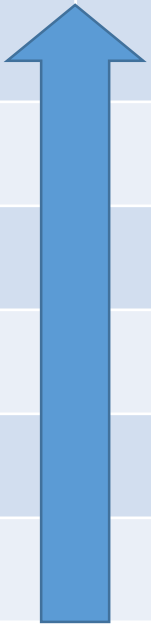
Fractions: Compare and order fractions, including fractions >1. Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.

Teaching Sequence	Activities for pupils working at greater depth:	
➢ Order fractions in ascending and descending order. ➢ Simplify fractions	**Pocket Money** Gilly gets £2.50 pocket money. James has one fifth more than Gilly. If Henry spent half of his pocket money he would have the same as James. How much pocket money does each have? Make up some similar problems for your friends to solve.	**Order of Fractions** The numbers ⅛ , x, y, ⅞ are in increasing order of size. The difference between successive numbers in this list are all the same. What is the value of x and y? What is x + y ? Make up some similar problems for your friends to solve.
	Greater and Smaller Your parents offer you pocket money. They give you the choice of having ⅛ of £48 or ¼ of £40 each week. Which option would you go for and why? The following year they offer you ⅞ of £24 or 1/5th of £100. Which option would you choose and why?	⅜ of your savings is £24, how much savings do you have? 2/9th of your bank account is £80, how much is there in your bank account? 5/6th of the distance you ran was 480m. How far did you run? ¾ of the strawberries weigh 16Kg, how much does all the strawberries weigh?

Autumn 2: Week 1: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Fractions: Compare and order fractions, including fractions >1. Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.	Me	My Teacher
Can you find the fractional value of a given amount of money, length, mass or capacity?		
Can you change an improper fraction into a mixed fraction?		
Can you order fractions so that the lowest fraction comes first?		
Can you compare fractions by rewriting them so that they have the same denominator?		
When it is possible, can you simplify a fraction to its lowest form?		
Do you recognise ½, ¼ and ¾ in other fractional forms?		



Year 6: Autumn 2

Week 2: Fractions: Percentages

Recall and use equivalences between simple fractions, decimals and percentages, including different contexts

Autumn 2: Week 2: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Autumn 2: Week 2
Objective: Fractions	**Percentages:** Recall and use equivalences between simple fractions, decimals and percentages, including different contexts

Write the following fractions as decimals:			**Write the following fractions or decimals as percentages:**		
$\frac{4}{5}$			$\frac{1}{4}$		
$\frac{7}{10}$			0.23		
Write the following decimals as fractions (in their lowest form):			$\frac{7}{10}$		
0.2			0.16		
0.25			$\frac{3}{4}$		
0.75			0.25		
0.8			0.92		

Autumn 2: Week 2: Practice and Consolidation

Fractions: Percentages: Recall and use equivalences between simple fractions, decimals and percentages, including different contexts

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Revise that 1/10 can be represented as 0.1 and use this to solve problems. ➢ Revise that ¼, ¾ can be represented as 0.25 or 0.75 and use this to solve problems. ➢ Revise all the decimal equivalent fractional values where the denominator is 3, 4, 5, 6, 8 or 10 and use to solve problems. ➢ Link this to percentages so that pupils can move between equivalent fractions, decimals and percentages	• Revise the equivalence between decimals and fractions. • Chant counting in tenths in both decimal and fractional forms. • Ensure pupils are confident in knowing that 50% is the same as ½ and 0.5. • Similarly, that ¼ is the same as 0.25 and 25%. • Focus on the common fractions with denominators of 3, 4, 5, 6, 8 and 10. • Provide pupils with simple problems related to percentages.	Write the following as fractions (in their lowest forms) 0.25 0.3 0.7 0.75 0.4 0.6 0.15 0.85 0.72 Write these fractions as decimals and as percentages: $\frac{2}{5}$ $\frac{5}{8}$ $\frac{7}{8}$ $\frac{1}{3}$ $\frac{4}{5}$ $\frac{9}{10}$ $\frac{3}{4}$ $\frac{3}{5}$ $\frac{1}{5}$ Write the following percentages as fractions (to their lowest form): 25% 75% 60% 70% 80% 16% 90% 55% 65% Solve these problems: Find 50% of £40. Find 40% of £50. Find 60% of 200gms Find 90% of £300 Find 10% of £50 Find 70% of £120 Find 65% of 400m. Find 45% of 200 litres Find 15% of 400gms Find 45% of 800Km

Autumn 2: Week 2: Mastering this Objective – Deeper Understanding

Fractions: Percentages: Recall and use equivalences between simple fractions, decimals and percentages, including different contexts

Teaching Sequence

- Revise that 1/10 can be represented as 0.1 and use this to solve problems.
- Revise that ¼, ¾ can be represented as 0.25 or 0.75 and use this to solve problems.
- Revise all the decimal equivalent fractional values where the denominator is 3, 4, 5, 6, 8 or 10 and use to solve problems.
- Link this to percentages so that pupils can move between equivalent fractions, decimals and percentages

If pupils have mastered this objective they will be able to complete these activities independently:

Give an example of a **fraction** that is greater than 1.1 but less than 1.5.

Give an example of a **decimal** that is more than ¾ but less than ⅞.

Give an example of a **percentage** that is more than 2/3 but less than ¾.

Give an example of a **fraction** that is more than 2.3 but less than 2.5.

Circle the two decimals which are closest in value to each other.

0.9	0.09	0.99	0.1	0.01
0.1	0.09	0.5	0.35	0.23
0.2	0.08	0.15	0.11	0.19
1.23	1.27	1.29	1.3	1.35

True or False

- 25% of 23km is longer than 0.2 of 20km
- 20% of 4Km is longer than ⅞ of 4Km
- 30% of 6Kg is heavier than 0.2 of 8Kg
- 50% of 15Kg is heavier than 0.25 of 8Kg
- 25% of £16 is more than 0.3 of £15
- 75% of £500 is more than 0.7 of £600
- 18% of £300 is more than 0.2 of £400

Complete the following:

Decimal	Fraction	%
0.3		
	⅞	
		45
0.12		
	⅜	

Autumn 2: Week 2: Working at greater depth

Fractions: Percentages: Recall and use equivalences between simple fractions, decimals and percentages, including different contexts

Teaching Sequence

- Revise that 1/10 can be represented as 0.1 and use this to solve problems.
- Revise that ¼, ¾ can be represented as 0.25 or 0.75 and use this to solve problems.
- Revise all the decimal equivalent fractional values where the denominator is 3, 4, 5, 6, 8 or 10 and use to solve problems.
- Link this to percentages so that pupils can move between equivalent fractions, decimals and percentages

Activities for pupils working at greater depth:

Blood in the Human Body

The human body contains 5 litres of blood. 45% of blood is made up of blood cells and 55% is made up of plasma.
Work out the volume of blood cells and plasma we have.

On average, the heart beats 72 times in one minute.
When exercising the heart beats 50% faster and when sleeping the heart beats 25% slower.

How many beats will the heart make if you exercise for 90 minutes and how many beats will it make if you are asleep for 6 hours?

If it takes approximately ½ a minute for the 5 litres of blood to travel around your body, how much blood will have travelled around your body in 1 day?

Did I spend that much time?

As a Year 6 pupil you will have done many things over and over again in school. The table below gives you a percentage overview of some of these.

Activity	%
Break	16
Lining Up	1
Reading	5
Assembly	2
PE	3
Maths	20
English	25

If every school year has 40 weeks and every school day has 360 minutes and you will have been in school for 7 years (Reception to Year 6), work out the following:

How many minutes have you spent lining up?
How many more minutes, every year, will you have spent reading than doing PE?
How many minutes will you have spent doing Maths and English?
How many more minutes did you spend at break rather than assembly?

Autumn 2: Week 2: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Fractions: Percentages: Recall and use equivalences between simple fractions, decimals and percentages, including different contexts	Me	My Teacher
Can you find the percentage of a given amount?		
Can you work out what the percentage of a given fraction or decimal fraction is?		
Do you remember and understand the term 'percent'?		
Can you represent fractions with denominators of 2, 3, 4, 5, 6, 8 or 10 as decimal fractions?		
Can you solve problems by finding 0.1, 0.25, 0.5 and 0.75 of given amounts?		
Do you remember that ¼, ½ and ¾ can be represented as 0.25, 0.5 and 0.75 respectively?		
Do you remember that 1/10 can be represented as 0.1?		

Year 6: Autumn 2

Week 3: Geometry

Draw 2D shapes using given dimensions and angles.

Autumn 2: Week 3: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Autumn 2: Week 3
Objective: Geometry	Draw 2D shapes using given dimensions and angles.

Draw a square with a side of 5cm.		Draw an equilateral triangle with side of 6cm	
Draw a rectangle with one pair of sides of 10cm and the other pair 6cm.		Draw an isosceles triangle with a base of 5cm and 2 angles of 70°.	

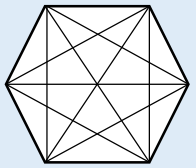
Autumn 2: Week 3: Practice and Consolidation

Geometry: Draw 2D shapes using given dimensions and angles.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Draw a square accurately having been given the length of a side ➢ Draw a rectangle accurately having been given the length and breadth ➢ Draw an equilateral triangle accurately having been given the length of a side ➢ Draw an isosceles triangle accurately having been given the length of the base ➢ Draw a triangle to a given set of angles and sides ➢ Draw pentagons and hexagons to given criteria	• Remind pupils about using a protractor. • Remind pupils of the need for accuracy. • A quick reminder about the use of rulers will probably be needed also. • Focus on regular polygons such as pentagons; hexagons and octagons and ensure pupils are aware of the angles formed by these regular polygons.	Draw 5 squares with the following sides: 5cm 7cm 10cm 12cm 15cm Knowing what you know about area and perimeter; What is the difference between the area and perimeter of the smallest and largest square? Draw 5 right-angled triangles which have two angles set of 45° and two sides of the following lengths: 5cm 7cm 10cm 12cm 15cm Knowing what you know about area and perimeter; what is the difference between the area and perimeter of smallest and largest right-angled triangles? Find a regular hexagon; pentagon and octagon. Find the internal angle that joins two sides on each of the polygons. If the pentagon has 5 internal angles; the hexagon has 6 and the octagon has 8. What is the sum of the internal angles of a pentagon; hexagon and octagon? Does this apply to irregular pentagons; hexagons and octagons?

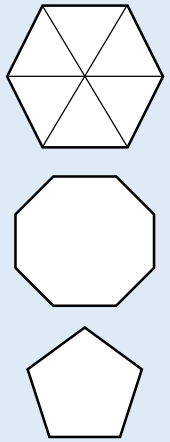
Autumn 2: Week 3: Mastering this Objective – Deeper Understanding

Geometry: Draw 2D shapes using given dimensions and angles.

Teaching Sequence	If pupils have mastered this objective they will be able to complete these activities independently:	
➢ Draw a square accurately having been given the length of a side ➢ Draw a rectangle accurately having been given the length and breadth ➢ Draw an equilateral triangle accurately having been given the length of a side ➢ Draw an isosceles triangle accurately having been given the length of the base ➢ Draw a triangle to a given set of angles and sides ➢ Draw pentagons and hexagons to given criteria	If one angle of an isosceles triangle is 45°; what could the triangle look like? Draw it. Are there other possibilities? Now draw an equilateral triangle where the sides of the first is half the sides of the other. What is similar and what is different? Draw two right-angled triangles which look very different.	**Always, Sometimes or Never** Is it always, sometimes or never true that, two of the angles of an isosceles triangle measure 45°? Is it always, sometimes or never true that the area of a right-angled triangle is half the area of the product of its two sides?
	Drawing Triangles and Rectangles • Draw a triangle that has one angle of 65°; one of 35° and two sides of 6cm and 7cm. • Draw a triangle that has the following sides: 8cm; 10cm; and 6cm (you will need a compass for this). • Draw a rectangle with a pair of sides 8cm, and another pair of 5cms. • Draw an equilateral triangle with a side of 10cm. • Draw an isosceles triangle with two angles of 75° and two sides of 10cm.	Draw around a regular pentagon; hexagon and octagon. Join as many internal points as you can, eg  The hexagon has been done for you. How many triangles can you count? How many other shapes can you see? Name them. Now do the same with the pentagon and octagon.

Autumn 2: Week 3: Working at greater depth

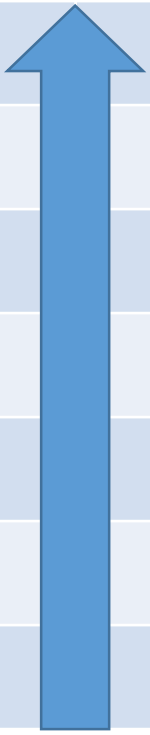
Geometry: Draw 2D shapes using given dimensions and angles.

Teaching Sequence	Activities for pupils working at greater depth:	
➢ Draw a square accurately having been given the length of a side ➢ Draw a rectangle accurately having been given the length and breadth ➢ Draw an equilateral triangle accurately having been given the length of a side ➢ Draw an isosceles triangle accurately having been given the length of the base ➢ Draw a triangle to a given set of angles and sides ➢ Draw pentagons and hexagons to given criteria	**Rectangles and Triangles** Draw a rectangle 10cm x 8cm. Now draw a right-angled triangle that has a side of 8cm and another side of 2cm. How many triangles can you fit perfectly into the rectangle? What does this tell you about the area of each of the triangles? If the rectangle had been 20cm x 12cm, what size would my right-angled triangle need to be to fit exactly into this rectangle?	**Pentagon** Start by constructing a regular pentagon with sides of 10cm. Join each of the sides up so that you have a star shape with a central smaller regular pentagon. What is the length of the side of this new, smaller pentagon? If you then joined the sides of this new, smaller pentagon and measure the side, can you see a pattern emerging?
	Triangle, Triangle, Triangle Draw an equilateral triangle with sides of 8cm. Draw an isosceles triangle with a base of 5cm and two sides of 8cm. Draw a right-angled triangle with a base of 8cm and another side of 8cm. How would you go about finding out the area of each of these triangles? Explain your methods and get your friend to check your accuracy.	 Draw a line from the corner of the regular hexagon to the centre. You form 6 triangles. What do you know about each of these triangles? Can you work out what the sum of the internal angles at each point is for a hexagon? Repeat this for a hexagon and ask the same questions. Repeat this for a pentagon and ask the same questions.

Autumn 2: Week 3: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Geometry: Draw 2D shapes using given dimensions and angles.	Me	My Teacher
Can you draw a regular pentagon; hexagon and octagon?		
Can you draw any triangles once provided with the length of the sides or angles or a combination of sides and angles?		
Can you draw a right-angled triangle accurately once provided with the length of the side and one angles?		
Can you draw an isosceles triangle accurately once provided with the length of the side and angles?		
Can you draw an equilateral triangle accurately once provided with the length of the side?		
Can you draw a rectangle accurately once provided with the lengths of the pair of sides?		
Can you draw a square accurately once provided with the length of the side?		



Year 6: Autumn 2

Week 4: Measures

-Calculate, estimate and compare volume of cubes and cuboids using standard units, including cm^3 and m^3, and extending to other units such as mm^3 and km^3.
-Convert between miles & km.

Autumn 2: Week 4: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Autumn 2: Week 4
Objective: Measures	-Calculate, estimate and compare volume of cubes and cuboids using standard units, including cm^3 and m^3, and extending to other units such as mm^3 and km^3. -Convert between miles & km.

What does the symbol (^{3}) stand for?			There are approximately 8Km in every 5 miles. How many Km are there in 25 miles?		
What is the volume of a cube with a side of 6cms.?					
What is the volume of a cuboid with sides of 8cm x 6cm x 3cm?					
A large container is unloaded from a ship. It measures 5m x 4m x 3m. What is its volume?					

Autumn 2: Week 4: Practice and Consolidation

Measures: -Calculate, estimate and compare volume of cubes and cuboids using standard units, including cm^3 and m^3, and extending to other units such as mm^3 and km^3.
-Convert between miles & km.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Estimate volume of shapes and check for accuracy ➢ Know the formula for converting m:km ➢ Use the formula to calculate distances ➢ Use a conversion graph	• Remind pupils of the symbol (^{3}) for cubed. • When finding the volume you effectively multiply **l x b x w** • Emphasise that this remains the same no matter what the size is. • There are very precise systems in place for converting between miles and Km. • However, there are also two very good approximate examples which work very well.	• A chocolate box measures 20cm x 10cm x 4cm. What is the volume of the chocolate box? • A carpenter's tool box measures 45cm x 20cm x 15cm. What is the volume of the carpenter's tool box? • A removal firm has 2 lots of boxes. They measure as shown below: 4m x 2m x 2m 6.5m x 5m x 3m What is the volume of each of the two boxes? **Converting Miles to Km** If you divide the number of miles by 5 and then multiply your answer by 8. In other words (X ÷ 5) x 8. Use this method to convert the following miles to Km 45miles 60 miles 120 miles 25 miles 80 miles 65 miles **Converting Km to miles** You take the kilometre number, 144, and halve it; 72. Then take a quarter of your half, 18, and just add the two together. 72 + 18 = 90. **That's your answer in miles**. Use this method to convert the following Km to miles: 40Km 64Km 120Km 400Km 160Km 240Km 80Km

Autumn 2: Week 4: Mastering this Objective – Deeper Understanding

Measures: -Calculate, estimate and compare volume of cubes and cuboids using standard units, including cm^3 and m^3, and extending to other units such as mm^3 and km^3.
-Convert between miles & km.

Teaching Sequence

- Estimate volume of shapes and check for accuracy
- Know the formula for converting m:km
- Use the formula to calculate distances
- Use a conversion graph

If pupils have mastered this objective they will be able to complete these activities independently:

A block of flats has the following dimensions:
15m x 12m x 25m
What is the volume of the space occupied by the block of flats?

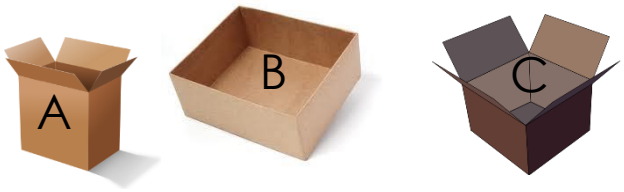
There are 9 floors in the block of flats. What is the volume of each floor?

Chocolate box

Bars of chocolate arrive in boxes.
The dimensions for the large box are 60cm x 30cm x 10cm.

Each chocolate bar measures 10cm x 5cm x 1cm.

What is the maximum number of bars of chocolate that can fit into the larger box?



These 3 boxes have the following dimensions (all in cm):
A 20 x 10 x 45 B 10 x 11 x 26
C 25 x 25 x 12
Which box has the greatest volume?

Use a quick method and the accurate method to convert these Miles to Km
Accurate method: 1 mile = 1.60934Km
Approximate method: (X miles ÷ 5) x 8.

205 miles	75 miles
125 miles	105 miles
35 miles	95 miles
80 miles	175 miles

What is the difference in Km between the two measures?

Autumn 2: Week 4: Working at greater depth

Measures: -Calculate, estimate and compare volume of cubes and cuboids using standard units, including cm^3 and m^3, and extending to other units such as mm^3 and km^3.
-Convert between miles & km.

Teaching Sequence	Activities for pupils working at greater depth:	
➢ Estimate volume of shapes and check for accuracy ➢ Know the formula for converting m:km ➢ Use the formula to calculate distances ➢ Use a conversion graph	**Gold Bar Extravaganza** A large box holds gold bars. The box has the following dimensions 5m x 3m x 2m. Each bar of gold is 30cm x 10cm x 5cm. What is the maximum number of bars that will fit into the large box? Explain your reasoning.	**Hotel Design** A large hotel has 16 floors. Each floor has the following dimensions: 25m x 20m x 3m. What is volume of the whole building? The designers want to fit five rooms in each floor. Design one of the floors. Make sure that there is enough space in each room and that there is corridor which enables access to each room. Rooms can be of different size.
	Taxi Mix-up A man notices that a taxi firm has 2 sets of fairs. The first is measured in Km and the second in miles. The two prices are as follows: 25p for 5 Km or 25p for 3 miles. The man wants to go on a 80Km or 50 mile trip. What is the difference in taxi firm's prices?	**House extension** A builder charges for an extension by m^3. He charges £250 per m^3. The first family want an extension which measures 5m x 4m x 3m; The second family want an extension which measures 8m x 4m x 3m; The third family want an extension which measures 12m x 4m x 3m Which family will pay most and by how much?

Year 6: Autumn 2

Week 5: Measures

Use, read, 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 three decimal places.

Autumn 2: Week 5: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Autumn 2: Week 5
Objective: Measures	Use, read, 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 three decimal places.

How many seconds in 23 minutes?			Three children weigh 85Kg between them. The first weighs 23Kg, the second 32Kg. How many grams does the third weigh?		
Write 3290 seconds as minutes and seconds.					
Write 3490 grams as Kg and grams.			On three consecutive days, Ryan runs 4.7Km; 5.3Km and 4.8Km. How many metres did he run?		
How many hours in 4 days and 10 hours?					
How many metres in 7.4 Km?			How many minutes have passed between 2.35am and 4.15 am?		
How many cm in 6.7 metres?					

Autumn 2: Week 5: Practice and Consolidation

Measures: Use, read, 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 three decimal places.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Use, add and subtract positive and negative integers for measures such as temperature and money ➢ Convert large numbers of cm into m; ml into l; g into kg; minutes into hours	• This is a unit which aims to improve pupils' ability to convert between standard units. • This will include length; weight; volume; time and temperature.	Here are the recorded high and low temperatures for each month last year. What is the difference between the highest recorded and lowest recorded temperature through the year? Look at the winter months of Dec; Jan and Feb: What is the difference between the highest winter temperature and the lowest winter temperature? Convert the following weight to grams: 2.34Kg; 5.67Kg; 8.28Kg Convert the following length to metres: 1.76Km; 2.34Km; 3.35Km Convert the following time to seconds: 1hour and 34 minutes

Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
-8	-12	-5	-3	2	7	9	12	10	5	-2	-6
1	3	10	16	19	21	26	28	22	19	10	2

Autumn 2: Week 5: Mastering this Objective – Deeper Understanding

Measures: Use, read, 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 three decimal places.

Teaching Sequence	If pupils have mastered this objective they will be able to complete these activities independently:	
➢ Use, add and subtract positive and negative integers for measures such as temperature and money ➢ Convert large numbers of cm into m; ml into l; g into kg; minutes into hours	A train left Chesterfield at 10.35am and arrives in Carlisle at 1.05 pm. In minutes, how long did the journey take? A train left Manchester at 11.55am and arrives in London at 2.15 pm. In minutes, how long did the journey take? A train left Edinburgh at 8.35am and arrives in Inverness at 2.05 pm. In minutes, how long did the journey take?	The distance between London and Manchester is 380Km. Two people travel by coach and each get charged £4.75 per 10Km; Two others travel by train and pay £134 each for their tickets. Two others travel by car and pay 95p per litre of fuel used. The car travels 20Km for every litre used. Work out who gets between London and Manchester the cheapest and who pays the most?
	Chen, Megan and Sam have parcels. Megan's parcel weighs 1.2kg, Chen's parcel is 1500g and Sam's parcel is half the weight of Megan's parcel. How much heavier is Megan's parcel than Chen's parcel? Write down some other questions to ask about the parcels.	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.
		A film lasting 200 minutes finished at 17:45. At what time did it start? A film lasting 200 minutes finished at 16:25. At what time did it start?

Autumn 2: Week 5: Working at greater depth

Measures: Use, read, 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 three decimal places.

Teaching Sequence

- Use, add and subtract positive and negative integers for measures such as temperature and money
- Convert large numbers of cm into m; ml into l; g into kg; minutes into hours

Activities for pupils working at greater depth:

Filling the car

At the petrol station the price of fuel is 91.3p per litre.
A car is filled with 88 litres of fuel. Will £50 be enough to pay for the fuel?
Estimate in the first place giving a reason for your answer and then find out exactly how much was spent at the petrol station.

What if the price of fuel increased by 7.4p per litre. Would £100 be enough to fill the car with 88 litres?

Millennium Date

If you take the beginning of the millennium as your starting point, work out the following:
At what time of day of what year will it be:

- 2000 seconds after the start of the Millennium?
- 2000 minutes after the start of the Millennium?
- 2000 hours after the start of the Millennium?
- 2000 days after the start of the Millennium?
- 2000 weeks after the start of the Millennium?

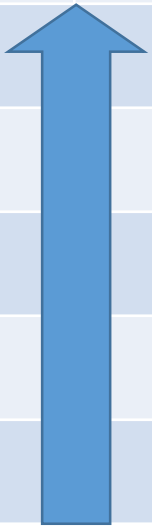
An electronic toy robot uses 1,500 hours' worth of battery time per year. There are 3 types of batteries that can be bought. Using the table below, work out which battery provides best value for money for powering the robot.

	Battery Type A	Battery Type B	Battery Type C
Lifespan (in hours)	25 hours	30 hours	50 hours
Cost	£12.50	£16.75	£21.30

Autumn 2: Week 5: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Measures: Use, read, 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 three decimal places.	Me	My Teacher
Can you convert between any measurement of time?		
Can you convert between smaller units of measure and larger ones for length; mass and volume?		
Do you recognise that measuring temperature in centigrade often involves negative numbers?		
Do you know that there are 60 seconds in each minute and 60 minutes in an hour?		
Do you know how many ml make a litre; grams in a Kg; metres in a Km and centimetres in a metre?		



Year 6: Autumn 2

Week 6: Consolidate and Assess

- Start this week by revising the learning covered in the Autumn term so as to ensure pupils are fluent and secure with their basic skills.
- Use a simple assessment process to check on pupils' confidence and consistency in using the learning outlined in the Autumn term.
- Analyse the results and use information to help focus the intervention sessions, as needed, for the following term.

Year 6: Autumn 2: Week 6

The focus of the consolidation should be the following aspects:

- Count on/back from a given number in steps of 10/100/1000/10000 to 1,000,000 and beyond
- Count on/back in whole numbers, fraction and decimal sequences through zero to include negative numbers (e.g. 2.5 or 1 ¼)
- Find 0.01, 0.1, 1, 10 and powers of 10 more or less than a given number
- Read, write, partition, order and compare numbers to 1,000,000 and beyond
- Round any number to 1,000,000 to the nearest 10, 100, 1000, 10,000 and 100,000 (e.g. round 5 digit number to the nearest 10.000; 6 digit number to the nearest 100,000)
- Order and compare numbers including integers, decimals and negative numbers
- Read, write, order, partition and compare decimal numbers up to 3dp
- Round decimals with 3dp to the nearest whole number or to one or two decimal places
- Multiply and divide drawing upon known facts and/or using place value
- Multiply and divide any whole and decimal number by 10, 100 and 1000 giving answers up to 2dp
- Mentally add and subtract tenths and one-digit whole numbers and tenths
- Add/subtract mentally a 5-digit number and 4- digit numbers (e.g. 15,345 + 2300 and 12,462 – 2300)
- Continue a linear number sequence with positive and negative numbers, decimal and proper fractions including through zero
- Find factors and factor pairs of each number to 100
- Convert units of measurement (km and m; cm and m; cm and mm; gram and km, ml and L and time)
- Find complements to 100, 1000 ,10,000 and to £5.00, £10.00 and £20.00

- Although practise and consolidation should be on-going through each half term, during Week 6 there should be greater opportunity taken to check pupils' learning and understanding.
- Summative and Formative assessment procedures should help teachers gain a clear picture as to which pupils are at different stages, including mastery and greater depth.

YEAR 6: SPRING 1: Overview and Teaching Steps

WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
2 Place Value	**3 Geometry**	**3 Measures**	**3 Fractions**	**3 Multiplication & Division**	**4 Multiplication & Division**
Use negative numbers in context and calculate intervals across zero	- 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	Solve problems involving the calculation and conversion of units of measure, using decimal notation to three decimal places where appropriate.	Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.	Multiply multi-digit numbers up to 4-digits by a 2-digit whole number using the formal written method of long multiplication.	-Divide numbers up to 4-digits by a 2-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 2-digit number using the formal written method of short division, where appropriate, interpreting remainders according to the context.
➢ Interpret intervals and differences in context, e.g. temperature ➢ Calculate intervals from -100 to 100	➢ Read coordinates in all four quadrants ➢ Plot points using coordinates in all four quadrants ➢ Create shapes by plotting points in all four quadrants ➢ Use four quadrants of the grid to draw different shapes ➢ Reflect a shape in any of the axes and re-plot ➢ Translate a shape into any of the quadrants or across quadrants	➢ Use decimal notation to 3dp to solve calculations with measures ➢ Use other compound units for speed such as miles per hour and apply knowledge in science	➢ Work out the common denominator for a pair of fractions with different denominators. ➢ Add two fractions with different denominators. ➢ Add more than two fractions with different denominators. ➢ Subtract one fraction from another with different denominators. ➢ Subtract one mixed number from another where there are different denominators.	➢ Use formal method of multiplication of ThHTU x TU	➢ Divide any number with 4-digits by a 2-digit number without a remainder. ➢ Divide any number with 4-digits by a 2-digit number with a remainder. ➢ Use rounding to express answers as whole numbers. ➢ Know when an answer has to be a whole number and a remainder is not appropriate. ➢ Use a formal method to divide any number with 4-digits by a 2-digit number without a remainder. ➢ Use a formal method to divide any number with 4-digits by a 2-digit number with a remainder.

Year 6: Spring 1

Week 1: Place Value
Use negative numbers in context and calculate intervals across zero

Spring 1: Week 1: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Spring 1: Week 1
Objective: Place Value	Use negative numbers in context and calculate intervals across zero

What is the difference between these two numbers?			***What comes next?***	
-3 and +4			-8; -6; -4;	
-5 and -1			-10; -9; -8;	
-7 and +6			-35; -23; -11;	
-8 and +2			-23; -19; 15;	
-8 and +5			+8; +6: +4 +2; 0;	
-10 and +7			-120; -104; -88;	
-12 and +32			+200; + 70;	
-34 and +61			-34; -24; -14; -4;	

Spring 1: Week 1: Practice and Consolidation

Place Value: Use negative numbers in context and calculate intervals across zero

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Interpret intervals and differences in context, e.g. temperature ➢ Calculate intervals from -100 to 100	• Revise learning already covered in relation to negative numbers from Years 4 and 5; • Ensure pupils are confident in dealing with: knowing the difference between a positive and a negative number; continuing a sequence which includes negative and positive numbers. • Find examples of when negative numbers are used in context such as measuring temperature. • Look at the rules of adding and subtracting negative numbers	What is the difference between these pairs of numbers: -3 and +6; -6 and +8; -9 and +4; -3 and +6 +8 and -4; +125 and -125; +67 and -34; -100 and +60 -34 and +54 -89 and +230 -23 and +67 -90 and -67 What are the next numbers in the following sequences: -34; -24; -14; -4; ☐ ☐ +56; +46; +36; +26; +16; +6; ☐ ☐ -3; +4; -2; +5; ☐ ; +6; ☐ -17; +5; -7; +15; +3; ☐ ; +13; ☐ Look at the temperature chart below:

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
-7°	-9°	-11°	-15°	-9°	-7°	-7°	-10°	-12°	-14°

It shows the lowest recorded temperature in the first 10 days in January. What is the difference between the warmest and coldest day?
If the highest recorded temperature for each of these days was 5° warmer, make up another chart showing the warmest temperatures on each of the days.

Spring 1: Week 1: Mastering this Objective – Deeper Understanding

Place Value: Use negative numbers in context and calculate intervals across zero

Teaching Sequence	If pupils have mastered this objective they will be able to complete these activities independently:	
➢ Interpret intervals and differences in context, e.g. temperature ➢ Calculate intervals from -100 to 100	-18 is the 8th number in the sequence and -10 is the 4th in the sequence. What is the first number? -7 is the 7th number in the sequence; +5 is the 3rd number in the sequence. What is the 2nd and fifth numbers? -18 is the 10th number in the sequence; +27 is the 1st in the sequence; +7 is the 5th in the sequence. hat is the 2nd and the 8th numbers?	Put the following numbers in order (smallest to largest): -3.42; -3.41; 3.19; 3.2; -3.12; -3.67; -3.01 -5.67; -5.48; 5.62; -5.91; 5.32; -5.34; -5.01 -7.65; -7.34; -7.23; 7.1; 7.2; -7.01; -702; 7.31 -9.12; -9.13; -9.1; 9.2; 9.5; -9.56; -9.78; -9.9 0.1; -0.1; 0.23; -0.23; 0.77; -0.77; -0.78; 1.1
	 Children on holiday were having fun diving off the rocks. There were three platforms to dive from: A was 5.5m above the sea level; B was 3.3m above the sea level and C was 1.2m above the sea level. The children's dives took them deep in to the sea. Answer the following questions about the diving	Helen dived from Platform A and reached a depth of -3.5m. John dived from Platform B and reached a depth of -2 16m. Hamid dived from Platform A and reached a depth of -3.71m. Rose dived from Platform C and reached a depth of 0.73m below the sea. Holly dived from Platform C and reached a depth of -0.53m. For each, work out how far they dived from take off to the depth below the sea.

Spring 1: Week 1: Working at greater depth

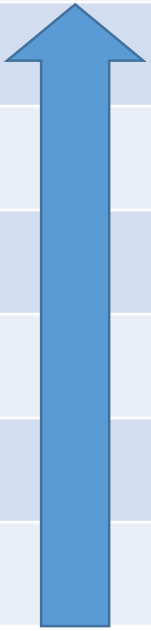
Place Value: Use negative numbers in context and calculate intervals across zero

Teaching Sequence	Activities for pupils working at greater depth:	
➢ Interpret intervals and differences in context, e.g. temperature ➢ Calculate intervals from -100 to 100	**Polar Expedition** The Arctic explorers set off from base camp with the temperature being -9°C; for every 500m they walked the temperature dropped 0.5°C. What was the temperature when they had walked for 6Km? What was the temperature when they had walked for 10Km? How far had they walked when the temperature was -18°C?	**Game** Create an interesting game that would appeal to Year 4 pupils which involves negative and positive numbers between -50 and +50. You need to think of a game, gather the resources you need for it; trial it in class; write a set of rules for it that can be followed by Year 4 pupils. Make it as interesting as you can.
	Mountain Climbing Two mountaineers attempt to climb one of The Himalayas most difficult and coldest mountains. They took 5 days. As they set off the temperature was 3°C. By Day 2 the temperature had dropped by 6°C By Day 3 it had only dropped half as much as on Day 2. However, on Day 4 it dropped by another 10°C and dropped a further 6°C on Day 5. What was the temperature by the end of the climb? Make up similar problems for your friends to solve.	**Business Problem** A businessman was experiencing a difficult time. It cost £3,500 a day to run his business. He started with £6,000 in his bank. On Day 1 he sold £120 worth of products. On Day 2 he sold £40 worth of products. On Day 3 he sold £350 worth of products. On Day 4 he was closed. On Day 5 he sold half as much as he had done on Days 1 to 4. On Day 6 he sold £500 worth of products. For every day he had a negative amount in his bank the bank charged him £100 per day. How much did he have in his bank by the end of Day 6? How much on the end of Day 3?

Spring 1: Week 1: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Place Value: Use negative numbers in context and calculate intervals across zero	Me	My Teacher
Do you know what happens when subtracting a negative number from another negative number?		
Can you deal with negative numbers in a problem solving format?		
Can you add any 2 negative numbers together?		
Can you calculate the interval from + 30 to -30?		
Can you calculate the interval from - 20 to + 100?		
Can you interpret temperatures at minus ^{0}C on a thermometer?		



Year 6: Spring 1

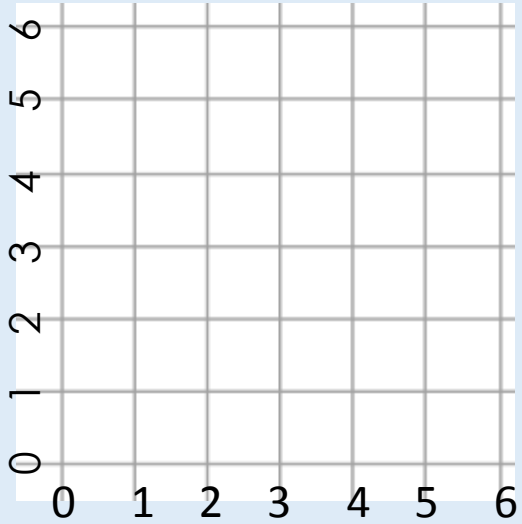
Week 2: Geometry

- 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

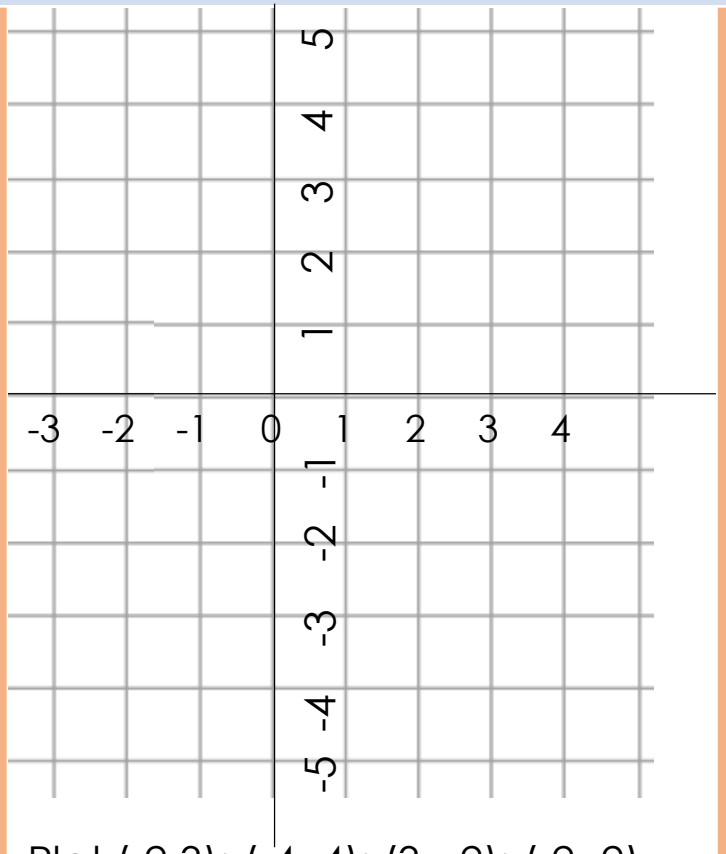
Spring 1: Week 2: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Spring 1: Week 2
Objective: Geometry	- 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



Plot (2,3); (4,1); (5,5); (3,6)



Plot (-2,3); (-4, 4); (3, -2); (-2,-2)

Spring 1: Week 2: Practice and Consolidation

Geometry: - 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

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Read coordinates in all four quadrants ➢ Plot points using coordinates in all four quadrants ➢ Create shapes by plotting points in all four quadrants ➢ Use four quadrants of the grid to draw different shapes ➢ Reflect a shape in any of the axes and re-plot ➢ Translate a shape into any of the quadrants, or across quadrants	• Remind pupils of the 4 quadrants and number them together. • Show pupils how to number the axes using negative numbers on the left horizontal axis and on the bottom vertical axis. • Firstly get pupils to plot points using the numbers. • Move on to get them to plot shapes such as triangles and rectangles before moving on to more complex shapes. • Then move on to translating and reflecting shapes across all 4 quadrants. • Ensure pupils know the words: origin (0,0) and that they always put the horizontal axis before the vertical axis.	Set out a 4 quadrant plane on your squared paper. Mark from the origin 5 to the left and 5 to the right, that is -5 to +5. Now mark the vertical axis from the origin 5 up and 5 down (that is +5 to -5). Now find these points: -3,+2; -4,+3; +4,-2; -3,-3; -4,+2; -1, 0; +1,-1; -1,+2; +3,-2
		Draw a triangle in Quadrant I and plot the points. Draw a rectangle in Quadrant II and plot the points Draw a right-angled triangle in Quadrant III and plot the points Draw a square in Quadrant IV and plot the points.
		Draw a triangle on (-4,1); (-3,4) and (-1,3) and translate it so that (-4,1) becomes (1,1). What are the other two points? Now draw it.
		Draw a triangle on (-4,1); (-3,4) and (-1,3) and reflect it to Quadrant III. What are the points of the reflected triangle? Now draw another triangle in Quadrant I and reflect it to Quadrant IV. Write out the points of both triangles. What do you notice?

Spring 1: Week 2: Mastering this Objective – Deeper Understanding

Geometry: - 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

Teaching Sequence

- Read coordinates in all four quadrants
- Plot points using coordinates in all four quadrants
- Create shapes by plotting points in all four quadrants
- Use four quadrants of the grid to draw different shapes
- Reflect a shape in any of the axes and re-plot
- Translate a shape into any of the quadrants, or across quadrants

If pupils have mastered this objective they will be able to complete these activities independently:

Squares and Rectangles

If a square has 2 vertices on (4,3) and (4,-3) where could the other two vertices be?

If a square has 2 vertices on (3,3) and (-1,3) where could the other two vertices be?

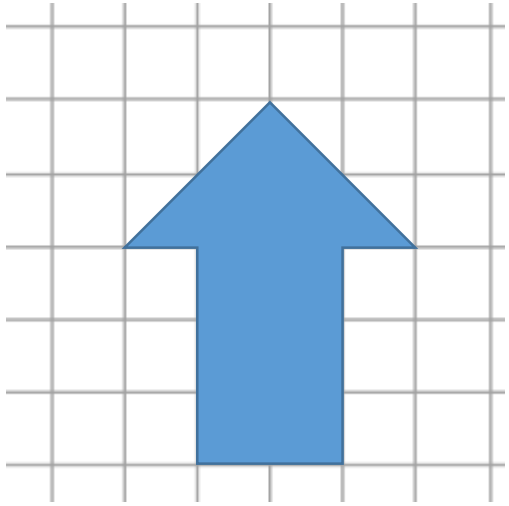
If a square has 2 vertices on (-5,5) and (-2,5) where could the other two vertices be?

If a rectangle has 2 vertices on (5,4) and (1,5) where could the other two vertices be?

Pentagon Time

Plot a pentagon in quadrant I or II.
Write down their vertices carefully.
Translate the pentagon to another quadrant, moving one of the vertices 2 points up or down the vertical axis.
Write up the new coordinates.

Now prepare one for your friend to complete.



Plot an arrow shape as shown in any quadrant you wish.
The arrow can be turned in any way you wish.
Make a note of the 7 coordinates.
Now translate this shape into another quadrant in any way you wish but note the coordinates and ensure that it remains the same shape and size.
Now reflect this shape into another quadrant of your choice.

Spring 1: Week 2: Working at greater depth

Geometry: - 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

Teaching Sequence

- Read coordinates in all four quadrants
- Plot points using coordinates in all four quadrants
- Create shapes by plotting points in all four quadrants
- Use four quadrants of the grid to draw different shapes
- Reflect a shape in any of the axes and re-plot
- Translate a shape into any of the quadrants, or across quadrants

Activities for pupils working at greater depth:

Playing with Letters

Use squared paper that has been split into the 4 quadrants and marked from -10 to +10 across the vertical and horizontal axes. Take the letters below and plot them onto Quadrant I and Quadrant III respectively

Now reflect the 'L' shape to Quadrant 2 and the 'X' shape to Quadrant IV.
Write down the coordinates for each.

Isosceles Triangle

An isosceles triangle has two vertices at: (-3,-2) and (3,-2). What could the third one be.

Another isosceles triangle has two vertices at: (-1,1) and (-1, -1).
Find at least 3 possibilities for the third vertices.

Now create some isosceles problems of this type for your friends to solve.

Plotting Equilateral Triangles

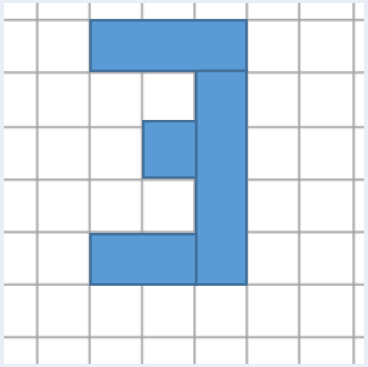
An equilateral triangle has (1,-4) and (5, -4) as two of its vertices, what could the third vertices be? There are two possibilities.

Can you plot two vertices of an equilateral triangle and ask your friend to find the third?

Once you have found the third vertices, reflect the triangle to another quadrant.

Number Fun

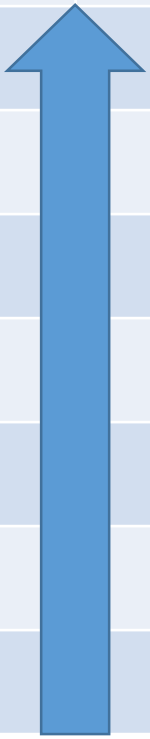
In one of the 4 quadrants, plot a number in the style shown and then translate it into each of the other 3 quadrants and then reflect it into each of the other three quadrants.
Write up the coordinates for each.



Spring 1: Week 2: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Geometry: - 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	Me	My Teacher
Can you translate a shape into any of the quadrants, or across quadrants?		
Can you reflect a shape in any of the axes and re-plot?		
Can you use the four quadrants of the grid to draw different shapes?		
Can you create shapes by plotting points in all four quadrants?		
Can you plot points using coordinates in all four quadrants?		
Can you read coordinates in all 4 quadrants?		
Do you know how the 4 quadrants are formed and named?		



Year 6: Spring 1

Week 3: Measures

Solve problems involving the calculation and conversion of units of measure, using decimal notation to three decimal places where appropriate.

Spring 1: Week 3: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Spring 1: Week 3
Objective: Measures	Solve problems involving the calculation and conversion of units of measure, using decimal notation to three decimal places where appropriate.

How many metres in:			***How many Kg. in:***		
3.235Km			24891grams		
4.258Km			62321grams		
4000cm			457grams		
3600cm			How many p in:		
30,000mm			£23.19		
6.72Km			£10		
8.1Km			£5.05		

Spring 1: Week 3 : Practice and Consolidation

Measures: Solve problems involving the calculation and conversion of units of measure, using decimal notation to three decimal places where appropriate.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Use decimal notation to 3dp to solve calculations with measures ➢ Use other compound units for speed such as miles per hour and apply knowledge in science	• This unit focuses on pupils' ability to recognise amounts written in decimal format and to be able to know how many smaller units there are in larger ones and vice versa. • It would be helpful to physically show pupils different comparisons, ie, 1000 grams and 1 Kg; and 1000 metres and 1 Km. • One of the main things to drill home is that there are units of 1000 in some, eg, m to Km and units of 100 in others, eg, cm to metres. • Talk about the way we travel and how the speedometers in British cars have both imperial and metric measures but it is imperial that is still used by most people.	How many metres in the following: 2340cm 1.567km 2.463km 12783cm 12Km 123.1km 23.145km 134908mm 6720cm 2.789Km How many seconds are there between 8.10am and 3.15pm? How many grams in 3.127Kg? It is 5.35am what will be the time in 15,000 seconds? How many ml in 5.35 litres? The tests started at 9.15am; Paper A took 2,100 seconds and Paper B took double the time of Paper B. What time was it when the test ended? *Assuming that 8Km is approximately 5 miles.* A car travels at 30 miles per hour for 30 minutes. How many kilometres will it have travelled? A car travels at 60 miles per hour for 90 minutes. How many kilometres will it have travelled? A car travels at 80 Km per hour for 30 minutes. How many miles will it have travelled? A 2Kg bag of potatoes contains 8 potatoes. How much does each potato weigh? A 1Kg bag of tomatoes contains 16 tomatoes. How much does each tomato weigh?

Spring 1: Week 3: Mastering this Objective – Deeper Understanding

Measures: Solve problems involving the calculation and conversion of units of measure, using decimal notation to three decimal places where appropriate.

Teaching Sequence	If pupils have mastered this objective they will be able to complete these activities independently:	
➢ Use decimal notation to 3dp to solve calculations with measures ➢ Use other compound units for speed such as miles per hour and apply knowledge in science	Chey, Amir and Sam have parcels. Amir's parcel weighs 3.6kg, Chey's parcel is 2500g and Sam's parcel is half the weight of Amir's parcel. How much heavier is Amir's parcel than Chey's parcel? How much heavier is Chey's parcel than Sam's parcel? Write down some other statements about the parcels.	*If 8 km = approximately 5 miles;* answer these: 16km = ☐ miles 4 km = ☐ miles 80Km = ☐ miles Fill in the missing number of miles. Write down some more facts connecting kilometres and miles.
	If you take midnight on January 1st 2010 as your starting point, work out the following: At what time of day of what year will it be: • 2000 seconds after the start of 2010? • 2000 minutes after the start of 2010? • 2000 hours after the start of 2010? • 2000 days after the start of 2010? • 2000 weeks after the start of 2010?	Fuel costs 95p per litre. How much fuel will I get for exactly £50? How much for £70? Present your friends with some more. A runner takes 4 minutes and 10 seconds to run 1500 metres. Assuming she runs the same pace throughout how long will it take her to run 800 metres; 400 metres and 2000 metres?

Spring 1: Week 3: Working at greater depth

Measures: Solve problems involving the calculation and conversion of units of measure, using decimal notation to three decimal places where appropriate.

Teaching Sequence

- Use decimal notation to 3dp to solve calculations with measures
- Use other compound units for speed such as miles per hour and apply knowledge in science

Activities for pupils working at greater depth:

On a map of the locality, 2.5cm represents 1km.
Work out the actual distances between the towns and the amount of time it would take to travel between the towns if:

- The measurement between Town A and town B is 100 cm.
- A road between Town A and Town B measures 25% more than the distance as measured on a map.
- A car travels at 30km per hour between the two towns.

Distance between Town A and B (as measured on a map).	Time to travel by road between Town A and Town B.

Assuming that 8Km is approximately 5 miles.
If a car took 3 hours to travel 240Km, how many miles per hour did it travel?
If the car took 5 hours to travel 480Km, how many miles per hour did it travel?

Assuming that 8Km is approximately 5 miles.
A car travels 256 Km between Manchester and Newcastle.
It uses 1 litre of fuel for every 8 miles it travels.
Fuel costs 95p per litre.
How much does the journey cost?

Assuming that 8Km is approximately 5 miles.
Look at the following table outlining fuel consumption at different speeds:

Fuel Consumption	
speed	I litre
30mph	10Km
40mph	8Km
50mph	6Km
60mph	5Km
70mph	4Km

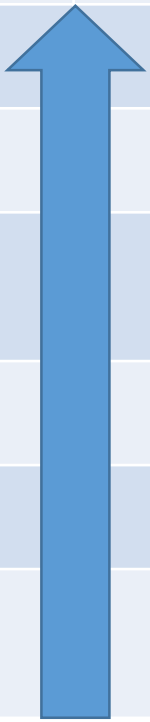
How far travelled at different speeds	
30mph	25 miles
40mph	15 miles
50mph	30 miles
60mph	50 miles
70mph	80 miles

The second table outlines the different speeds travelled during a 200 mile journey.
If fuel costs 95p per litre, how much did the journey cost?

Spring 1: Week 3: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Measures: Solve problems involving the calculation and conversion of units of measure, using decimal notation to three decimal places where appropriate.	Me	My Teacher
Can you answer questions related to speed using both miles and Km and converting between both?		
Can you convert between miles and Km and answer problems related to this?		
Can you convert between seconds and minutes and minutes and hours and between days and weeks and months?		
Can you use convert between ml. and litres using decimal notation up to 3 decimal places?		
Can you use convert between grams. and Kg using decimal notation up to 3 decimal places?		
Can you use convert between cms. and metres and metres and Km using decimal notation up to 3 decimal places?		



Year 6: Spring 1

Week 4: Fractions

Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.

Spring 1: Week 4: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Spring 1: Week 4
Objective: Fractions	Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.

$\frac{3}{4} + \frac{1}{4}$			$8\frac{5}{6} + 9\frac{1}{2}$		
$\frac{5}{6} + \frac{4}{5}$			$7\frac{1}{4} + 9\frac{7}{8}$		
$\frac{3}{4} + \frac{1}{8}$					
$\frac{1}{5} + \frac{3}{10}$			$\frac{3}{4} - \frac{5}{8}$		
$\frac{4}{5} + \frac{7}{10}$			$\frac{9}{10} - \frac{3}{8}$		

Spring 1: Week 4: Practice and Consolidation

Fractions: Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Work out the common denominator for a pair of fractions with different denominators. ➢ Add two fractions with different denominators. ➢ Add more than two fractions with different denominators. ➢ Subtract one fraction from another with different denominators. ➢ Subtract one mixed number from another where there are different denominators.	• This unit helps pupils see the relationship between fractions with different denominators by changing the fractions so that they have a common denominator. • The teaching element will mainly concentrate on helping pupils to change fractions so that they have a common denominator. • This needs to be done using simple apparatus with familiar fractions with tenths; eighths, etc. in the first instance.	Find the missing denominator or numerator in the following: $\frac{6}{8} = \frac{\square}{4}$; $\frac{14}{16} = \frac{\square}{8}$; $\frac{22}{24} = \frac{11}{\square}$; $\frac{5}{6} = \frac{10}{\square}$ Reduce the following improper fractions to their simplest mixed fraction form: $\frac{17}{5}$ $\frac{26}{8}$ $\frac{19}{3}$ $\frac{27}{4}$ $\frac{38}{10}$ $\frac{16}{5}$ $\frac{52}{10}$ $\frac{19}{8}$ Complete these additions, presenting the answers in their simplest forms: $\frac{3}{4} + \frac{1}{8} = \square$ $\frac{3}{16} + \frac{3}{4} = \square$ $\frac{5}{7} + \frac{2}{3} = \square$ $\frac{3}{4} + \frac{7}{8} = \square$ Complete these subtractions, presenting the answers in their simplest forms: $\frac{7}{8} - \frac{1}{4} = \square$ $\frac{9}{10} - \frac{3}{8} = \square$ $1\frac{1}{2} - \frac{3}{8} = \square$ $2\frac{3}{4} - \frac{7}{8} = \square$ $4\frac{1}{4} - 1\frac{1}{2} = \square$

Spring 1: Week 4: Mastering this Objective – Deeper Understanding

Fractions: Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.

Teaching Sequence

- Work out the common denominator for a pair of fractions with different denominators.
- Add two fractions with different denominators.
- Add more than two fractions with different denominators.
- Subtract one fraction from another with different denominators.
- Subtract one mixed number from another where there are different denominators.

If pupils have mastered this objective they will be able to complete these activities independently:

Pizza Time

4 pizzas were delivered to a party of 10 children.
The vegetarian pizza was divided into 10;
The chicken pizza divided into 8 pieces;
The peperoni pizza divided into 6 pieces;
The ham and pineapple dived into 9.
Tom had 2 pieces of the vegetarian; 3 pieces of the chicken and 3 pieces of the ham and pineapple.
How much of a whole pizza did he eat?
Make up other questions and let your friends solve them.

Go Kart Racing

A circuit is 2km long.
The Red go Kart went around 3¾ laps of the track and the Blue go Kart went for 5¼ laps.
How far did they travel in total?

The Green go Kart travelled for 6¾Km

Fencing a Field

A farmer buys 3⅞km of wire netting to go around two separate rectangular fields.
He uses 1¾Km for the first field and 2⅜km for the second field.
How much wire netting does he have left?

What could be the perimeters and areas of the two fields?

Ordering

Order the following fractions (smallest first):

1. $\frac{5}{10}$ $\frac{6}{4}$ $\frac{7}{8}$ $\frac{8}{5}$ $\frac{2}{3}$ $\frac{6}{8}$ $\frac{7}{9}$ $\frac{8}{3}$

2. $\frac{9}{10}$ $\frac{3}{2}$ $\frac{7}{3}$ $\frac{3}{4}$ $\frac{7}{6}$ $\frac{2}{7}$ $\frac{6}{5}$ $\frac{7}{2}$

Spring 1: Week 4: Working at greater depth

Fractions: Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.

Teaching Sequence

- Work out the common denominator for a pair of fractions with different denominators.
- Add two fractions with different denominators.
- Add more than two fractions with different denominators.
- Subtract one fraction from another with different denominators.
- Subtract one mixed number from another where there are different denominators.

Activities for pupils working at greater depth:

Pizza Time

Three children were having an argument saying that one of them had eaten more pizza than the others.
They had 4 pizzas delivered:
The vegetarian pizza was divided into 6;
The chicken pizza divided into 10 pieces;
The peperoni pizza divided into 9 pieces;
The ham and pineapple dived into 8.
The table below shows how many pieces of each every had.
Work out who had most pizza.

Pizza	John	Frances	Aysha
Vegetarian	3	1	2
Chicken	2	4	4
Peperoni	2	4	3
Ham	3	2	3

Sharing Toys

Three children shared 275 toy figures. There were 3 different figures: storm troopers; galaxy raiders; and space pioneers. From the table below work out how many each had.

	Harry	Gill	Jem
Storm Troopers	20	2/5	¼
Galaxy raiders	½	1/5	30
Space Pioneers	¼	30	½

Adding and Subtracting

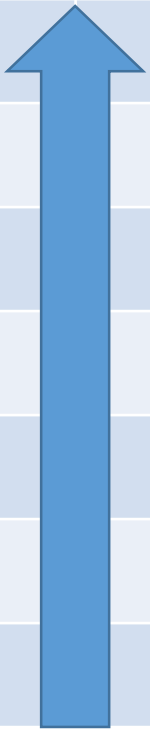
When I add two mixed numbers together where the fractional values have different denominators, my answer is 4⅜.
Give two examples of the numbers I added.

When I subtracted one mixed number from another where the fractions had different denominators, my answer was 3⅞.
Give two examples of the numbers I subtracted.

Spring 1: Week 4: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Fractions: Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.	Me	My Teacher
Can you solve problems involving fractions with different denominators in real contexts?		
Can you subtract 2 mixed numbers where the fractional values have different denominators?		
Can you subtract 2 fractions with different denominators?		
Can you add 2 mixed numbers where the fractional values have different denominators?		
Can you add any 2 fractions with different denominators?		
Can you work out the common denominator for a pair of fractions with different denominators, eg. ⅔ and ⅗ ?		
Can you add and subtract fractions with the same denominator?		



Year 6: Spring 1

Week 5: Multiplication & Division

Multiply multi-digit numbers up to 4-digits by a 2-digit whole number using the formal written method of long multiplication.

Spring 1: Week 5: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Spring 1: Week 5
Objective: Multiplication & Division	Multiply multi-digit numbers up to 4-digits by a 2-digit whole number using the formal written method of long multiplication.

230 3x	670 4x		1326 x25	8673 x45	
317 9x	785 8x		8471 x26	5686 x34	
902 x12	506 x26		3244 x34	7209 x24	
607 x24	809 x32		8655 x45	6587 x34	

Spring 1: Week 5: Practice and Consolidation

Multiplication & Division: Multiply multi-digit numbers up to 4-digits by a 2-digit whole number using the formal written method of long multiplication.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Use formal method of multiplication of ThHTU x TU	• The most important part of this unit is to get pupils to set out their calculation in the columnar system. • Take pupils through the grid and other methods to help clarify understanding but it is important that they work to the columnar system and practice it. • Their times tables knowledge needs to be very secure to enable them to be successful.	Complete the following: 234 x 7 267 x 8 257 x 9 1245 x 6 1568 x9 3312 x 8 4512 x 8 7238 x 7 Complete the following using formal methods: 234 x 12 356 x 11 2672 x12 3467 x 14 1461 x 17 1934 x 18 2459 x 13 3456 x 18 Complete the following using formal methods: Which is larger? By how much? 1276 x 23 or 2658 x 25 1278 x 34 or 7236 x 26 5285 x 18 or 8265 x 23 7432 x 14 or 6439 x 19 4825 x 67 or 3562 x 69 6318 x 18 or 3499 x 34 Each block within a stadium held 2356 people. There were 34 blocks altogether. How many people did the stadium hold? If only 18 blocks were filled, how many people were in the stadium and how many seats were empty?

Spring 1: Week 5: Mastering this Objective – Deeper Understanding

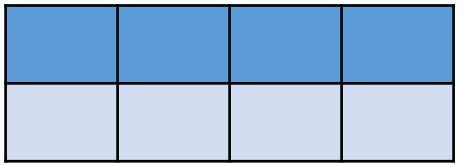
Multiplication & Division: Multiply multi-digit numbers up to 4-digits by a 2-digit whole number using the formal written method of long multiplication.

Teaching Sequence

- Use formal method of multiplication of ThHTU x TU

If pupils have mastered this objective they will be able to complete these activities independently:

Throw the two dice and add the numbers together. If the sum is 10 then call it a 1; if it is 11 then call it 2 and if it is 12 call it 3.



Starting at the top left put the sum of each throw in the top left hand corner.

Multiply the 4-digit number created in the top row by each of the 2-digit numbers created in each of the columns. Then do the same with 4-digit numbers created in the bottom row. It should give you 8 calculations altogether.

Using the 4 number cards above, how many 4-digit numbers can you make? Multiply each of these numbers by 23 and set out your calculation using formal methods.

Football Floodlights

A football team discovered that it was much cheaper to buy energy saving bulbs for the floodlights. They needed 32 bulbs each costing £95.95.
They needed these for each of their 4 floodlight pylons.
How much will they have to spend altogether?

Party Bags

A parent wants to buy party bags for her son's birthday party. Each bag costs £11.78 and there are 25 children going to the party.
How much will all the party bags cost?

Sponsored event

At a special sponsored event 16 people each swim 2396 metres.
How far will they swim altogether?
How much will they raise if they get 15p for every completed 100m?

Spring 1: Week 5: Working at greater depth

Multiplication & Division: Multiply multi-digit numbers up to 4-digits by a 2-digit whole number using the formal written method of long multiplication.

Teaching Sequence

- Use formal method of multiplication of ThHTU x TU

Activities for pupils working at greater depth:

Finding numbers from a given product

The product of a 4-digit digit number and a 2-digit number is 354,123
What could the numbers be?
Is there more than one solution?

The product of another 4-digit digit number and another 2-digit number is 91,425
What could the numbers be?
Is there more than one solution?

Missing Digits

Work out what the missing digits are in these calculations:

21★5	6★17	★248
x 17	x 19	x 21
36465	118123	152208

3419	★206	4153
x 1★	x 23	x 2★
61542	73738	99672

Now make up some similar problems for your friends

Matrix Fun

Look at the table below:

3	5	6	9
1	4	7	2

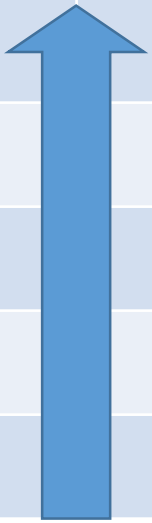
Multiply the two, 4-digit numbers created in the horizontal rows by the 2-digit numbers created in the vertical columns, ie,
(3569 x 31) + (1472 x 31)
(3569 x 54) + (1472 x 54)
(3569 x 67) + (1472 x 67)
(3569 x 92) + (1472 x 92)
Now using only the digits 0 to 9 once fill in the matrix below so that the additions of the four sets on numbers are as close to each other as possible.

This should be set up as a competition between you and your friends.

Spring 1: Week 5: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Multiplication & Division: Multiply multi-digit numbers up to 4-digits by a 2-digit whole number using the formal written method of long multiplication.	Me	My Teacher
Can you multiply a 4-digit number by a TU number using a formal method of long multiplication?		
Can you multiply a 4-digit number by a TU number?		
Can you multiply ThHTU x U?		
Can you multiply HTU x U?		
Can you multiply TU x U?		



Year 6: Spring 1

Week 6: Multiplication & Division

-Divide numbers up to 4-digits by a 2-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 2-digit number using the formal written method of short division, where appropriate, interpreting remainders according to the context.

Spring 1: Week 6: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Spring 1: Week 6
Objective: Multiplication & Division	-Divide numbers up to 4-digits by a 2-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 2-digit number using the formal written method of short division, where appropriate, interpreting remainders according to the context.

285 ÷ 5	252 ÷ 4		9150 ÷ 19	6076 ÷ 13	
378 ÷ 6	282 ÷ 3		3247 ÷ 13	7209 ÷ 35	
270÷18	3424÷16		8987 ÷ 36	8656 ÷ 33	
5655÷15	5267÷19		**Express remainder as a fraction or round answer to nearest whole number.**		

Spring 1: Week 6: Practice and Consolidation

Multiplication & Division: -Divide numbers up to 4-digits by a 2-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 2-digit number using the formal written method of short division, where appropriate, interpreting remainders according to the context.

Teaching Sequence

- Divide any number with 4-digits by a 2-digit number without a remainder.
- Divide any number with 4-digits by a 2-digit number with a remainder.
- Use rounding to express answers as whole numbers.
- Know when an answer has to be a whole number and a remainder is not appropriate.
- Use a formal method to divide any number with 4-digits by a 2-digit number without a remainder.
- Use a formal method to divide any number with 4-digits by a 2-digit number with a remainder.

Oral and Mental Activities Examples:

- Help pupils to set out their work correctly so that they are able to follow the same system whenever they are dividing by a 2-digit number.
- Talk about different ways of dealing with remainders and effectively explain to them what a remainder is.
- Remainders could be expressed as: simply, what is left; a fraction or rounded to the nearest whole.

Pencil and Paper Activities Examples:

Calculate the following, expressing remainders where they exist as a fraction:

245 ÷ 7	562 ÷ 8	725 ÷ 9	825 ÷ 6
936 ÷ 5	892 ÷ 6	934 ÷ 8	823 ÷ 8

Calculate the following, expressing remainders as remainders, ie 123 r 5.

1236 ÷ 15	3478 ÷ 16	6725 ÷ 17	8934 ÷ 18
3572 ÷ 18	7823 ÷ 19	2389 ÷ 23	7563 ÷ 26
6723 ÷ 23	87123 ÷ 24	98654 ÷ 25	89231 ÷ 34

Calculate the following but round the remainder to the nearest whole number:

23467 ÷ 13	25672 ÷ 18	8945 ÷ 23	78453 ÷ 25

A shop receives stickers before the European Championship started.
Altogether the shop receives 7875 stickers on a total of 63 sheets.
How many stickers were there on each sheet?

Spring 1: Week 6: Mastering this Objective – Deeper Understanding

Multiplication & Division: -Divide numbers up to 4-digits by a 2-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 2-digit number using the formal written method of short division, where appropriate, interpreting remainders according to the context.

Teaching Sequence

- Divide any number with 4-digits by a 2-digit number without a remainder.
- Divide any number with 4-digits by a 2-digit number with a remainder.
- Use rounding to express answers as whole numbers.
- Know when an answer has to be a whole number and a remainder is not appropriate.
- Use a formal method to divide any number with 4-digits by a 2-digit number without a remainder.
- Use a formal method to divide any number with 4-digits by a 2-digit number with a remainder.

If pupils have mastered this objective they will be able to complete these activities independently:

Favourite Team

All pupils in a Manchester school were asked to vote for their favourite Manchester team.
They voted 7 to 5 in favour of Manchester United over Manchester City.
If 2820 pupils voted altogether, how many voted for United and how many voted for City?

What is the missing number?

18 ★ 4 ÷ 12 = 157

38 ★ 6 ÷ 18 = 212

33 ★ 02 ÷ 8 = 4215

125 ★ 2 ÷ 7 = 1786

3579 ÷ 1 ★ = 298 r 3

Using the 4 cards above make up as many 4-digit numbers as you can.
Now look at the three cards below:

Make up as many 2-digit numbers as you can from these three cards.
Divide each of the 4-digit numbers by each of the 2-digit numbers you have created.

Building Fun

A builder was building 16 houses on a new estate. He ordered 153,600 bricks, expecting that to be enough for all the houses.
However, he discovered that he had to order another 14,400.
How many bricks were used for each house?
How many bricks per house was he originally short of?

Spring 1: Week 6: Working at greater depth

Multiplication & Division: -Divide numbers up to 4-digits by a 2-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 2-digit number using the formal written method of short division, where appropriate, interpreting remainders according to the context.

Teaching Sequence

- Divide any number with 4-digits by a 2-digit number without a remainder.
- Divide any number with 4-digits by a 2-digit number with a remainder.
- Use rounding to express answers as whole numbers.
- Know when an answer has to be a whole number and a remainder is not appropriate.
- Use a formal method to divide any number with 4-digits by a 2-digit number without a remainder.
- Use a formal method to divide any number with 4-digits by a 2-digit number with a remainder.

Activities for pupils working at greater depth:

Chocaholics

Harry decides to buy all his 19 classmates a large bar of chocolate for helping him during the term.
He pays for the chocolate with a £50 note.
He receives £8.01 change.
How much does each bar cost?
The shop has a special offer the next day when he could have had a free bar for every three he bought.
How much money could Harry have saved if he had waited one day?

Football Floodlights

A football team discovered that it was much cheaper to buy energy saving bulbs for the floodlights.
The 64 bulbs cost £2624
Before they bought the energy saving bulbs their electricity bill was £15,986 per year.
After buying the bulbs their electricity bill fell to £8236 per year.
Including the cost of the new bulbs, how much money did the football team save?

Sponsored Walk

Billy raised £12,065 for a special sponsored walking event.
He received 15p for every metre he walked.
How many Km did he walk?

His brother, Danny, walked 80Km and received 12p for every metre he walked.
Did he raise more or less money than Billy?
What was the difference?

Working backwards

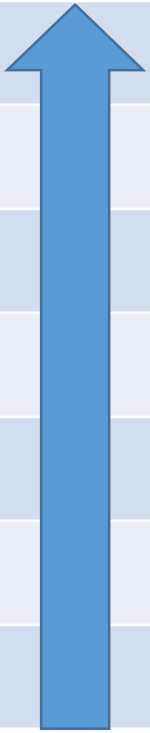
A 4-digit number divided by a 2-digit number gives an answer of 241.
What could the two numbers have been?

Another 4-digit number divided by another 2-digit number gives an answer of 392.
What could the two numbers have been?

Spring 1: Week 6: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Multiplication & Division: -Divide numbers up to 4-digits by a 2-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 2-digit number using the formal written method of short division, where appropriate, interpreting remainders according to the context.	Me	My Teacher
Can you solve problems which involve dividing by a 2-digit number?		
Can you use rounding up to express answers as a whole number?		
Can you divide numbers with up to 4-digits by any 2-digit number with and without remainder?		
Can you express remainder as a fractional value of the number divided by?		
Can you divide numbers with up to 4-digits by a 2-digit number up to 20 with remainder?		
Can you divide numbers with up to 4-digits by a 2-digit number up to 20 without remainder?		
Can you divide numbers with up to 4-digits by a single-digit number with and without remainders?		



YEAR 6 : SPRING 2: Overview and Teaching Steps

WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
2 Addition & Subtraction	**1 Ratio & Proportion**	**4 Geometry**	**4 Measures**	**1 Statistics**	**Consolidate and Assess**
Use knowledge of the order of operations to carry out calculations involving the four operations.	-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 of whole numbers or measures such as 15% of 360 and the use of percentages for comparison.	Recognise, describe and build simple 3D shapes, including making nets.	Recognise when it is possible to use the formulae for area & volume of shapes.	Interpret and construct: - pie charts - line graphs and use these to solve problems	Start this week by revising the learning covered in the Autumn and Spring terms so as to ensure pupils are fluent and secure with their basic skills. Use a simple assessment process to check on pupils' confidence and consistency in using the learning outlined in the Autumn and Spring terms. Analyse the results and use information to help focus the intervention sessions, as needed, for the following term.
➢ Explain the order to solve calculations ➢ Solve calculations in correct order	➢ Understand that quantities change at the same rate. ➢ Find equivalent ratios. ➢ Solve problems involving similar shapes or quantities where the scale factor is known or can be found. ➢ Recognise 50% as being half of original value. ➢ Recognise 25% as being quarter of original value. ➢ Recognise 75% as being three-quarters of original value. ➢ Recognise 10% as being one-tenth of original value. ➢ Know that to find 1% you divide by 100 ➢ Find 25%, 50%, 75% of any given value ➢ Find 5%, 10%, 20%, 50% etc. of a given value. ➢ Find % of a given value.	➢ Know what the net for a cube looks like ➢ Create a cube from a net ➢ Make a net to create a cube ➢ Know what the net for a cuboid looks like ➢ Create a cuboid from a net ➢ Make a net to create a cuboid ➢ Make a net to create a square based pyramid ➢ Make a net to create a triangular based pyramid	➢ Know when to apply a given formula to find the area of a shape ➢ Know when to apply a given formula to find the volume of a shape	➢ Know what a pie chart is ➢ Read a simple pie chart with segments that are divisible by 10 ➢ Use information from pie chart to solve a problem ➢ Construct a pie chart from a set of given information with data in multiples of 6 or 12 ➢ Use knowledge of angles to measure segments of pie charts accurately ➢ Interpret information from line graphs to answer questions ➢ Know how to read scales on line graphs ➢ Draw own line graphs with range of scales	

Year 6: Spring 2

Week 1: Addition & Subtraction

Use knowledge of the order of operations to carry out calculations involving the four operations.

Spring 2: Week 1: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Spring 2: Week 1
Objective: Addition & Subtraction	Use knowledge of the order of operations to carry out calculations involving the four operations.

Use brackets to make these calculations correct		***Calculate the following:***		
3 + 4 – 2 = 5		(23 + 7) + 9 =		
3 + 4 – 2 = 1				
		(34 – 9) + 7 =		
16 x 2 + 4 = 36				
16 x 2 + 4 = 96		(5 x 4) + (6 x 3) =		
25 + 5 x 6 = 180		(90 – 50) x 4 =		
25 + 5 x 6 = 55				

Spring 2: Week 1: Practice and Consolidation

Addition & Subtraction: Use knowledge of the order of operations to carry out calculations involving the four operations.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Explain the order to solve calculations ➢ Solve calculations in correct order	• This unit is about helping pupils to know the order in which they deal with the order of operations. • Talk to the pupils about the term BODMAS and take pupils through the preference order: brackets; of; divide; multiply; add and subtract. • Start by using the bracket very prominently before moving on to look at the order more generally. • Show pupils how the order is very important and how different answers can be had if they do not attend to the order.	Complete the following: (12 + 7) + (3-1) = ☐ (56 – 7) x 2 = ☐ (9 - 6) + (19 + 6) = ☐ (23 + 7) – (34 -32) = ☐ 5 x 4 + (99 + 34) = ☐ (7 x 7) – (8 x 8) = ☐ Complete these calculation pairs by putting in the brackets. What do you notice? 34 + 9 x 7 = 97 45 x 3 + 8 = 143 34 + 9 x 7 = 301 45 x 3 + 8 = 495 67 – 3 x 4 = 55 23 x 7 – 5 = 46 67 – 3 x 4 = 256 23 x 7 – 5 = 156 Using the BODMAS rule complete the following: 34 + 5 – 8 = ☐ 45 x 2 + 6 = ☐ 123 + 56 x 2 = ☐ 152 ÷ 4 + 7 = ☐ 56 x 4 + 8 = ☐ (23 + 56) x 5 = ☐

Spring 2: Week 1: Mastering this Objective – Deeper Understanding

Addition & Subtraction: Use knowledge of the order of operations to carry out calculations involving the four operations.

Teaching Sequence	If pupils have mastered this objective they will be able to complete these activities independently:	
➢ Explain the order to solve calculations ➢ Solve calculations in correct order	Compare the following: 45 + 12 x 6 and (45 + 12) x 6 What do you notice? Choose the correct operations to go into the empty boxes to make these number sentences correct. 8 ☐ 5 ☐ 9 = 22 8 ☐ 5 ☐ 9 = 53 8 ☐ 5 ☐ 9 = 31	Put brackets in these number sentences so that they are true: 14 – 5 x 7 = 63 6 + 6 x 7 = 48 11 – 7 + 9 = 13 72 ÷ 8 + 9 = 18 9 x 9 ÷ 3 = 27 12 x 4 ÷ 2 = 24 45 + 64 x 5 = 545 66 x 3 + 78 = 276 55 – 6 x 5 = 25 234 x 2 + 101 = 569 90 x 4 – 45 = 315 Now put the bracket in a different place and work out a different answer.
	By choosing different operations, including brackets, how many different number sentences can you create with these numbers in this order?: 23 17 4 2 = 35 3 7 21 =	Think of the order of operations and then make these number sentences true. ☐ + ☐ x ☐ = 26 ☐ - ☐ ÷ ☐ = 3

Spring 2: Week 1: Working at greater depth

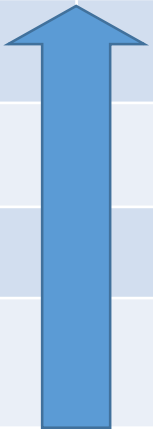
Addition & Subtraction: Use knowledge of the order of operations to carry out calculations involving the four operations.

Teaching Sequence	Activities for pupils working at greater depth:	
➢ Explain the order to solve calculations ➢ Solve calculations in correct order	**Different Operations** Write different number sentences using the digits 5, 7, 9 and 3 before the equals sign using: • One operation • Two operations but no bracket • Two operations but with a bracket Now do the same with the digits 3, 7, 8 and 9	**Same but different** Write a number sentence using the digits 2, 3, 5 and 8 before the equals sign. It must have been the same answer as another number sentence using the same four digits (2, 3, 5 and 8) before the equal sign but is not the same number sentence. Create another similar two sentences with another set of 4 digits which have the same answer.
	Multi-Sentences Create as many number sentences as you can with the following numbers before the equal sign . Keep the numbers in the same order but use brackets and any operation you require: 23; 45; 2; and 7 36; 12; 17 and 9 45; 17; 19 and 76	**Find the missing number** Find the missing number and complete the operation: 35 + ☐ - 12 x 2 = 17 6 x 3 + ☐ - 13 = 12 5 x ☐ + 17 – 5 = 32 16 ÷ 4 x ☐ = 20

Spring 2: Week 1: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Addition & Subtraction: Use knowledge of the order of operations to carry out calculations involving the four operations.	Me	My Teacher
Can you apply the rules of BODMAS to solve number sentence problems?		
Do you know the rules associated with BODMAS when deciding on the order of operations?		
Do you know that by using a bracket around certain operations in a multi- operation number sentence it can alter the outcome?		
Do you know that when you have a number sentence with more than one operation then the answer can differ according to the order you deal with operations?		



Year 6: Spring 2

Week 2: Ratio & Proportion

-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 of whole numbers or measures such as 15% of 360 and the use of percentages for comparison.

Spring 2: Week 2: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Spring 2: Week 2
Objective: Ratio & Proportion	-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 of whole numbers or measures such as 15% of 360 and the use of percentages for comparison.

50% of 268			1% of 500		
25% of 844			17% of 500		
75% of 1500			23% of 600		
50% of 238			95% of 1000		
25% of 260			65% of 250		
75% of 2375			80% of 2000		
10% of 2580			70% of 3500		
20% of 5160			95% of 2500		

Spring 2: Week 2: Practice and Consolidation

Ratio & Proportion: -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 of whole numbers or measures such as 15% of 360 and the use of percentages for comparison.

Teaching Sequence

- Understand that quantities change at the same rate.
- Find equivalent ratios.
- Solve problems involving similar shapes or quantities where the scale factor is known or can be found.
- Recognise 50% as being half of original value.
- Recognise 25% as being quarter of original value.
- Recognise 75% as being three-quarters of original value.
- Recognise 10% as being one-tenth of original value.
- Know that to find 1% you divide by 100
- Find 25%, 50%, 75% of any given value
- Find 5%, 10%, 20%, 50% etc. of a given value.
- Find % of a given value.

Oral and Mental Activities Examples:

- Focus on ratios in the first instance.
- Link equivalent fractions so that pupils can see that 2/3 can be 4/6 and the ration of 2:3 means the same as 4:6.
- Look at this in practical terms by looking at recipes and linking it to making greater or smaller quantities.
- Move on to look at percentages.
- Pupils need to realise that percentage is a part of 100, so that 50% is 50 parts of 100 which can be looked at as one half.
- Similarly 10% is effectively 1/10th

Pencil and Paper Activities Examples:

Find 50% of the following:
250grams; £3.50; 350Km; £17.50; 670 metres; £3.14

Find 25% of the following:
240grams £4.40 360Km £12.96 880 metres; £45.20

Ratio:

2 is to 3 as 4 is to ☐ 4 is to 16 as 5 is to ☐

9 is to 12 as 3 is to ☐ 8 is to 24 as 6 is to ☐

15 is to 20 as 12 is to ☐ 16 is to 24 as 20 is to ☐

Find 10% of the following values:

100 grams £1 150 metres 250cm
4Km £5 £6.50 1.2Kg 230mm

Find 20% of the following values:

200 grams £1.50 180 metres 280cm
6Km £5.50 £7.50 1.8Kg 290mm

Spring 2: Week 2: Mastering this Objective – Deeper Understanding

Ratio & Proportion: -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 of whole numbers or measures such as 15% of 360 and the use of percentages for comparison.

Teaching Sequence

- Understand that quantities change at the same rate.
- Find equivalent ratios.
- Solve problems involving similar shapes or quantities where the scale factor is known or can be found.
- Recognise 50% as being half of original value.
- Recognise 25% as being quarter of original value.
- Recognise 75% as being three-quarters of original value.
- Recognise 10% as being one-tenth of original value.
- Know that to find 1% you divide by 100
- Find 25%, 50%, 75% of any given value
- Find 5%, 10%, 20%, 50% etc. of a given value.
- Find % of a given value.

If pupils have mastered this objective they will be able to complete these activities independently:

Paint Mixing

Purple paint is made from red and blue paint mixed in the ratio of 3:5.
To make 40 litres of purple paint, how much of each colour is needed?

Orange paint is made from yellow and red paint mixed in the ratio of 1: 4.
To make 70 litres of paint, how much of each colour is needed?

Percentage Issue

80% of a sum of money = £240
What is 100% of the money?

75% of a length is 150cm
What is the total length?

30% of the weight is 270grams.
What is the total weight?

Finding numbers given a percentage

I think of a number and then reduce it by 15%. The number I end up with is 306. What was my original number?

I take 15% of my savings to pay for a car which costs £4500. How much did I have in my savings in the first place?

Pie Time

A recipe needs to include three times as much apple to peach. The total weight of apples and peaches in a recipe is 700 grams. How much apple do I need?

To make cup cakes I need to put in 4 times as much flour as sugar and 2 times as much flour as butter. If I use 100grams of sugar, how much flour and butter do I need?

Spring 2: Week 2: Working at greater depth

Ratio & Proportion: -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 of whole numbers or measures such as 15% of 360 and the use of percentages for comparison.

Teaching Sequence

- Understand that quantities change at the same rate.
- Find equivalent ratios.
- Solve problems involving similar shapes or quantities where the scale factor is known or can be found.
- Recognise 50% as being half of original value.
- Recognise 25% as being quarter of original value.
- Recognise 75% as being three-quarters of original value.
- Recognise 10% as being one-tenth of original value.
- Know that to find 1% you divide by 100
- Find 25%, 50%, 75% of any given value
- Find 5%, 10%, 20%, 50% etc. of a given value.
- Find % of a given value.

Activities for pupils working at greater depth:

Flower Beds

In a flower bed a gardener plants 3 red bulbs for every 4 white bulbs.
How many red and white bulbs might she plant?
If she has 100 white bulbs, how many red bulbs does she need to buy?
If she has 75 red bulbs, how many white bulbs does she need to buy?
If she wants to plant 140 bulbs altogether, how many of each colour should she buy?

Sale

In a sale where everything is reduced by 15%, I paid the following prices for three items.
£255, £850, £4.25
What was the original selling price?

Write similar sale problems for your friends to solve

Football Outing

A 50-seater coach travels to the match.
All of the seats are taken.
Junior tickets cost £13 and Adult tickets cost £23.
The only people on the coach are juniors and adults.
The total amount paid for tickets is approximately £900.
How many people on the coach were adults and how many were juniors?

Eggstraordinary

Farmer Henry spent exactly £10 on 100 eggs.
There were 3 sizes of eggs: Large; Medium and Small.
Large eggs cost 50p; Medium eggs cost 10p and Small eggs cost 5p.
For 2 of the sizes, he bought the same number of eggs.
How many of each size did he buy?

Spring 2: Week 2: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Ratio & Proportion: -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 of whole numbers or measures such as 15% of 360 and the use of percentages for comparison.	Me	My Teacher
Can you find any percentage of a given value, eg, 18% of 360?		
Can you find 10%, 20%, 30%, etc. of a given value?		
Can you find 25%, 50% and 75% of any given value?		
Do you know that to find 1% of a value you divide by 100?		
Do you recognise 10% as being a tenth of the original value?		
Do you recognise 75% as being three quarters of the original value?		
Do you recognise 25% as being a quarter of the original value?		
Do you recognise 50% as being a half of the original value?		

Year 6: Spring 2

Week 3: Geometry

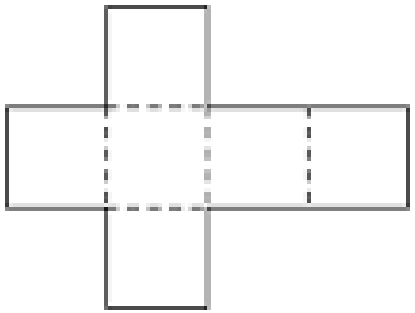
Recognise, describe and build simple 3D shapes, including making nets.

Spring 2: Week 3: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

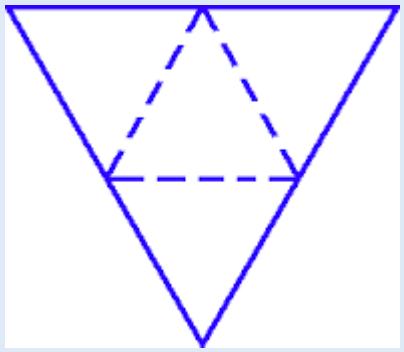
Name	Spring 2: Week 3
Objective: Geometry	Recognise, describe and build simple 3D shapes, including making nets.

What will this net make?



Draw a net for a cuboid.

What will this net make?



Draw a net for a square-based pyramid.

Spring 2: Week 3: Practice and Consolidation

Geometry: Recognise, describe and build simple 3D shapes, including making nets.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Know what the net for a cube looks like ➢ Create a cube from a net ➢ Make a net to create a cube ➢ Know what the net for a cuboid looks like ➢ Create a cuboid from a net ➢ Make a net to create a cuboid ➢ Make a net to create a square based pyramid ➢ Make a net to create a triangular based pyramid	• Revise previous learning on 3D shapes. • Remind pupils of the names of the most common 3D shapes: cube; cuboid; square and triangular based pyramids; cylinder; etc. • Explore the nets of these shapes and recognise how they change according to their sizes.	Make a net for a cube where the faces are 5cm x 5cm. Set out the net and create a cube from your net. Now create a cuboid where there are 4 faces 8cm x 5cm and 2 faces 5cm x 5cm
		Examine a square-based pyramid and work out its net. Create a net for a square-based pyramid where the base square has a side of 5cm. Make a net where each of the triangles is an equilateral triangle and then one where each of the triangles is an isosceles triangle.
		Examine a triangular-based pyramid and work out its net. Create a net for a triangular-based pyramid where the base triangle is an equilateral triangle with a side of 5cm. Make a net where each of the triangles is an equilateral triangle and then one where each of the triangles is an isosceles triangle. Does this work?
		Examine the net for a cylinder. What is the relationship between the circumference of the circles and the rectangle? Now create your own net for a cylinder and make up three different ones. What do you notice?

Spring 2: Week 3: Mastering this Objective – Deeper Understanding

Geometry: Recognise, describe and build simple 3D shapes, including making nets.

Teaching Sequence	If pupils have mastered this objective they will be able to complete these activities independently:	
➢ Know what the net for a cube looks like ➢ Create a cube from a net ➢ Make a net to create a cube ➢ Know what the net for a cuboid looks like ➢ Create a cuboid from a net ➢ Make a net to create a cuboid ➢ Make a net to create a square based pyramid ➢ Make a net to create a triangular based pyramid	**Pyramids: Same and Different** What is the same and what is different about the nets of a triangular prism and a square based pyramid? Make a triangular pyramid where the side of the triangle at the base is 10cm. Now make a square-based pyramid where the side of the square at the base is 10cm. Write out three things that are similar and three things that are different.	**Cuboid fun** Jess has 24 cubes which she uses to build a cuboid. Write the dimensions of cuboids that she could make. List all the possibilities. Start by taking 20 cubes. Can you create a cuboid with 20 cubes? Then take one more cube. Can you create a cuboid with 21 cubes. Carry on until you have up to 50 cubes.
	Strong Shapes From the same material build two triangular and two square-based pyramids. Then make two cubes and two cuboids. They need to be roughly the same size. Put each of the pairs of shapes 20cm apart and join them with a rule which acts as a bridge. See how much weight it can hold, starting by placing a 100gram weight on the bridge. What do you notice?	**Pyramid Design** Using lego, create a square-based pyramid. It can be as large or as small as you wish. When you have completed the pyramid explain how you set out to make it. Then do the same with a triangular-based pyramid. How can you create these using as few lego pieces as possible?

Spring 2: Week 3: Working at greater depth

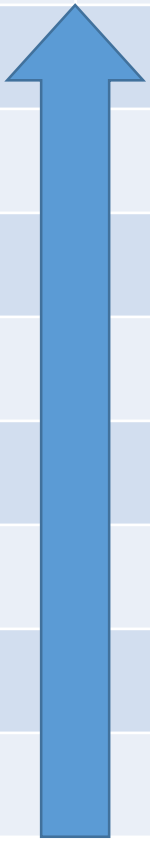
Geometry: Recognise, describe and build simple 3D shapes, including making nets.

Teaching Sequence	Activities for pupils working at greater depth:	
➢ Know what the net for a cube looks like ➢ Create a cube from a net ➢ Make a net to create a cube ➢ Know what the net for a cuboid looks like ➢ Create a cuboid from a net ➢ Make a net to create a cuboid ➢ Make a net to create a square based pyramid ➢ Make a net to create a triangular based pyramid	**Creating cubes and Cuboids** Given the volume create a cube or cuboid. Draw a net for a cube or cuboid that has a volume of 24 cm^3. Draw a net for a cube or cuboid that has a volume of 36 cm^3. Draw a net for a cube or cuboid that has a volume of 48 cm^3.	**Make a Robot and a Vehicle** From your knowledge of cubes; cuboids; cylinders; square-based pyramids; triangular based pyramids and cones, create a robot. The robot needs to be at least 20cm tall and has to have at least three different 3D shapes within it. Now use 3D shapes to create a moving vehicle. The vehicle has to be mobile and has to have at least 3 different 3D shapes.
	Futuristic City In a group of 4, create a futuristic city that you have designed together. The city has to have at least 10 3D shapes and has to have at least 4 different types of 3D shapes. You have to explain how your city works and why you have chosen the shapes you have. Your city needs to be environmentally friendly.	**City Emblem** You have been asked to design and make a model that will live at the entrance of your city, town or village. Essentially the model will be made up of different 3D shapes although you can add other features. Your model has to have features that link to your city, town or village. Start by researching modern designs such as the Angel of the North.

Spring 2: Week 3: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Geometry: Recognise, describe and build simple 3D shapes, including making nets.	Me	My Teacher
Can you create a square-based and triangular pyramid using knowledge of what the net looks like?		
Do you know what a net for a square based and triangular based pyramid looks like?		
Can you create a cylinder and cone using knowledge of what the net looks like?		
Do you know what a net for a cylinder and cone looks like?		
Can you create a cuboid using knowledge of what the net looks like?		
Do you know what a net for a cuboid looks like?		
Can you create a cube using knowledge of what the net looks like?		
Do you know what a net for a cube looks like?		



Year 6: Spring 2

Week 4: Measures

Recognise when it is possible to use the formulae for area & volume of shapes.

Spring 2: Week 4: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Spring 2: Week 4
Objective: Measures	Recognise when it is possible to use the formulae for area & volume of shapes.

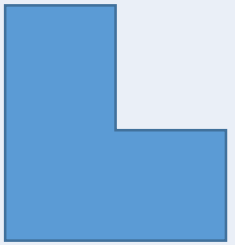
Take 16 lego bricks of the same size, as shown, and create 3 different cuboids.

Draw 3 different right angled triangles with an area of 20 sq. cm.

Which of these shapes has the biggest area?:

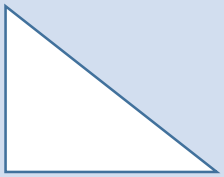
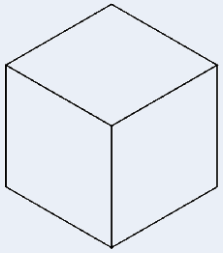
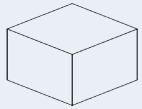
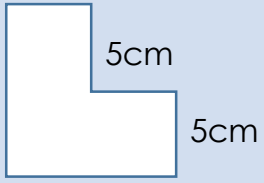
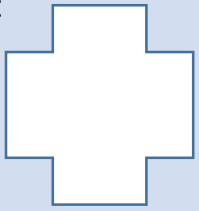
- Rectangle 12 x 8 cm
- Rectangle 10 x 9 cm
- Square with side of 8cm
- Right-angled triangle with vertical side 9cm and a base of 15 cm

The L shape is 10 cm tall and has a base of 12cm The stem of the L shape is 5 cm.
What is its area?



Spring 2: Week 4: Practice and Consolidation

Measures: Recognise when it is possible to use the formulae for area & volume of shapes.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Know when to apply a given formula to find the area of a shape ➢ Know when to apply a given formula to find the volume of a shape	• Start by reminding pupils about the formula that can be applied when finding the area of given regular 2D shapes. • Then move on to consider the volume of given regular 3D shapes. • Move on to explain how the area of irregular 2D shapes can be measured if the shape can be divided up to make smaller rectangles; squares or triangle shapes pieces. • Similarly, the volume of an irregular 3D shape can be found by looking for cubes and cuboids within the irregular shape. • Remind pupils of cubed and square symbols.	Find the area of the following shapes:  Rectangles that are: 10cms x 5cm 12cms x 6cm 20m x 5m 25m x 6m  Right-angled triangles that are: Vertical 5cm x base of 10cm Vertical 10cm x base of 10cm Vertical 8cm x base of 10cm Vertical 12cm x base of 15cm Find the volume of cubes:  With side 5cm. With side 10cm. With side 2m With side 15cm With side 20cm Find volume of cuboids:  10 x 5 x 4cm 8 x 6 x 4cm 12 x 8 x 10 metres Find the area of these 2 shapes: 10cm  5cm 5cm  Started as a 5 x 5cm square. Had 4, 1x1cm corners taken off.

Spring 2: Week 4: Mastering this Objective – Deeper Understanding

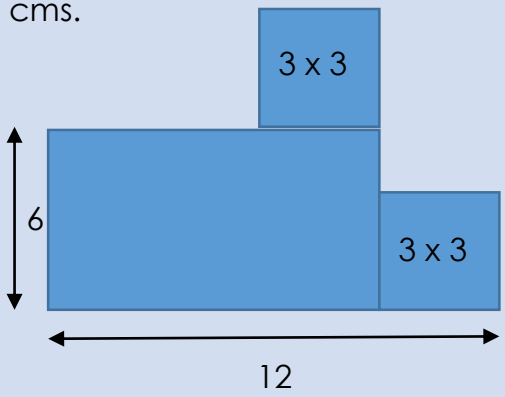
Measures: Recognise when it is possible to use the formulae for area & volume of shapes.

Teaching Sequence

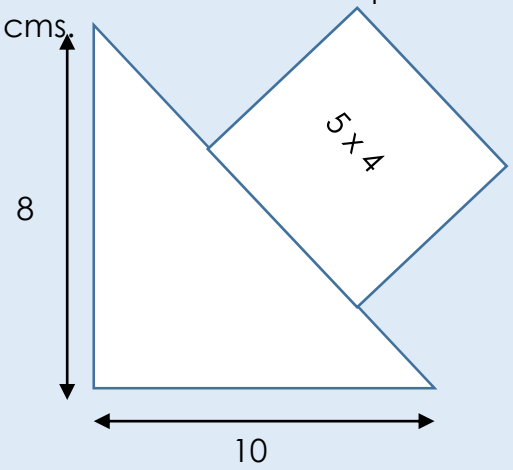
- Know when to apply a given formula to find the area of a shape
- Know when to apply a given formula to find the volume of a shape

If pupils have mastered this objective they will be able to complete these activities independently:

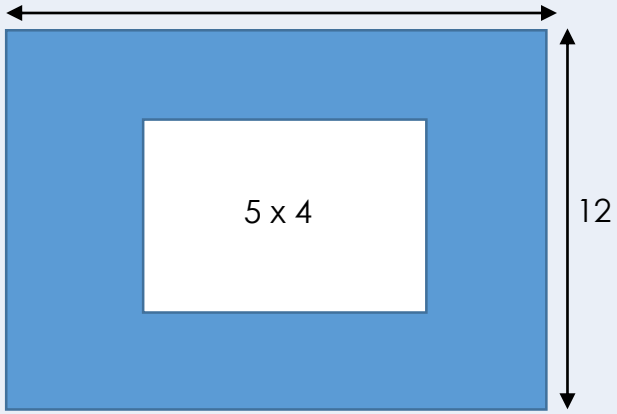
Find the area of this shape: All measures in cms.



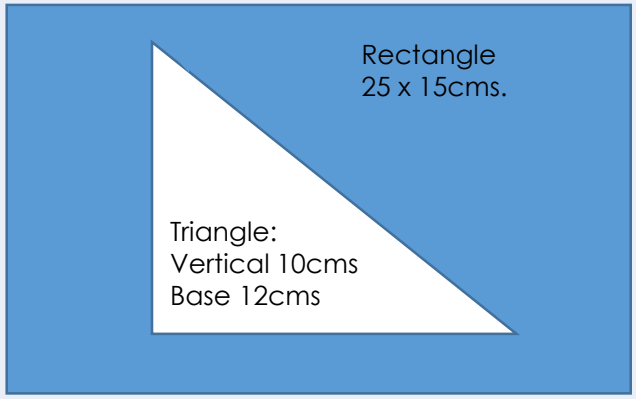
Find the area of this shape: All measures in cms.



Find the area of the darker part: All measures in cms. 15



Find the area of the darker part: All measures in cms.



Spring 2: Week 4: Working at greater depth

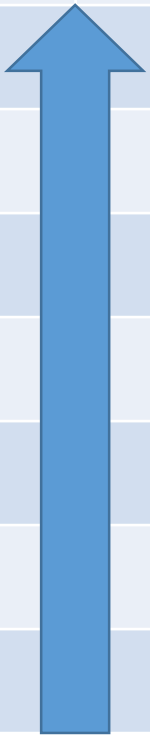
Measures: Recognise when it is possible to use the formulae for area & volume of shapes.

Teaching Sequence	Activities for pupils working at greater depth:	
➢ Know when to apply a given formula to find the area of a shape ➢ Know when to apply a given formula to find the volume of a shape	**Which has the greater volume?** Philip and Harriet were arguing about the volume of two hotels. Phil says the first has a greater volume. It has a base of 10m x 15m and has 17 floors, each being 3metres high. Harriet says the second hotel has the greater volume. It has 26 floors with each floor being 3 metres high but has a base of 8m x 6m. Which of the two is correct? Give your reasons and show your workings.	**Farmer Problem** A framer has a very large field which he needs to divide up to accommodate his sheep; cows and horses. The field is 50 metres x 72 metres. Each of the animals must have an area of at least 1000 sq. metres. Show at least one way that the large field can be divided up to ensure there is enough space for the animals and also work out how much perimeter fencing the farmer will need.
	Garage Flooring A rectangular garage measures 7 x 5 metres. And there is a passageway leading to the house. The passageway is 1 metre x 5 metres. The owner wants to put a special flooring down which costs £6.50 per sq. metre. The passageway will also have the same flooring. How much will it cost to cover the area?	**Create you own** Create 3 different L shapes (2D) with each having an area of 36 sq. cm Create 3 different X shapes (2D) with each having an area of 48 sq. cm Create 2 different irregular shapes each with an area of 40 sq. cm

Spring 2: Week 4: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Measures: Recognise when it is possible to use the formulae for area & volume of shapes.	Me	My Teacher
Do you know when it is possible to apply a formula to work the volume of an irregular 3D shape?		
Do you know when it is possible to apply a formula to work the area of an irregular 2D shape?		
Can you tell someone how to work out the volume of a cuboid?		
Can you tell someone how to work out the volume of a cube?		
Can you tell someone how to work out the area of a right-angled triangle?		
Can you tell someone how to work out the area of a rectangle?		
Can you tell someone how to work out the area of a square?		



Year 6: Spring 2

Week 5: Statistics

Interpret and construct:

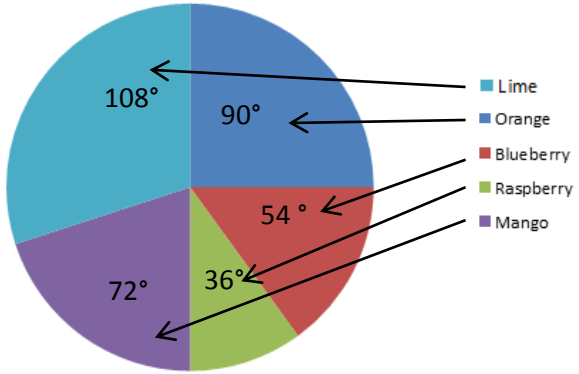
- **pie charts**
- **line graphs**

and use these to solve problems

Spring 2: Week 5: Pre-Learning Task

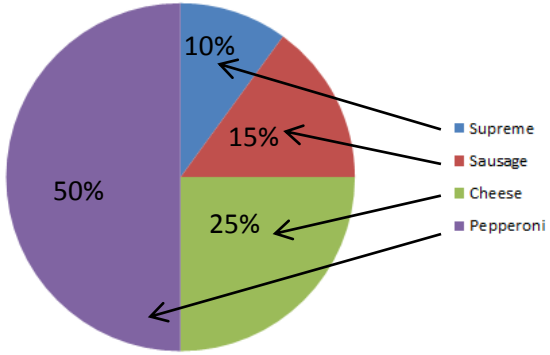
The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Spring 2: Week 5
Objective: Statistics	Interpret and construct: - pie charts - line graphs and use these to solve problems



360 children were asked which was their favourite drink.
How many preferred Lime?
How many preferred Strawberry?
How many preferred Raspberry?
How many preferred Orange?
How many preferred Blueberry?

Favourite Pizza Toppings



200 children were asked to choose their favourite pizza topping.
How many chose pepperoni?
How many more chose cheese rather than supreme?
How many chose sausage?

Spring 2: Week 5: Practice and Consolidation

Statistics: Interpret and construct: pie charts: line graphs and use these to solve problems

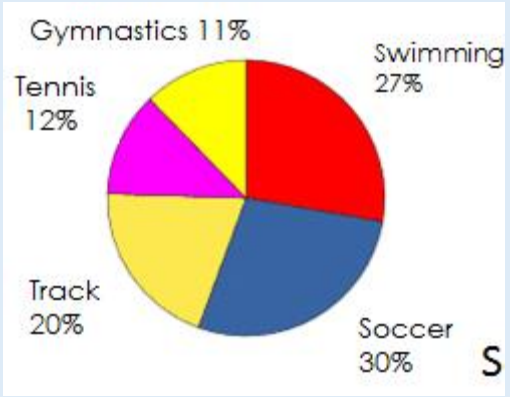
Teaching Sequence

- Know what a pie chart is
- Read a simple pie chart with segments that are divisible by 10
- Use information from pie chart to solve a problem
- Construct a pie chart from a set of given information with data in multiples of 6 or 12
- Use knowledge of angles to measure segments of pie charts accurately
- Interpret information from line graphs to answer questions
- Know how to read scales on line graphs
- Draw own line graphs with range of scales

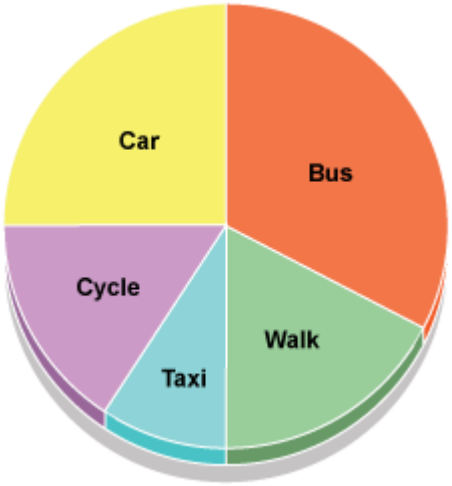
Oral and Mental Activities Examples:

- Remind pupils about the way they have collected and represented information to date, using a line and bar graphs as well as pictograms.
- Introduce the idea of a pie chart, explaining when it can be beneficial to represent information in this way.
- Talk about the segments and remind pupils about there being 360° in a circle.
- Show examples of pie charts and get pupils to work together to explain what they show.

Pencil and Paper Activities Examples:



The pie chart shows the most popular sports amongst students at an American University.
Make up at least three questions you could ask someone related to the information on this pie chart.



Look at the pie chart which shows how children get to school.
Knowing that the full circle has 360°, estimate to the nearest 5° the amounts that travel by bus; walk; taxi; cycle and by car.
If 400 children attend the school work out how many come to school in each of the five ways.

Now think of three questions you could ask related to the information contained in the pie chart.

Spring 2: Week 5: Mastering this Objective – Deeper Understanding

Statistics: Interpret and construct: pie charts: line graphs and use these to solve problems

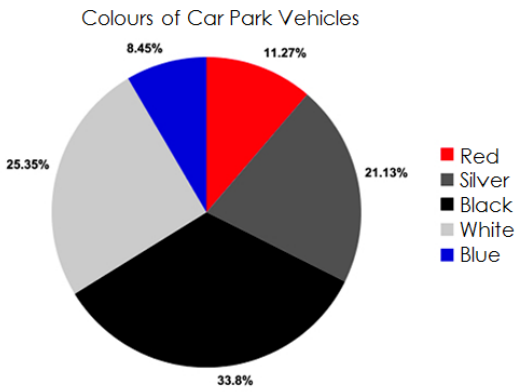
Teaching Sequence

- Know what a pie chart is
- Read a simple pie chart with segments that are divisible by 10
- Use information from pie chart to solve a problem
- Construct a pie chart from a set of given information with data in multiples of 6 or 12
- Use knowledge of angles to measure segments of pie charts accurately
- Interpret information from line graphs to answer questions
- Know how to read scales on line graphs
- Draw own line graphs with range of scales

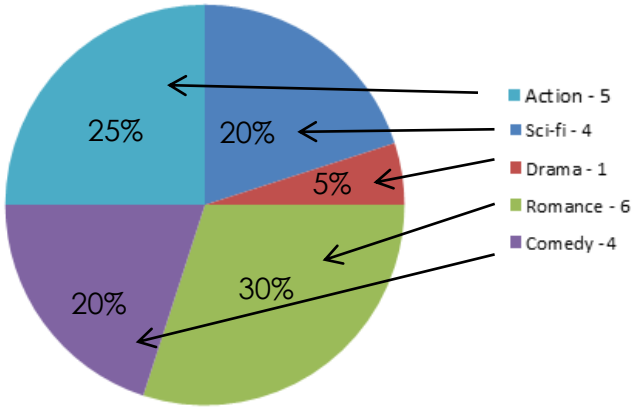
If pupils have mastered this objective they will be able to complete these activities independently:

Apple Pie and Pie Charts

Create a pie chart to show the ingredients required to make an apple pie.
Apples takes up 50% of the ingredients; Flour 20%; margarine 15%; sugar 10% and water 5%.
Set this information out on a pie chart and provide an appropriate heading as well as three questions, linked to the pie chart.



Colours of cars on the car park
Create a number of questions for your friends to answer in relation to this pie chart.



Favourite Movie

This pie chart shows the results of a class of 20 children's favourite movie.
The percentages as well as the numbers are shown.
Re-do this chart taking out the action section and allocating 2 of the 5 children in the action category to comedy; 2 to drama and 1 sci-fi.
Think of three questions you could ask related to the new pie chart you have formed.

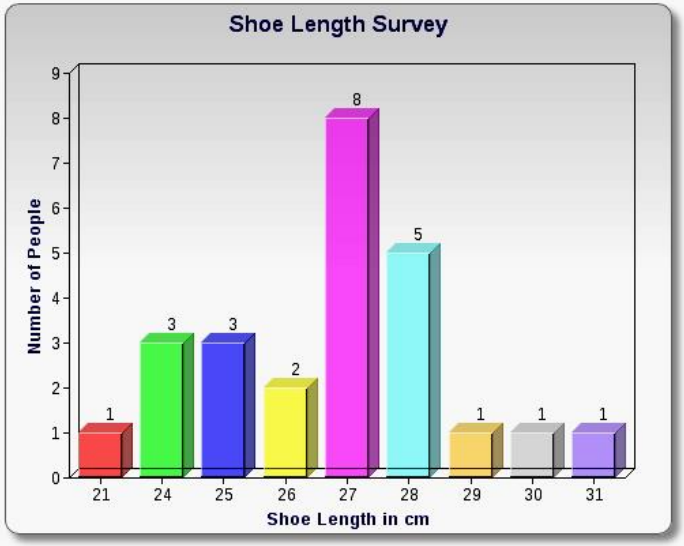
Spring 2: Week 5: Working at greater depth

Statistics: Interpret and construct: pie charts: line graphs and use these to solve problems

Teaching Sequence

- Know what a pie chart is
- Read a simple pie chart with segments that are divisible by 10
- Use information from pie chart to solve a problem
- Construct a pie chart from a set of given information with data in multiples of 6 or 12
- Use knowledge of angles to measure segments of pie charts accurately
- Interpret information from line graphs to answer questions
- Know how to read scales on line graphs
- Draw own line graphs with range of scales

Activities for pupils working at greater depth:



The information above shows the number of people that have various shoe sizes.
Create a pie chart with the same information on.
There are 25 people altogether, which means that 1 person will represent just over 14°.
When you have completed the pie chart explain which is the better graph to show the information giving reasons for your answer.

Linking Percentages and Pie charts.

At a recent election the Red party won 45% of the vote; the Yellow Party had 30% of the vote; the Brown Party had 15% of the vote; the Blue Party had 6% of the vote. The rest did not vote.
Create a pie chart to show the results.
Now create 3 questions to ask others about the pie chart created.

Collect Information

Collect information about children's favourite day of the week.
Ask 36 children.
Then present the information on a pie chart.

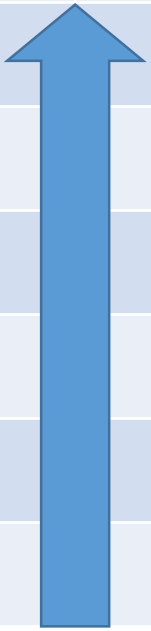
Now ask 36 adults the same question and present the information on a pie chart.

Study both the charts you have produced and then draw some conclusions from your results.

Spring 2: Week 5: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils books so that they can keep their own checks.

Statistics: Interpret and construct: pie charts: line graphs and use these to solve problems	Me	My Teacher
Can you construct your own pie charts and make decisions about the scales?		
Can you read pie charts with scales?		
Do you know when it is possible to apply a formula to work the area of a irregular shape?		
Do you know how to read, interpret and create your own line graphs?		
Do you know how to read, interpret and create your own bar charts?		
Do you know how to read, interpret and create your own pictograms?		



Year 6: Spring 2

Week 6: Consolidate and Assess

- Start this week by revising the learning covered in the Autumn and Spring terms so as to ensure pupils are fluent and secure with their basic skills.
- Use a simple assessment process to check on pupils' confidence and consistency in using the learning outlined in the Autumn and Spring terms.
- Analyse the results and use information to help focus the intervention sessions, as needed, for the following term.

Year 6: Spring 2: Week 6

The focus of the consolidation should be the following aspects:

- Count on/back from a given number in steps of 10/100/1000/10000 to 1,000,000 and beyond
- Count on/back in whole numbers, fraction and decimal sequences through zero to include negative numbers. (e.g. 2.5 or 1 ¼)
- Find 0.001, 0.01, 0.1, 1, 10 and powers of 10 more or less than a given number
- Read, write, partition, order and compare numbers to 5,000,000 and beyond
- Round any number to 5,000,000 and beyond to the nearest 10, 100, 1000, 10,000 and 100,000 (e.g. round any 6 digit number to the nearest hundred thousand and 7-digit number to the nearest million)
- Order and compare numbers including integers, decimals and negative numbers
- Read, write, order, partition and compare decimal numbers up to 3dp
- Round decimals with 3dp to the nearest whole number or to one or two decimal places
- Multiply and divide drawing upon known facts and/or using place value
- Multiply and divide any whole and decimal number by 10, 100 and 1000 giving answers up to 3dp
- Perform mental calculations with larger numbers and mental calculations which include at least 2 different operations (e.g. addition and multiplication)
- Continue a linear number sequence with positive and negative numbers, decimal and proper fractions including through zero
- Find factors and factor pairs of each number to 100
- Convert units of measurement using decimal notation up to 3dp (km and m; cm and m; cm and mm; gram and km, ml and L and time)
- Find complements to 1000, 10,000 and to £10.00, £20.00 and £50

- Although practise and consolidation should be on-going through each half term, during Week 6 there should be greater opportunity taken to check pupils' learning and understanding.
- Summative and Formative assessment procedures should help teachers gain a clear picture as to which pupils are at different stages, including mastery and greater depth.

YEAR 6: SUMMER 1: Overview and Teaching Steps

WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
3 Place Value	**3 Addition & Subtraction**	**4 Fractions**	**5 Geometry**	**1 Algebra**	**6 Measures**
Round any whole number to the required degree of accuracy	Consolidate all learning in relation to the four operations using formal efficient methods at all times	Multiply simple pairs of proper fractions, writing the answer in the simplest form.	Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.	-Express missing number problems algebraically. -Use simple formulae. -Generate and describe linear number sequences.	-Recognise that shapes with the same areas can have different perimeters and vice versa. -Calculate the area of parallelograms and triangles. -Recognise when it is possible to use formulae for area & volume of shapes.
➢ Round any 4 digit number to the nearest 1000 ➢ Round any 5 digit number to the nearest 10,000 ➢ Round any 6 digit number to the nearest 100,000 ➢ Round any 7 digit number to the nearest 1,000,000	➢ Solve problems involving numbers up to 10,000,000 ➢ Identify the best way to check answers ➢ Justify the reasonableness of the answer within the context	➢ Multiply a whole number with a fraction ➢ Multiply a whole number with a fraction and express the answer in its simplest form ➢ Multiply two simple fractions and express the answer in its simplest form ➢ Work out how to multiply two improper fractions and express the answer in its simplest form	➢ Given two angles in a triangle, calculate the missing angle ➢ Given information about angles in a quadrilateral, calculate missing angles ➢ Calculate missing angles in parallelogram, rhombus and trapezium from calculating diagonally opposite angles ➢ Calculate missing angles on a line ➢ Calculate missing angles where they are opposite	➢ Write known rules algebraically. ➢ Work out equations involving missing amounts, e.g. If 2x-1=9, what is x? ➢ Work out calculations when given value of 2 letters, e.g. What is 2a+3b if a=2 and b=5 ➢ Use rules algebraically for known relationships, e.g. p=4s for finding the perimeter of a square or Area = ½ bh ➢ Continue a linear number sequence involving positive and negative numbers ➢ Continue a linear number sequence involving fractions. ➢ Continue a linear number sequence involving decimal fractions	➢ Draw shapes with same area with different perimeters ➢ Solve problems involving area and perimeter ➢ Know formula for calculating area of triangle ➢ Calculate area of triangles ➢ Know formula for calculating area of parallelogram ➢ Calculate area of parallelograms

Year 6: Summer 1

Week 1: Place Value

Round any whole number to the required degree of accuracy

Summer 1: Week 1: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Summer 1: Week 1
Objective: Place Value	Round any whole number to the required degree of accuracy

Round the following numbers to the nearest whole			***Round the following numbers to the nearest 100***		
234.8			2367		
12.82			1209		
17.33			99.3		
11.5			123,892		
19.55			128,903		
12.49			120,500		
15.23			121,550		
19.35			321,901		

Summer 1: Week 1: Practice and Consolidation

Place Value: Round any whole number to the required degree of accuracy

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Round any 4 digit number to the nearest 1000 ➢ Round any 5 digit number to the nearest 10,000 ➢ Round any 6 digit number to the nearest 100,000 ➢ Round any 7 digit number to the nearest 1,000,000	• Much of the unit is revising previous learning by revisiting previous units. • Remind pupils of the rules associated with rounding and provide them with increasingly difficult examples to explore. • Talk with pupils about when rounding is a useful concept and when it would not be. • Ensure pupils are confident of rounding a decimal value to the nearest whole number.	Round the following numbers to the nearest whole. 11.23 17.62 189.01 1.235 17.6 15.32 90.1 87.32 127.8 4.4 23.56 8.01 Round the following numbers to the nearest 10 4527 2378 1276 1437 9871 8924 9267 9001 3294 3276 5521 6128 Round the following to the nearest 100, then 1,000 2512 2365 17623 89531 90564 154723 7823 5467 19237 62376 87290 349014 Round the following to the nearest 10,000 and then 100,000 124,901 1,246.982 2,782,923 5,923,988 9,098,786 782,992 3,783,092 5,984,091 7,902,567 9,002,701 Give an example of what the following rounded could have been (each has been rounded to the nearest 10): 11,220 23670 123460 1270 324560 1250

Summer 1: Week 1: Mastering this Objective – Deeper Understanding

Place Value: Round any whole number to the required degree of accuracy

Teaching Sequence

- Round any 4 digit number to the nearest 1000
- Round any 5 digit number to the nearest 10,000
- Round any 6 digit number to the nearest 100,000
- Round any 7 digit number to the nearest 1,000,000

If pupils have mastered this objective they will be able to complete these activities independently:

A number rounded to the nearest 100 is 4500.
What is the smallest and largest number it could have been?

A number rounded to the nearest 1000 is 62,000.
What is the smallest and largest number it could have been?

A number rounded to the nearest 10,000 is 350,000
What is the smallest and largest number it could have been?

One number rounded to the nearest 100 is 235,900 and another number rounded to the nearest 10 is 235,930.
If you look at all the possibilities for the original numbers for both, how far apart could they be at their smallest margin and how far apart could they be at their largest margin?

Now do the same for the following:
A number rounded to the nearest 1000 is 457,000 and a number rounded to the nearest 100 is 457, 600.

Explain your reasoning.

Round the numbers shown to the values shown				
	Round to nearest 10	Round to the nearest 100	Round to the nearest 1000	Round to the nearest 10,000
234,982				
134,903				
620,958				

Summer 1: Week 1: Working at greater depth

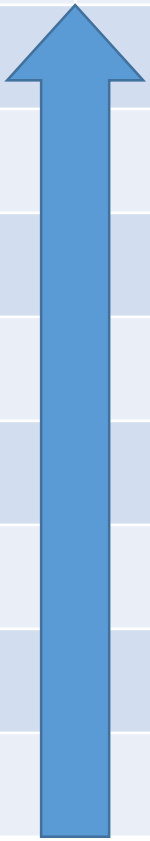
Place Value: Round any whole number to the required degree of accuracy

Teaching Sequence	Activities for pupils working at greater depth:	
➢ Round any 4 digit number to the nearest 1000 ➢ Round any 5 digit number to the nearest 10,000 ➢ Round any 6 digit number to the nearest 100,000 ➢ Round any 7 digit number to the nearest 1,000,000	**Rounds to the same** Give an example of a 6-digit number which rounds to the same number when rounded to the nearest 10,000 and 100,000. Give an example of a 7-digit number which rounds to the same number when rounded to the nearest 100,000 and 1,000,000. Give an example of a one decimal place number which rounds to the same number when rounded to the nearest whole or nearest 10.	**Finding largest and smallest after rounding** A number rounded to the nearest 10,000 is 1,230, 000. What could be the largest and what could be the smallest number? A number rounded to the nearest 100,000 is 1,600,000. What could be the largest and what could be the smallest number?
	Adding and Subtracting Rounded numbers Two rounded numbers, rounded to the nearest 1,000 add up to 52,000 and when subtracted from each other makes 2000. What are the two rounded numbers? Give an example of what the original numbers could have been before they were rounded.	**Multiplying and dividing rounded numbers** A 4-digit number rounded to the nearest 10 multiplied by a 2-digit number rounded to the nearest 10 is 87,300. When divided by the same 2-digit number the answer is 873. What were the two rounded numbers? Give an example of what the original numbers could have been before they were rounded.

Summer 1: Week 1: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Place Value: Round any whole number to the required degree of accuracy	Me	My Teacher
Given a rounded number, can you work out what the smallest and largest original number could have been?		
Given a rounded number, can you work out what the original number could have been?		
Can you round any 8-digit number to the nearest million?		
Can you round any 7-digit number to the nearest hundred thousand?		
Can you round any 6-digit number to the nearest ten thousand?		
Can you round any 5-digit number to the nearest thousand?		
Can you round a 3-digit number to the nearest 10?		
Can you round a decimal number to the nearest whole number?		



Year 6: Summer 1

Week 2: Addition, Subtraction, Multiplication & Division

Consolidate all learning in relation to the four operations using formal efficient methods at all times

Summer 1: Week 2: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Summer 1: Week 2
Objective: Addition, Subtraction	Consolidate all learning in relation to the four operations using formal efficient methods at all times

Country A has a population of 1,234, 897; Country B a population of 2,786,123 and Country C has a population of 345,897. How many people live in the 3 countries altogether?			At a factory 2,987,123 mints are produced each week. How many will be produced after 3 weeks?		
Voyager spacecraft made three journeys into space. The first journey was 1,567,987Km; the second 3,456, 094Km and the third 3,675,912. How far did Voyager travel altogether?			If 9,768,234 leaflets are produced over 5 days at a printers. How much is produced each day?		
During a civil war in an unknown country 1,267,894 people left to seek asylum elsewhere. The country originally had a population of 4,783,976. How many people were left?			A new style vehicle can travel for 885,125Km but has to change its electrical system 5 times during the journey. How far does it travel with each electrical system?		
The total attendance at City's matches this season was 4,986,012 and the total attendance at Rovers' matches was 3,872,123. How many more attended City's matches?			2,300,876 attended theatre productions in London last year. 123,457 were male. How many females attended? If each ticket cost an average of £4, how much money was taken altogether?		

Summer 1: Week 2: Practice and Consolidation

Addition, Subtraction, Multiplication & Division: Consolidate all learning in relation to the four operations using formal efficient methods at all times

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Solve problems involving numbers up to 10,000,000 ➢ Identify the best way to check answers ➢ Justify the reasonableness of the answer within the context	• The main focus in this unit is to ensure pupils are secure in their ability to tackle problems, looking for key words and also reading the problem carefully before attempting to solve it. • In addition it is an opportunity to see how effectively pupils are applying their basic skills, in context. • Note needs to be made of any one who is being hampered in their problem solving through their lack of fluency in basic number. • Help pupils to work out reasonableness as a check to find out whether their answer is plausible.	A magician earns £15,000 for each appearance he makes on a tour. If she performs for 6 days, which of these totals is closest to the amount of money she is likely to make? £50,000 £500,000 £100,000 or £1,000,000 The population of the United Kingdom has increased by 12,560,000 since 1980. The population was 52,500,000 in 1980. If the population increases by exactly the same amount over the next 25 years, how many people will be living in the United Kingdom in 25 years time? Three families won £130,000; £350,000 and £450,500 on the lottery. Each family gives a quarter of their money to charity. How much did each have left and how much did they have in total? The London Marathon raised £7,500,000 for charity last year (2016). Each year, they raise an extra £450,000. How much money will they raise in 2020? How much more will that be than in 2016? Show your workings.

Summer 1: Week 2: Mastering this Objective – Deeper Understanding

Addition, Subtraction, Multiplication & Division: Consolidate all learning in relation to the four operations using formal efficient methods at all times

Teaching Sequence

- Solve problems involving numbers up to 10,000,000
- Identify the best way to check answers
- Justify the reasonableness of the answer within the context

If pupils have mastered this objective they will be able to complete these activities independently:

During the first 6 matches in a football season, Rovers sold between 50,000 and 52,000 tickets.
Each person paid £25 for their ticket.

Which of the following amounts is the most sensible estimate of the amount of money they made from tickets they sold?

£10,000,000 £7,500,000 £750,000
Explain your reasoning

250,000 people buy season tickets for the National Trust. This means they can go into places free of charge. Each season ticket costs £105.
As well as the season ticket holders, 1,300,000 adults visited National Trust events during the year. Each adult paid £25 for their ticket. In addition, 230,000 children visited National Trust events. They paid £12 each for their tickets.
How much money did the National Trust receive in total?

Over a period of one year a pizza company has the following sales:

Vegetarian	Chicken	Pepperoni
235,789	342,901	523,786

How many sales were there altogether?
How many more pepperoni pizza sales were there compared with chicken pizza sales?
How many more chicken pizza sales were there compared with vegetarian pizza?

For 6 consecutive seasons, 415,895 fans attended the hockey matches for a Birmingham club each year.
Each fan paid £2.50 for each ticket.
How many fans attended altogether in the 6 years?
How much money did they pay for attending the matches over a period of 6 years?
Think of two ways you could work out much money the fans paid in total.

Summer 1: Week 2: Working at greater depth

Addition, Subtraction, Multiplication & Division: Consolidate all learning in relation to the four operations using formal efficient methods at all times

Teaching Sequence

- Solve problems involving numbers up to 10,000,000
- Identify the best way to check answers
- Justify the reasonableness of the answer within the context

Activities for pupils working at greater depth:

Below there is a 3 x 3 matrix.
Put in the numbers 1 to 9 in each square and only use the numbers once.
Make up six 3-digit numbers by putting together each horizontal and each vertical line's numbers as shown below.

Example						
6	1	3				
9	5	7				
2	8	4				

613 + 957 + 284 + 692 + 158 + 374 = 3,078

Organise your matrix so that when added together your six 3-digit numbers add up to more than 4000.
Now organise your matrix so that when added together your six 3-digit numbers add up to less than 3000.
Think of other combinations.

At a national election the three main parties polled the following votes in five different towns:

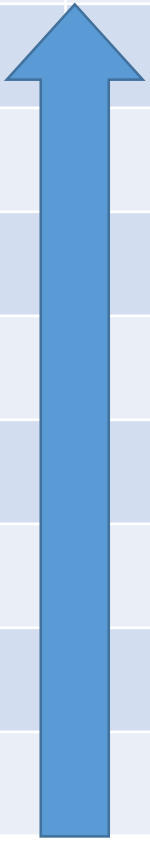
	Blue Party	Red Party	Pink Party
Town A	12,347	14,892	8,929
Town B	15,982	909	12,345
Town C	13,567	11,902	23,011
Town D	15,427	15,609	14,567
Town E	12,982	19.347	9,001

Who won the election?
What was the difference between the Party with most votes and the Party with least votes?
If you focus on each town, where was there the greatest difference between the most popular Party and the least popular Party?

Summer 1: Week 2: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Addition, Subtraction, Multiplication & Division: Consolidate all learning in relation to the four operations using formal efficient methods at all times	Me	My Teacher
Do you, as a matter of course, check the reasonableness of your answer?		
Can you solve word problems with mixed operations with numbers up to 10,000,000?		
Can you solve word problems involving division with numbers up to 10,000,000?		
Can you solve word problems involving multiplication with numbers up to 10,000,000?		
Can you solve word problems involving subtraction with numbers up to 10,000,000?		
Can you solve word problems involving addition with numbers up to 10,000,000?		
Do you work out an approximate answer before tackling a problem?		
Do you consistently read problems carefully and look for key words before attempting to solve it?		



Year 6: Summer 1

Week 3: Fractions

Multiply simple pairs of proper fractions, writing the answer in the simplest form.

Summer 1: Week 3: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Summer 1: Week 3
Objective: Fractions	Multiply simple pairs of proper fractions, writing the answer in the simplest form.

Turn these fractions into mixed fractions:

$\frac{5}{2}$  $\frac{6}{5}$ 

$\frac{7}{4}$  $\frac{9}{4}$ 

Calculate these multiplications:

$\frac{2}{3} \times \frac{5}{6}$

$\frac{8}{9} \times \frac{3}{4}$

Calculate these multiplications:

$\frac{1}{4} \times \frac{3}{4}$

$\frac{5}{6} \times \frac{3}{4}$

$\frac{1}{5} \times \frac{4}{5}$

$\frac{2}{3} \times \frac{6}{7}$

$\frac{5}{6} \times \frac{3}{4}$

Summer 1: Week 3: Practice and Consolidation

Fractions: Multiply simple pairs of proper fractions, writing the answer in the simplest form.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Multiply a whole number with a fraction ➢ Multiply a whole number with a fraction and express the answer in its simplest form ➢ Multiply two simple fractions and express the answer in its simplest form ➢ Work out how to multiply two improper fractions and express the answer in its simplest form	• Remind pupils about what is meant by the term simplest form. • Move on to multiply whole numbers by a fraction. • Then move on to help pupils multiply two fractional values. • Eventually help pupils to multiply two mixed fraction values. • Remind pupils of the terms: improper fraction; mixed fractions and proper fractions.	Reduce the following fractions to their simplest form: $\frac{8}{12}$ $\frac{3}{9}$ $\frac{16}{20}$ $\frac{24}{36}$ $\frac{21}{28}$ $\frac{10}{50}$ $\frac{5}{15}$ $\frac{8}{24}$ Turn these improper fraction into mixed fractions: $\frac{15}{4}$ $\frac{21}{5}$ $\frac{32}{6}$ $\frac{9}{2}$ $\frac{11}{5}$ $\frac{18}{4}$ $\frac{27}{3}$ $\frac{19}{8}$ $\frac{43}{11}$ Multiply a whole number by a fraction: $3 \times \frac{4}{5}$ $7 \times \frac{5}{6}$ $8 \times \frac{7}{8}$ $9 \times \frac{1}{3}$ Multiply one fraction by another: $\frac{2}{3} \times \frac{4}{5}$ $\frac{3}{4} \times \frac{1}{3}$ $\frac{7}{8} \times \frac{2}{3}$ $\frac{1}{4} \times \frac{2}{3}$ Multiply these two improper fractions and express the answer in its simplest form: $\frac{12}{5} \times \frac{14}{3}$ $\frac{23}{7} \times \frac{12}{5}$ $\frac{15}{6} \times \frac{8}{5}$ $\frac{23}{7} \times \frac{11}{4}$

Summer 1: Week 3: Mastering this Objective – Deeper Understanding

Fractions: Multiply simple pairs of proper fractions, writing the answer in the simplest form.

Teaching Sequence

- Multiply a whole number with a fraction
- Multiply a whole number with a fraction and express the answer in its simplest form
- Multiply two simple fractions and express the answer in its simplest form
- Work out how to multiply two improper fractions and express the answer in its simplest form

If pupils have mastered this objective they will be able to complete these activities independently:

Replace each of the boxes with a whole number less than 20, so that the number sentence makes sense.

$\frac{2}{\square} \times \frac{3}{\square} = \frac{\square}{\square}$

$\frac{\square}{\square} \times \frac{\square}{\square} = \frac{7}{8}$

$\frac{2}{\square} \times \frac{3}{\square} < \frac{3}{4}$

$\frac{1}{\square} \times \frac{\square}{\square} = \frac{2}{3}$

What is ¼ of 10½Km?

What is 1/3rd of 4 litres?

What is ¾ of £35.90?

What is ⅜ of £56.80?

What is ⅞ of 4¼ litres?

What is 3/10th of 8¾Km?

Rachel shares 6 oranges between some friends. Each one gets ⅜. How many people had a share?

Henry shares 8 pizzas between his friends. Each one gets ⅛. How many people had a share?

Miriam shares 9 apple pies between her friends. Each one gets ¾. How many people had a share?

Multiply each of the whole numbers on the left with each of the fractions on the right:

6	⅞
8	¾
10	⅝
7	½

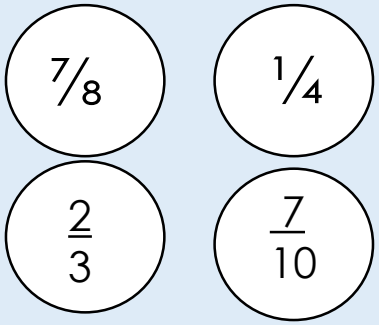
Summer 1: Week 3: Working at greater depth

Fractions: Multiply simple pairs of proper fractions, writing the answer in the simplest form.

Teaching Sequence

- Multiply a whole number with a fraction
- Multiply a whole number with a fraction and express the answer in its simplest form
- Multiply two simple fractions and express the answer in its simplest form
- Work out how to multiply two improper fractions and express the answer in its simplest form

Activities for pupils working at greater depth:



Which two fractions multiplied together give you the highest value? Which gives you the smallest value?

Which of the following fractions can you multiply so that the answer is greater than 5?

4 $\frac{5}{7}$ **6** $\frac{4}{5}$ **8** $\frac{3}{4}$ $\frac{2}{3}$ $\frac{3}{5}$ $\frac{7}{9}$ $\frac{9}{10}$ $\frac{11}{12}$

Set out at least 5 pairs of mixed or simple fractions where when multiplied the answer is above 5.

Now do the same for where the answer is above 7; this time have 3 pairs.

x	1/8	3/8	5/8	7/8
1¼				
2¼				
3¼				
4¼				

What do you notice when you complete the table to the left?

Find a pair of mixed numbers that when multiplied gives an answer of between 5 and 5½.

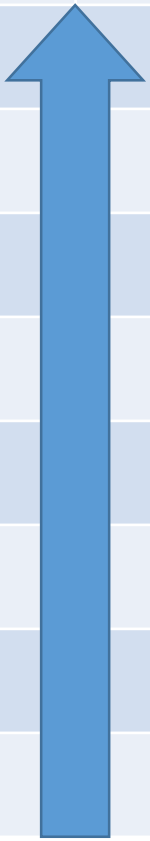
Find a pair of simple fractions that when multiplied gives an answer of between ½ and ¾.

Find a pair of mixed numbers that when multiplied gives an answer of between 10 and 10½.

Summer 1: Week 3: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Fractions: Multiply simple pairs of proper fractions, writing the answer in the simplest form.	Me	My Teacher
Can you multiply two improper fractions and express the answer in its simplest form?		
Can you multiply two improper fractions?		
Can you multiply two fractions together and express the answer in its simplest form?		
Can you multiply two fractions together?		
Can you multiply a whole number by a fraction and express the answer in its simplest form?		
Can you multiply a whole number by a fraction?		
Can you write an improper fraction as a mixed number?		
Can you reduce any fraction to its simplest form?		



Year 6: Summer 1

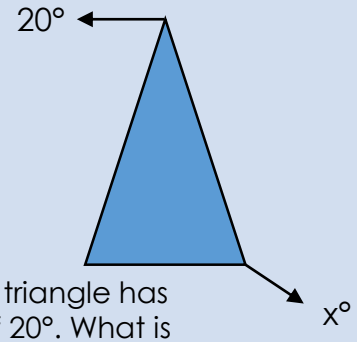
Week 4: Geometry

Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

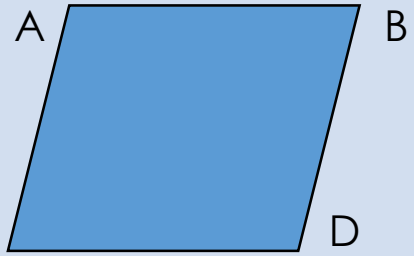
Summer 1: Week 4: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

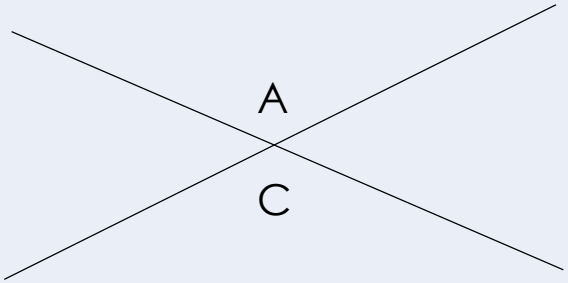
Name	Summer 1: Week 4
Objective: Geometry	Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.



This isosceles triangle has one angle of 20°. What is angle x?

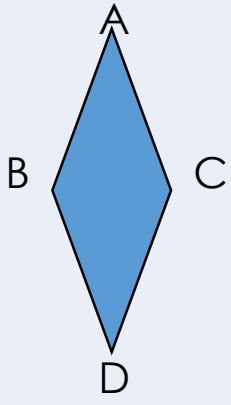


The angle at A is 100°. What is the angle at B, C and D?



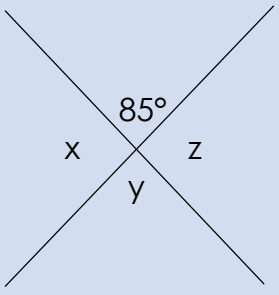
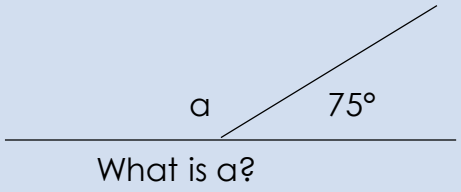
If angle A = 105°, what is angle C?

If the angle at A is 25°. What is angle D? Now work out angles B and C.



Summer 1: Week 4: Practice and Consolidation

Geometry: Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Given two angles in a triangle, calculate the missing angle ➢ Given information about angles in a quadrilateral, calculate missing angles ➢ Calculate missing angles in parallelogram, rhombus and trapezium from calculating diagonally opposite angles ➢ Calculate missing angles on a line ➢ Calculate missing angles where they are opposite	• Remind pupils about the sum of the three angles in a triangle and about the sum of the four angles in a quadrilateral. • Make sure they are measuring accurately using protractors. • Pupils should be able to estimate what a 30°; 60° and a 45° angle look like. • Remind pupils of which angles are the same in various formations such as two lines that cross; a line joining two parallel lines, etc.	Find the third angle of each of these triangles: • A right angled triangle with another angle being 35°; what is the third angle? • An isosceles triangle with the third angle being 68°; what is the angle of the other two (both the same)? • A triangle with angles of 65° and 35°; what is the third angle? Find the missing angles in these quadrilaterals: • A parallelogram with two angles of 105°. What are the other two angles? • A trapezium where two of the angles are 70°; what are the other two angles? • A quadrilateral with angles of 65°; 105° and 75°; what is the fourth angle? Find the missing angles:  What is x, y and z?  What is a?

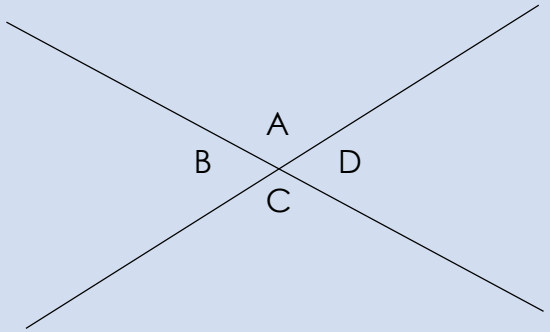
Summer 1: Week 4: Mastering this Objective – Deeper Understanding

Geometry: Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

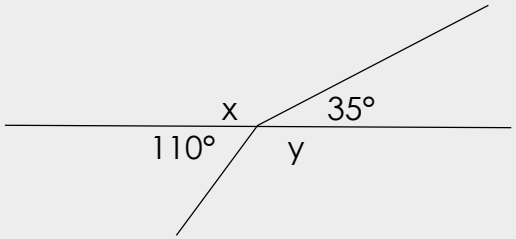
Teaching Sequence

- Given two angles in a triangle, calculate the missing angle
- Given information about angles in a quadrilateral, calculate missing angles
- Calculate missing angles in parallelogram, rhombus and trapezium from calculating diagonally opposite angles
- Calculate missing angles on a line
- Calculate missing angles where they are opposite

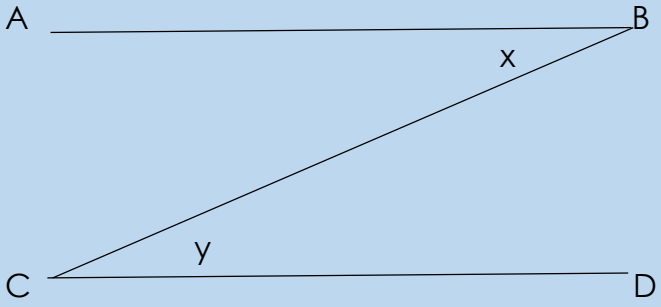
If pupils have mastered this objective they will be able to complete these activities independently:



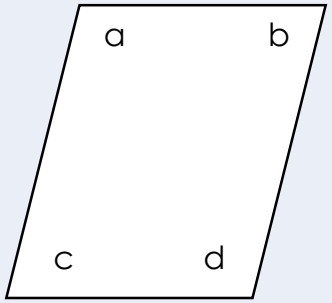
If angle A = 95°. What is angle B, C and D?



What is x and what is y?



If line AB is parallel to line CD and Angle x = 35°. What is angle y?



If a = 100°; work out what b, c and d are. What if a = 110°; work out what b, c and d are.

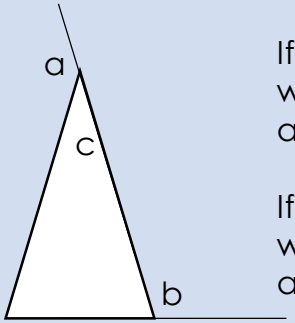
Summer 1: Week 4: Working at greater depth

Geometry: Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

Teaching Sequence

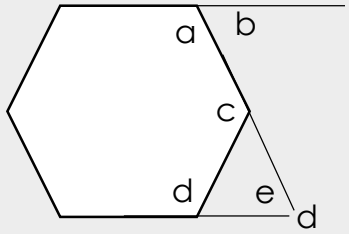
- Given two angles in a triangle, calculate the missing angle
- Given information about angles in a quadrilateral, calculate missing angles
- Calculate missing angles in parallelogram, rhombus and trapezium from calculating diagonally opposite angles
- Calculate missing angles on a line
- Calculate missing angles where they are opposite

Activities for pupils working at greater depth:



If angle a = 36°; what are angle a and b?

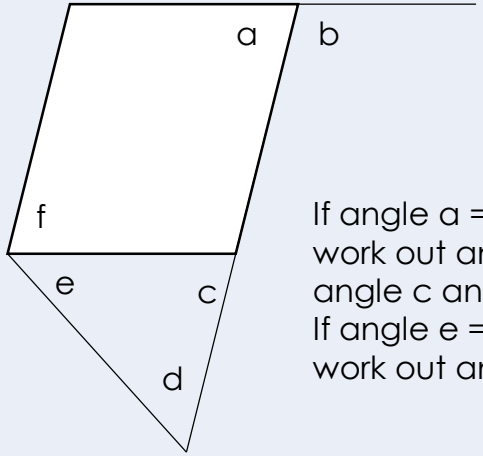
If angle a = 32°; what are angle a and b?



If angles a, c and d = 120°
What is angle b?
What is angle e?

If the internal angles of a triangle add up to 180° and the internal angles of a quadrilateral add up to 360°; work out what the internal angles of a pentagon and a hexagon add up to.
Now complete this table:

	Sum of internal angles
pentagon	
hexagon	
heptagon	
octagon	

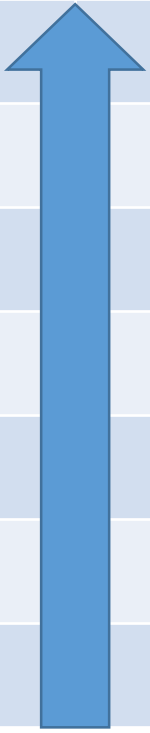


If angle a = 75° work out angle b, angle c and angle f.
If angle e = 45° work out angle d.

Summer 1: Week 4: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Geometry: Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.	Me	My Teacher
Can you work out what the sum of the internal angles of a pentagon; hexagon and octagon are?		
Given one angle on two intersecting lines, can you find the other three?		
Given one angle of a trapezium, can you find the other three?		
Given one angle of a parallelogram, can you find the other three?		
Given three angles of a quadrilateral, can you find the fourth?		
Given one angle of an isosceles triangle, can you work out what the other angles are?		
Given 2 angles of a triangle, can you work out what the third one is?		



Year 6: Summer 1

Week 5: Algebra

-Express missing number problems algebraically.
-Use simple formulae.
-Generate and describe linear number sequences.

Summer 1: Week 5: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Summer 1: Week 5
Objective: Algebra	-Express missing number problems algebraically. -Use simple formulae. -Generate and describe linear number sequences.

Find the value of a in the following;			***Find the value of b in the following:***		
a = 12 + 43			42 + b = 80 - 25		
a + 17 = 40			20b = 60		
15 – 7 = a			10b ÷ 5 = 10		
65 – a = 35			27 + b = 59		
2a = 16			27 + 2b = 55		
2a + 5 = 25			3b + 10 = 100		
3a – 8 = 4			15b + 10 = 160		
2a – 80 = 20			90 = b ÷ 2		

Summer 1: Week 5: Practice and Consolidation

Algebra: -Express missing number problems algebraically.
-Use simple formulae.
-Generate and describe linear number sequences.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Write known rules algebraically. ➢ Work out equations involving missing amounts, e.g. If 2x-1=9, what is x? ➢ Work out calculations when given value of 2 letters, e.g. What is 2a+3b if a=2 and b=5 ➢ Use rules algebraically for known relationships, e.g. p=4s for finding the perimeter of a square or Area = ½ bh ➢ Continue a linear number sequence involving positive and negative numbers. ➢ Continue a linear number sequence involving fractions. ➢ Continue a linear number sequence involving decimal fractions.	• The area of a square could be written as a = s x s or a = s^2 • The perimeter of a rectangle could be written as p = 2lb. • Help pupils gain a deeper understanding of setting up equations in this form. • Help pupils to understand that 2a in this context is 2 x a.	What is a in the following equation: 2 + a = 6 7 – a = 6 2a + 7 = 27 3a – 8 = 20 9 – a = 7 11+ a = 16 4a + 6 = 80 5a – 8 = 22 19 – 2a = 15 23 + 5a = 33 7a + 6 – 2a = 19 What is b in the following equations: 7b = 49 8b = 56 11b + 7 = 29 41b = 123 10b = 75 8b = 20 6b = 39 7b = 91 8b = 88 If a = 5 and b = 7; Work out the following equations: 2a + 3b = ☐ 5a – 6b = ☐ 8a + 6b = ☐ 5a x 2b = ☐ 2b - ☐ = 9 7a - ☐ = 14 There are 32 children in David's class. 14 are boys. Write an equation that shows how many girls there are in the class. Use x to represent how many girls there are. Harry saves £5 each month. Write an equation that shows how long it would take him to save £100. Use the letter x to represent the number of months.

Summer 1: Week 5: Mastering this Objective – Deeper Understanding

Algebra: -Express missing number problems algebraically.
-Use simple formulae.
-Generate and describe linear number sequences.

Teaching Sequence	If pupils have mastered this objective they will be able to complete these activities independently:	
➢ Write known rules algebraically. ➢ Work out equations involving missing amounts, e.g. If 2x-1=9, what is x? ➢ Work out calculations when given value of 2 letters, e.g. What is 2a+3b if a=2 and b=5 ➢ Use rules algebraically for known relationships, e.g. p=4s for finding the perimeter of a square or Area = ½ bh ➢ Continue a linear number sequence involving positive and negative numbers. ➢ Continue a linear number sequence involving fractions. ➢ Continue a linear number sequence involving decimal fractions.	Jemma is 5 years older than Henry. Write an equation that shows how old Jemma is when Henry is 16 years old. Use x to represent Henry's age. Donna's mother is 26 years old when Donna is born. Write an equation which shows how old Donna will be when her mother is 38. Now, using the same equation layout, work out how old Donna will be when her mother will be 45; 52 and 65.	p and q are both whole numbers. p + q = 1000 and p is 150 greater than q. Work out the values of p and q. a and b are both whole numbers. a – b = 525 and a is twice the value of b. Work out the values of a and b. x and y are both whole numbers xy = 500 and x is five times the value of y. Work out the values of x and y.
	A bucket weighs 8 kilograms when full of water, and it weighs 4.8 kilograms when half full of water. What does the bucket weigh? What does it weigh when it is a quarter full of water? 	On the first day of the month Danny already had 65p in his bank account. On every day of the month, including the 1st he saves 30p to add to his account. How much did he have on the 31st of the month? Write a statement (algebraically) that shows this.

Summer 1: Week 5: Working at greater depth

Algebra: -Express missing number problems algebraically.
-Use simple formulae.
-Generate and describe linear number sequences.

Teaching Sequence

- Write known rules algebraically.
- Work out equations involving missing amounts, e.g. If 2x-1=9, what is x?
- Work out calculations when given value of 2 letters, e.g. What is 2a+3b if a=2 and b=5
- Use rules algebraically for known relationships, e.g. p=4s for finding the perimeter of a square or Area = ½ bh
- Continue a linear number sequence involving positive and negative numbers.
- Continue a linear number sequence involving fractions.
- Continue a linear number sequence involving decimal fractions.

Activities for pupils working at greater depth:

The first number in a sequence
8n + 4 is 12.
The second number in a sequence
8n + 4 is 20.
What is the 10th number in the sequence?

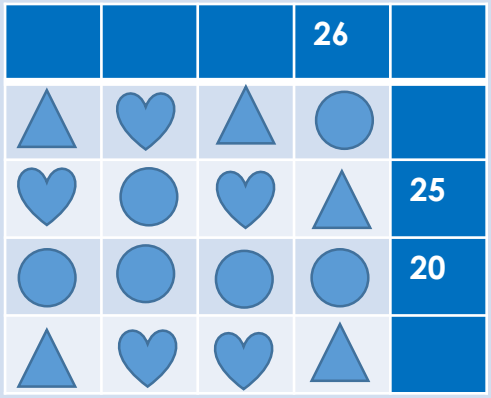
The third number in the sequence
7n – 6 is 15.
The fifth number in the sequence
7n – 6 is 29.
What are the 1st and 10th numbers in the sequence?

Hamid is married to Aysha and they have a son Asif.
Hamid is four years older than Aysha.
Aysha was 28 years old when Asif was born.
The total age of all three is 96.

How old is Asif?

How old is Aysha?

Each shape stands for a number.



The numbers shown are the totals for the line of four numbers in a row or column.
Find the remaining totals.

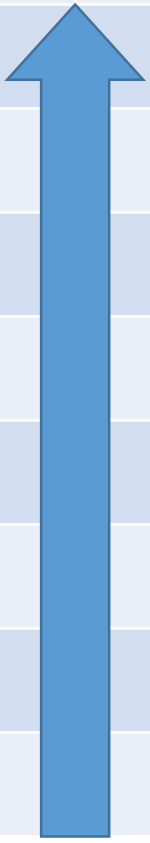
The diagram below represents two rectangular fields (A and B) that are next to each other:

Field A is twice as long as field B but their widths are the same - 7.6 metres.
If the perimeter of the small field is 23m, what is the perimeter of the entire shape containing both fields?

Summer 1: Week 5: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Algebra: -Express missing number problems algebraically. -Use simple formulae. -Generate and describe linear number sequences.	Me	My Teacher
Can you solve problems which require you to think algebraically?		
Can you use rules algebraically for known relationships, e.g. p=4s for finding the perimeter of a square?		
Can you work out calculations when given value of 2 letters, e.g. What is 2a+3b if a=2 and b=5?		
Can you work out equations involving missing amounts, e.g. If 2x-1=9, what is x?		
Do you know that the expression 2a means 2 times the value of a?		
Can you find a missing number in an equation involving subtraction?		
Can you find a missing number in an equation involving addition?		
Can you explain what an equation is?		



Year 6: Summer 1

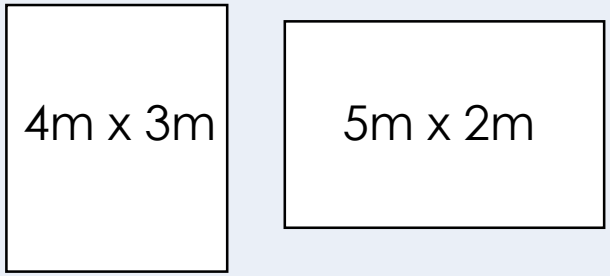
Week 6: Measures

-Recognise that shapes with the same areas can have different perimeters and vice versa.
-Calculate the area of parallelograms and triangles.
-Recognise when it is possible to use formulae for area & volume of shapes.

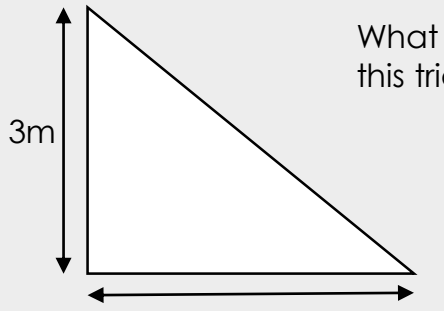
Summer 1: Week 6: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Summer 1: Week 6
Objective: Measures	-Recognise that shapes with the same areas can have different perimeters and vice versa. -Calculate the area of parallelograms and triangles. -Recognise when it is possible to use formulae for area & volume of shapes.



Which of these 2 shapes has the greatest perimeter?



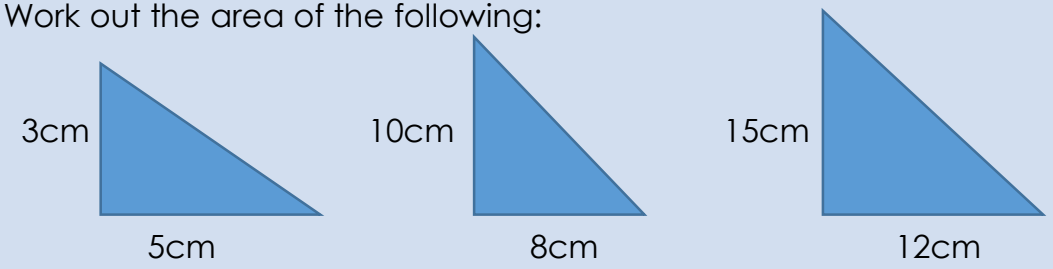
What is the area of this triangle?

What is the area of this parallelogram?

Draw a rectangle that has an area of 24sq cm and a perimeter of 22cm.

Summer 1: Week 6: Practice and Consolidation

Measures: -Recognise that shapes with the same areas can have different perimeters and vice versa. Calculate the area of parallelograms and triangles. Recognise when it is possible to use formulae for area & volume of shapes.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Draw shapes with same area with different perimeters ➢ Solve problems involving area and perimeter ➢ Know formula for calculating area of triangle ➢ Calculate area of triangles ➢ Know formula for calculating area of parallelogram ➢ Calculate area of parallelograms	• Use 2 rectangular shapes that are different but have the same area, eg, 6 x 4 and 8 x 3 • Use this to show how the perimeters are different and therefore emphasise that a shape could have the same area as another shape but they may have a different perimeter and vice versa. • Reinforce the formula for working out the area of a triangle and a parallelogram.	Draw two rectangles that have an area of 36sq. cm but have a different perimeter. State what the perimeter of each is. Draw two rectangles that have an area of 48sq. cm but have a different perimeter. State what the perimeter of each is. In a field that is 30m x 25m a framer is a able to keep 1 sheep for every 5sq m. How many sheep can he keep in the field? In another field which is 60m x 30m he keeps his cows. Cows needs 10sq. m each. How many cows can he keep in this larger field? If the area of a square is the base x the vertical side ÷ 2. Work out the area of the following: 

Summer 1: Week 6: Mastering this Objective – Deeper Understanding

Measures: -Recognise that shapes with the same areas can have different perimeters and vice versa. Calculate the area of parallelograms and triangles. Recognise when it is possible to use formulae for area & volume of shapes.=

Teaching Sequence

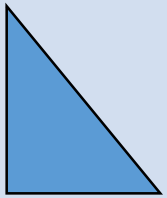
- Draw shapes with same area with different perimeters
- Solve problems involving area and perimeter
- Know formula for calculating area of triangle
- Calculate area of triangles
- Know formula for calculating area of parallelogram
- Calculate area of parallelograms

If pupils have mastered this objective they will be able to complete these activities independently:

Draw any parallelogram that has an area of 80sq. cms with the length between one set of parallel lines being 8cms.

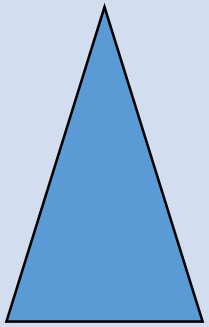
Draw any parallelogram that has an area of 20sq. cms with the length between one set of parallel lines being 4cms.

A right angled triangle has a base of 10cms and a vertical side of 15cms. What is its area?



An isosceles triangle has a base of 10cm and a height of 15cm What is its area?

An isosceles triangle has a base of 12cm and a height of 18cm What is its area?



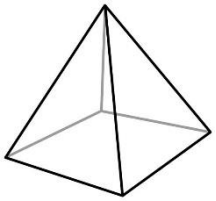
		Length			
		5m	6m	7m	8m
Breadth	2m				
	3m				
	4m				
	5m				

		Length			
		5m	6m	7m	8m
Breadth	2m				
	3m				
	4m				
	5m				

On the table to the furthest left work out the area of each rectangle.
On the table next to it work out the perimeter of each rectangle.

Summer 1: Week 6: Working at greater depth

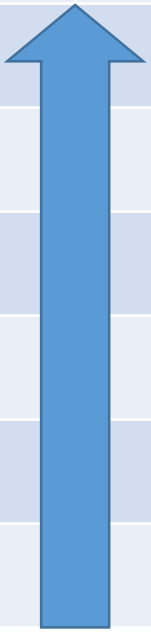
Measures: -Recognise that shapes with the same areas can have different perimeters and vice versa. Calculate the area of parallelograms and triangles. Recognise when it is possible to use formulae for area & volume of shapes.

Teaching Sequence	Activities for pupils working at greater depth:	
➢ Draw shapes with same area with different perimeters ➢ Solve problems involving area and perimeter ➢ Know formula for calculating area of triangle ➢ Calculate area of triangles ➢ Know formula for calculating area of parallelogram ➢ Calculate area of parallelograms	A rectangle has an area of 54 sq. cm. and a perimeter of 30cm. Draw the rectangle. A rectangle has an area of 216 sq. cm and a perimeter of 60cm Draw the rectangle. Draw any right-angled triangle that has an area of 60sq.cm	A farmer has 60 metres of perimeter fencing. For every 1sq m he can keep 1 chicken. How can he arrange his fence so that the enclosed area gives him the greatest area? For every 5sq. m he can keep a cow. How many cows could he keep in the fenced area?
	 A square-based pyramid building has to be covered in glass. Each of the 4 sides of the pyramid has a base of 15 metres and the measurement from the tip to the centre of the base is 20 metres. The glass costs £5.50 per sq. metre. How much will it be to cover the pyramid?	A farmer makes £5 a day from a cow's milk; £2 a day from a sheep's wool and £1 a day from a chicken's eggs. He has 120 metres of special fencing which he can use to enclose a meadow. He wants to make the largest possible area. He can keep 1 chicken in every 1sq m; 1 sheep in every 5 sq. m; and 1 cow in every 10sq.m. Which of the three animals will give him the greatest income?

Summer 1: Week 6: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Measures: -Recognise that shapes with the same areas can have different perimeters and vice versa. Calculate the area of parallelograms and triangles. Recognise when it is possible to use formulae for area & volume of shapes.	Me	My Teacher
Do you know the formula for working out the area of a parallelogram?		
Do you know the formula for working out the area of a right-angled or an isosceles triangle?		
Can you solve problems related to area and perimeter?		
Can you find out two rectangles that may have the same perimeter but a different area?		
Do you know how to work out the perimeter of a given square or rectangle?		
Do you know how to work out the area of a given square or rectangle?		



YEAR 6 : SUMMER 2: Overview and Teaching Steps

WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
2 Algebra	**4 Addition & Subtraction**	**5 Fractions**	**2 Statistics**	**6 Geometry**	**Consolidate and Assess**
-Find pairs of numbers that satisfy number sentences with two unknowns. -Enumerate all possibilities of combinations of two variables.	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.	-Divide proper fractions by whole numbers. -Use written division methods where the answer has up to two decimal places. -Associate a fraction with division to calculate decimal fraction equivalents, for simple fractions	Calculate and interpret the mean as an average	Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.	Start this week by revising the learning covered in Year 6 so as to ensure pupils are fluent and secure with their basic skills. Use a simple assessment process to check on pupils' confidence and consistency in using the learning outlined in Year 6. Analyse the results and use information to help focus the intervention sessions, as needed, for the following term.
➢ Use known facts to calculate, if 17 + x + y = 42, use known number facts to calculate possible values for x and y. ➢ Use known facts to complete a table, e.g. 'The brown string is 9cm less than 2 times as long as the yellow string'. So… if y=5, s =?	Revise: ➢ Using all 4 operations ➢ Calculating a problem using at least 2 operations ➢ Calculating 2-step problems ➢ Explaining the order to solve calculations ➢ Solving calculations in correct order	➢ Divide a proper fraction by a whole number. ➢ Divide a proper fraction by a whole number and give the answer in its simples form. ➢ Know that 1/10 can be represented as 0.1 ➢ Know that 1/5 can be represented at 0.2 ➢ Know that ¼ can be represented as 0.25 ➢ Know that ½ can be represented as 0.5 ➢ Know that ¾ can be represented as 0.75 ➢ Calculate decimal fraction equivalent for all fractional values where the denominator is 3, 4, 5, 6, 8 or 10	➢ Know the term mean is the average ➢ Find the mean of a given set of numbers	➢ Know that the line across the centre of a circle is known as the diameter ➢ Know that the distance from the centre of a circle to the arc of the circle is the radius ➢ Know the distance around the outside of the circle is called the circumference ➢ Know the diameter of the circle is twice the radius	

Year 6: Summer 2

Week 1: Algebra

-Find pairs of numbers that satisfy number sentences with two unknowns.
-Enumerate all possibilities of combinations of two variables.

Summer 2: Week 1: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Summer 2: Week 1
Objective: Algebra	-Find pairs of numbers that satisfy number sentences with two unknowns. -Enumerate all possibilities of combinations of two variables.

Find the value of a			***If a = 3 and b = 5:***		
$2a - 5 = 13$			$5a - 2b =$		
$3a - 2a = 5$			$7a - b =$		
$a^2 + 1 = 26$			$7a + 3b =$		
$(17 - a) + 5 = 9$			$9a + 5b =$		
$4a - 8 = 32$			$11a + 5b =$		

Summer 2: Week 1: Practice and Consolidation

Algebra: -Find pairs of numbers that satisfy number sentences with two unknowns.
-Enumerate all possibilities of combinations of two variables.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Use known facts to calculate, if 17 + x + y = 42, use known number facts to calculate possible values for x and y. ➢ Use known facts to complete a table, e.g. 'The brown string is 9cm less than 2 times as long as the yellow string'. So… if y=5, s =?	• This unit naturally follows on from Summer 1: Week 5. • Start with a quick revision of the main learning from that unit and then move on to consider the following: • Using known facts to find calculate possible answers to equations; • The main focus is on using known facts to create equations.	If a = 4 and b = 5 work out the following equations: 2a + 3b = ☐ 5b – 2a = ☐ 9a – b = ☐ 4a – 5b = ☐ 2a + ☐ = 23 ☐ + 5b = 41 If 15 + a + b = 32; Give at least two possible values for a and b If 39 + x + y = 45; Give at least two possible values for x and y; If 2x + 3y = 25; Give at least two possible values for x and y; If x^2 - 8 = b; Give at least two possible values for x and y Mousefield has 10 trees more than half the trees in Henfield. If Mousefield has 67 trees, how many trees has Henfield? If Henfield has 142 trees, how many trees has Mousefield? If 3x = 18, then what is the value of y in these equations: 2x + y = 20 3x + 17 + 2y = 55 y – 5x = -6 2y + 5x = 24 $x^2 + y^2 = 64$ $x^2 - y^2 = 20$

Summer 2: Week 1: Mastering this Objective – Deeper Understanding

Algebra: -Find pairs of numbers that satisfy number sentences with two unknowns.
-Enumerate all possibilities of combinations of two variables.

Teaching Sequence	If pupils have mastered this objective they will be able to complete these activities independently:	
➢ Use known facts to calculate, if 17 + x + y = 42, use known number facts to calculate possible values for x and y. ➢ Use known facts to complete a table, e.g. 'The brown string is 9cm less than 2 times as long as the yellow string'. So… if y=5, s =?	The first number in the sequence 2a + 3 is 5; What is the tenth number in the sequence? If the third number in the sequence 4x – 6 is 6; what is the eighth number in the sequence? If the fifth number in the sequence 5x – 2 is 23; what will be the twelfth number in the sequence?	The brown tape is 5cm shorter than half the blue tape. If the brown tape is 10cm, how long is the blue tape? What if the brown tape was 8cm.? What if the blue tape was 30cm. How long is the brown tape? Box A weighs 10Kg less than half the weight of Box B. If Box A weighs 55Kg, how much does Box B weigh?
	Water bottle A has 2 litres more than a quarter of the contents of Water Bottle B. If Water Bottle A holds 12 litres how much does Water Bottle B hold? What if Water Bottle B holds 28 litres, how much will Water Bottle A hold? Create another Water Bottle problem for your friend to solve.	If 18 + x + y = 32; and 10 + x + y = 24 Give two possible values for x and y If 2x + y + 17 = 31; and 3x – y = 11 Give possible values for x and y. Create your own for others to try.

Summer 2: Week 1: Working at greater depth

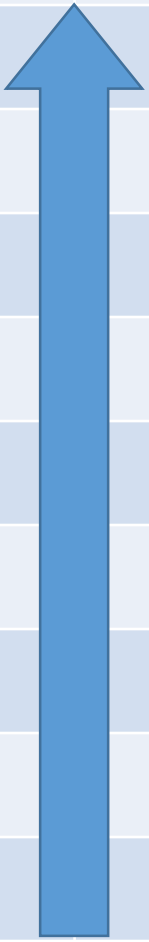
Algebra: -Find pairs of numbers that satisfy number sentences with two unknowns.
-Enumerate all possibilities of combinations of two variables.

Teaching Sequence	Activities for pupils working at greater depth:	
➢ Use known facts to calculate, if 17 + x + y = 42, use known number facts to calculate possible values for x and y. ➢ Use known facts to complete a table, e.g. 'The brown string is 9cm less than 2 times as long as the yellow string'. So… if y=5, s =?	Work out the values of x and y from these two equations: 3x + 2y = 13 and 4x – 2y = 9 Now do the same for a and b: 7a + 3b = 46 and 5a + b = 32 Finally do the same for c and d 3c – d = 9 and 5c + 2d = 26	Work out the value of c If 5c is a number in the 20s; and 3c + 3 is a number greater than 4^2 Work out the value of x If x^2 is a number in the 30s. Work out the value of y If 3y + 2 is an odd number in the 20s; and y^2 is a number less than 50 but greater than 40
	Dad is 25 years older than James and 2 years older than mum. At the moment their combined ages is 78. How old will James be in 10 years time? Aunty Vera is 42 years older than Nina. Aunty Vera is 3 years older than Uncle Tom. At the moment their combined ages is 96 years. How old will Nina be in 8 years time?	Consider the rule: start with 12 and then add 5, then another 5 , and another 5, etc. How could you set up a equation to find the 7^{th} number in this sequence? Now do the same if you start with 4 and add 7 each time. What would the equation look like for finding out the 10^{th} in the sequence?

Summer 2: Week 1: Assessment (as Summer 1 Week 5)

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Algebra: -Find pairs of numbers that satisfy number sentences with two unknowns. -Enumerate all possibilities of combinations of two variables.	Me	My Teacher
Can you use known facts to calculate two unknowns?		
Can you solve problems which require you to think algebraically?		
Can you use rules algebraically for known relationships, e.g. p=4s for finding the perimeter of a square?		
Can you work out calculations when given value of 2 letters, e.g. What is 2a+3b if a=2 and b=5?		
Can you work out equations involving missing amounts, e.g. If 2x-1=9, what is x?		
Do you know that the expression 2a means 2 times the value of a?		
Can you find a missing number in an equation involving subtraction?		
Can you find a missing number in an equation involving addition?		
Can you explain what an equation is?		



Year 6: Summer 2

Week 2: Addition & Subtraction

Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Summer 1: Week 2: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Summer 2: Week 2
Objective: Addition, Subtraction	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Country A has a population of 1,234, 897; and Country B a population of 2,786,123. How many more live in Country B than in country A?			At a factory 4,967,123 Smarties are produced each week. How many will be produced after 3 weeks?		
Voyager spacecraft made three journeys into space. The first journey was 1,567,987Km; the second 3,456, 094Km and the third 3,675,912. How much further did Voyager travel on the longest journey compared to the shortest journey?			If 1,768,235 books are produced over 5 days at a printers, how many books are produced each day?		
In Wales it is claimed that 667,894 speak Welsh as their first language. The population of Wales is 3,065,476. How many people who live in Wales do not have Welsh as their first language?			A new style vehicle can travel for 85,125Km but has to change its electrical system 5 times during the journey. How far does it travel with each electrical system?		
The total attendance at City's matches this season was 4,986,012; they played 24 matches in total. What was the average attendance at each match?			700,876 attended theatre productions in London last year. 223,457 were male. How many females attended? If each ticket cost an average of £5.50, how much money was taken altogether?		

Summer 2: Week 2: Practice and Consolidation

Addition & Subtraction: Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
Revise: ➢ Using all 4 operations ➢ Calculating a problem using at least 2 operations ➢ Calculating 2-step problems ➢ Explaining the order to solve calculations ➢ Solving calculations in correct order	• **As with Summer 1 Week 2** • The main focus in this unit is to ensure pupils are secure in their ability to tackle problems, looking for key words and also reading the problem carefully before attempting to solve it. • In addition it is an opportunity to see again how effectively pupils are applying their basic skills, in context. • Hopefully no one will be hampered in their problem solving through their lack of fluency in basic number. • Help pupils to work out reasonableness as a check to find out whether their answer is plausible.	Rosso's Pizza sells small, medium, and large pizzas. Last week, they sold 74 small pizzas. They sold 9 more medium pizzas than large pizzas. Altogether they sold 189 pizzas. How many large pizzas did they sell? Alfie bought 7 football and space heroes stickers with his pocket money. The football stickers cost 8p and the space heroes stickers cost 5p. If Alfie spent exactly 47p, how many of each type of sticker did he buy? A popular singer earns £45,000 for each appearance she makes on a tour. If she performs for 6 days, which of these totals is closest to the amount of money she is likely to make? £450,000 £4,500,000 £300,000 or £250,000 A cake shop mixes 6.4Kg of cake mixture for cup cakes every single minute. How much cake mixture will they have made in 30 minutes? If they make 10 cup cakes from 100grms of the mixture. How many cup cakes will they have produced in 10 minutes? Cup cakes cost £1 for 3; how much money will the cake shop make every 10 minutes?

Summer 2: Week 2: Mastering this Objective – Deeper Understanding

Addition & Subtraction: Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Teaching Sequence

Revise:

- Using all 4 operations
- Calculating a problem using at least 2 operations
- Calculating 2-step problems
- Explaining the order to solve calculations
- Solving calculations in correct order

If pupils have mastered this objective they will be able to complete these activities independently:

Jonathon has 15 friends arriving for a party, He has exactly 4 litres of cola to share amongst everyone. He pours exactly the same amount into all 16 glasses.
How much cola will each person receive?

He also bought 10 pizzas to share between the 16 of them. If each pizza has already been sliced into 6 pieces, how many pieces will everyone receive?
Will there be any left over?

Rosso's Pizza sells small, medium, and large pizzas.
Last month, they sold 174 small pizzas. They sold 90 more medium pizzas than large pizzas. Altogether they sold 704 pizzas.
A small pizza costs £3; a medium costs £4 and a large costs £5.
How much money did they collect through the month?

Rosso's Pizza sells small, medium, and large pizzas.
Last month, they sold 274 small pizzas.
They sold 90 more medium pizzas than large pizzas. Altogether they sold 904 pizzas.
A small pizza costs £3; a medium costs £4 and a large costs £5.
How much money did they collect through the month?
If they increased the cost by 10% how much money would they make then?
If costs £1.20 to produce the small pizzas; £1.40 to produce the medium one and £1.50 to produce the large one.
How much profit did they make?
How much profit would they make if they were able to cut the costs by 20%?

Summer 2: Week 2: Working at greater depth

Addition & Subtraction: Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Teaching Sequence

Revise:

- Using all 4 operations
- Calculating a problem using at least 2 operations
- Calculating 2-step problems
- Explaining the order to solve calculations
- Solving calculations in correct order

Activities for pupils working at greater depth:

Viking Problem

A Viking Lord needed to defend his settlement. He had an army of 305 Vikings at his disposal. He needed to get them to England, the cheapest possible way.
He could hire as many of the 5 different longboats that he needed.

Length of Longboat	Number of boats available	Number of Vikings that it could take	Cost of hiring 1 longboat (in Viking coins)
10m	3	25	250
8m	4	20	200
6m	6	15	180
4m	8	12	156
3m	15	10	150

This table shows the cost per Viking on each boat	
Type of Longboat	**Cost per Viking**
10m	10 Viking coins
8m	10 Viking Coins
6m	12 Viking coins
4m	13 Viking coins
3m	15 Viking coins

Work out how he could transport 305 men to England in the cheapest possible way. Start by creating a table showing:

- Type of longboat
- Number hired
- Total carried
- Cost

The population of the United Kingdom has increased to 65,100,000 in 2016.
The population increases by 10% each year.
How many people will be living in the United Kingdom in 2024? Show your answers on this table:

Year	Population
2016	65,100,000
2017	
2018	
2019	
2020	
2021	
2022	
2023	
2024	

Summer 2: Week 2: Assessment (As with Summer 1 Week 2)

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Addition & Subtraction: Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.	Me	My Teacher
Do you, as a matter of course, check the reasonableness of your answer?		
Can you solve word problems with mixed operations with numbers up to 10,000,000?		
Can you solve word problems involving division with numbers up to 10,000,000?		
Can you solve word problems involving multiplication with numbers up to 10,000,000?		
Can you solve word problems involving subtraction with numbers up to 10,000,000?		
Can you solve word problems involving addition with numbers up to 10,000,000?		
Do you work out an approximate answer before tackling a problem?		
Do you consistently read problems carefully and look for key words before attempting to solve it?		

Year 6: Summer 2

Week 3: Fractions

-Divide proper fractions by whole numbers.
-Use written division methods where the answer has up to two decimal places.
-Associate a fraction with division to calculate decimal fraction equivalents, for simple fractions

Summer 2: Week 3: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Summer 2: Week 3
Objective: Fractions	-Divide proper fractions by whole numbers. -Use written division methods where the answer has up to two decimal places. -Associate a fraction with division to calculate decimal fraction equivalents, for simple fractions

Complete these divisions			***Write these fractions as decimal fractions***		
3/5 ÷ 3			1/10th		
2/7 ÷ 4			3/10th		
8/9 ÷ 6			1/8th		
1/8 ÷ 4			3/4		

Summer 2: Week 3: Practice and Consolidation

Fractions: -Divide proper fractions by whole numbers.
-Use written division methods where the answer has up to two decimal places.
-Associate a fraction with division to calculate decimal fraction equivalents, for simple fractions

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Divide a proper fraction by a whole number. ➢ Divide a proper fraction by a whole number and give the answer in its simples form. ➢ Know that 1/10 can be represented as 0.1 ➢ Know that 1/5 can be represented at 0.2 ➢ Know that ¼ can be represented as 0.25 ➢ Know that ½ can be represented as 0.5 ➢ Know that ¾ can be represented as 0.75 ➢ Calculate decimal fraction equivalent for all fractional values where the denominator is 3, 4, 5, 6, 8 or 10	• This unit has a number of revision issues. • Firstly, writing fractions as decimal fractions. Ensure pupils are confident with this and that they can recall familiar fractions, such as, ¼; ¾; ⅛ and 1/10th • Then move on to equivalent fractions and get pupils to write equivalent fractions for familiar fractions such as: ¼; ¾; ⅛ and 1/10th • Then move on to dividing fractions by whole numbers.	Reduce the following fractions to their simplest form: $\frac{15}{12}$ $\frac{15}{9}$ $\frac{12}{20}$ $\frac{20}{36}$ $\frac{14}{28}$ $\frac{30}{50}$ $\frac{10}{15}$ $\frac{6}{24}$ Write these fractions as decimal fractions: $\frac{1}{4}$ $\frac{2}{5}$ $\frac{1}{6}$ $\frac{1}{2}$ $\frac{3}{5}$ $\frac{3}{4}$ $\frac{2}{3}$ $\frac{1}{8}$ $\frac{1}{10}$ Divide each of these fractions by 5; then by 6 and then by 8 $\frac{2}{3}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{3}{10}$ $\frac{1}{7}$ $\frac{3}{8}$ $1\frac{1}{2}$ $2\frac{2}{3}$ Complete the following: $\frac{2}{3} \div 8$ $\frac{5}{6} \div 10$ $\frac{6}{7} \div 3$ $\frac{11}{12} \div 11$ $\frac{9}{10} \div 3$

Summer 2: Week 3: Mastering this Objective – Deeper Understanding

Fractions: -Divide proper fractions by whole numbers.
-Use written division methods where the answer has up to two decimal places.
-Associate a fraction with division to calculate decimal fraction equivalents, for simple fractions

Teaching Sequence

- Divide a proper fraction by a whole number.
- Divide a proper fraction by a whole number and give the answer in its simples form.
- Know that 1/10 can be represented as 0.1
- Know that 1/5 can be represented at 0.2
- Know that ¼ can be represented as 0.25
- Know that ½ can be represented as 0.5
- Know that ¾ can be represented as 0.75
- Calculate decimal fraction equivalent for all fractional values where the denominator is 3, 4, 5, 6, 8 or 10

If pupils have mastered this objective they will be able to complete these activities independently:

Replace each of the boxes with a whole number less than 20, so that the number sentence makes sense.

$\frac{2}{7} \div \square = \frac{1}{12}$ $\frac{3}{4} \div \square = \frac{1}{12}$

$\frac{3}{8} \div \square = \frac{1}{16}$ $\frac{4}{5} \div \square = \frac{1}{10}$

Hamid shares 4 pineapples equally amongst his friends. Each one gets ⅛ of a pineapple. How many people had a share?

Frank shares 8 cakes equally amongst his friends. Each one gets 1/3rd of a cake. How many people had a share?

Miriam shares 15 pizzas equally amongst her friends. Each one gets ¾. How many people had a share?

What is 10½Km ÷ 2?

What is 4 litres ÷ 3?

What is £35.20 ÷ 4?

What is £56.80 ÷ 8?

What is 4¼ litres ÷ 6?

What is 8¾Km ÷ 10?

Divide each of the fractions numbers on the left with each of the whole numbers on the right:

⅞	7
¾	8
⅝	6
½	9

Summer 2: Week 3: Working at greater depth

Fractions: -Divide proper fractions by whole numbers.
-Use written division methods where the answer has up to two decimal places.
-Associate a fraction with division to calculate decimal fraction equivalents, for simple fractions

Teaching Sequence

- Divide a proper fraction by a whole number.
- Divide a proper fraction by a whole number and give the answer in its simples form.
- Know that 1/10 can be represented as 0.1
- Know that 1/5 can be represented at 0.2
- Know that ¼ can be represented as 0.25
- Know that ½ can be represented as 0.5
- Know that ¾ can be represented as 0.75
- Calculate decimal fraction equivalent for all fractional values where the denominator is 3, 4, 5, 6, 8 or 10

Activities for pupils working at greater depth:

$\frac{2}{3}$ $\frac{5}{6}$ $\frac{3}{10}$ $\frac{7}{8}$

Divide each of these fractions by 5; then 6; then 8 and finally by 10.
Order your 16 answers by value: highest first.

Which of the following fractions can be divided by 5; 8 or 10 and leave an answer of greater than 5 and less than 5?

$4\frac{5}{7}$ $6\frac{4}{5}$ $8\frac{3}{4}$ $7\frac{2}{3}$ $9\frac{3}{5}$ $11\frac{7}{9}$

	< 5	> 5
÷5		
÷8		
÷10		

÷	1/8	3/8	5/8	7/8
4				
6				
8				
10				

What do you notice when you complete the table to the left?

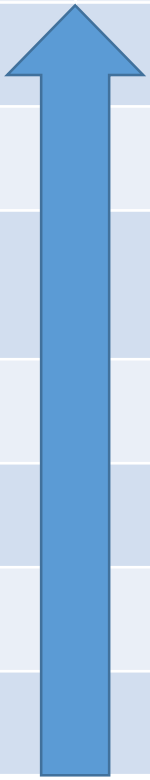
Find a whole number less than 10 that when divided by a fraction gives an answer of between 5 and 5½.

Find a whole number less than 20 that when divided by a fraction gives an answer of between 10 and 15.

Summer 2: Week 3: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Fractions: -Divide proper fractions by whole numbers. -Use written division methods where the answer has up to two decimal places. -Associate a fraction with division to calculate decimal fraction equivalents, for simple fractions	Me	My Teacher
Can you calculate the decimal fraction equivalent for all fractional values where the denominator is 3, 4, 5, 6, 8 or 10?		
Do you know that 0.1 is the same as 1/10th etc?		
Can you divide a proper fraction by a whole number and give the answer in its simplest form?		
Can you divide a proper fraction by a whole number?		
Can you divide a whole number by a fraction?		
Can you write an improper fraction as a mixed number?		
Can you reduce any fraction to its simplest form?		



Year 6: Summer 2

Week 4: Statistics

Calculate and interpret the mean as an average

Summer 2: Week 4: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Summer 2: Week 4
Objective: Statistics	Calculate and interpret the mean as an average

What is the mean of the following sets of numbers?			***Make up numbers***		
23, 87, 24, 16 and 55			Show five different numbers with a mean of 25.		
74, 89, 91 and 62			Show six different numbers with a mean of 35.		
12.5, 31.8 and 15.7			Show ten different numbers with a mean of 15.		
4¾; 5; 8¾ and 9½			Show eight different numbers with a mean of 9.		

Summer 2: Week 4: Practice and Consolidation

Statistics: Calculate and interpret the mean as an average

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Know the term mean is the average ➢ Find the mean of a given set of numbers	• Let pupils become familiar with the term mean, as in average. • Explain briefly about other terms such as mode and median. • Use pupil heights to demonstrate the difference between the mean and mode and median. • Let groups of pupils provide you with information about various things, such as number pages they have read in their present book, and then work out the mean together.	What is the mean of the following sets of numbers?: 24, 98, 67, 91 and 105 — 44, 78, 97, 121 and 125 56, 45, 23, 46, 98 and 61 — 66, 54, 17, 99, 101 and 59 24, 98, 77, 36, 89, 23, 90 and 43 — 14, 88, 37, 34, 77, 21, 80 and 46 Show 4 different numbers whose mean is 25. Show 6 different numbers whose mean is 25. Show 10 different numbers whose mean is 35. Show 8 different numbers whose mean is 23. Show 5 different numbers whose mean is 250. Bob plays cricket and he is very keen to find out how he is doing. In his first 5 innings he scores: 26; 72; 66; 90 and 31. In his sixth innings he scores 89. How much was this above the mean score (over the first five innings)? What is the mean of the following sets of numbers: 12.5; 31.8; 8.7; 11. 8 — 9.8; 7.6; 5.4; 11.2 23.7; 34.7; 9.9; 12.5 — 11.8; 12.7; 12.9; 23.1; 16.7

Summer 2: Week 4: Mastering this Objective – Deeper Understanding

Statistics: Calculate and interpret the mean as an average

Teaching Sequence

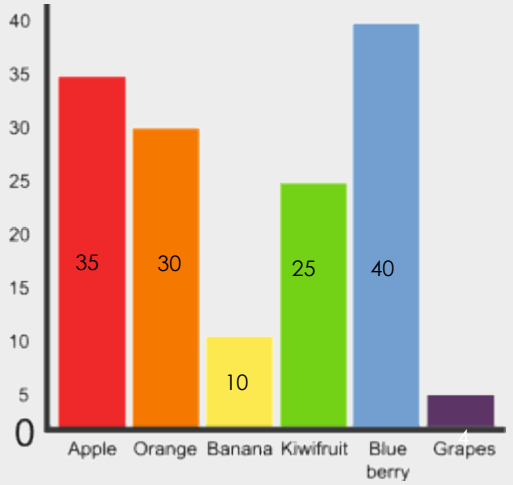
- Know the term mean is the average
- Find the mean of a given set of numbers

If pupils have mastered this objective they will be able to complete these activities independently:

If the mean of the following set is 12; what is the missing number?
10; 13; 17; x ; 12

If the mean of the following set is 30; what is the missing number?
25; x; 26; 31; 32

If the mean of the following set is 140; what is the missing number?
112; 148; 155; x ; 168



The bar chart shows the number of boxes of fruit sold in one hour in a busy supermarket.
What is the mean?
If the mean was 30 boxes, show one possible bar chart of the sales.

Time (Minutes)	Temp (°C)
0	16
1	23
2	32
3	43
4	54
5	60
6	68
7	75
8	80
9	86
10	90

The table shows the temperature within a boiler over a 10 minute period.
What is the mean temperature of the water over this 10 minutes?
If you look at the mid point between the highest and lowest temperature, how does that differ from the mean?

The mean score in six spelling tests, with 20 questions, is 15.
Five of the scores were: 13, 12, 17, 18, 16
What was the missing score?
The mean score in six spelling tests, with 25 questions is 17.
Nine of the scores were: 12; 24; 17; 22; 16;
What is the missing score?

Summer 2: Week 4: Working at greater depth

Statistics: Calculate and interpret the mean as an average

Teaching Sequence

- Know the term mean is the average
- Find the mean of a given set of numbers

Activities for pupils working at greater depth:

A class records the temperature during a day in January. The results are set out below

8	9	10	11	12	1	2	3	4	5
-7	-2	-1	+2	+4	+8	+5	+5	+2	0

What is the mean temperature between 8am and 5pm?
Give the answer in a decimal fraction form.
Now give the answer to the nearest whole degree.

A class measure the shadow of one of their classmates through the day: the results are shown below:

time	9	10	11	12	1	2	3
Shadow In metres	1.07	0.98	0.68	0.15	0.35	0.55	0.93

Give the answer to the nearest cm.

Now take a group of 5 friends and measure their height. If the mean height of 6 friends is 1m 54cm, how tall would the sixth person have to be to achieve this?

At a sports event, groups of four runners are trying to get into the county team. They have been told that they have to run the 4 x400 metre relay in 4 minutes or less to qualify. The times of the first three runners are shown below:

	Runner 1	Runner 2	Runner 3
Team A	62 secs	59 secs	61 secs
Team B	66 secs	60 secs	62 secs
Team C	58 secs	56 secs	59 secs
Team D	67 secs	62 secs	58 secs

What time has each team's fourth runner to achieve for the team to qualify?
Which team is most likely to do this?
If the Under 12 World Record for running 400 metres is 55 seconds, what does this tell you about Team D?

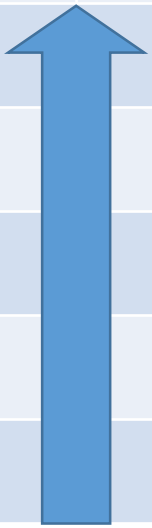
Make up a set of five numbers with a mean of 2.7

Make up a set of eight numbers with a mean of 5.75.

Summer 2: Week 4: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Statistics: Calculate and interpret the mean as an average	Me	My Teacher
Can you deduce information from sets of figures given when checking the mean?		
Can you find the average of a given set of numbers when presented in a problem solving format?		
When given the mean, can you find a missing number from a given set of numbers?		
Can you find the average of a given set of numbers?		
Do you know the term mean is the average?		



Year 6: Summer 2

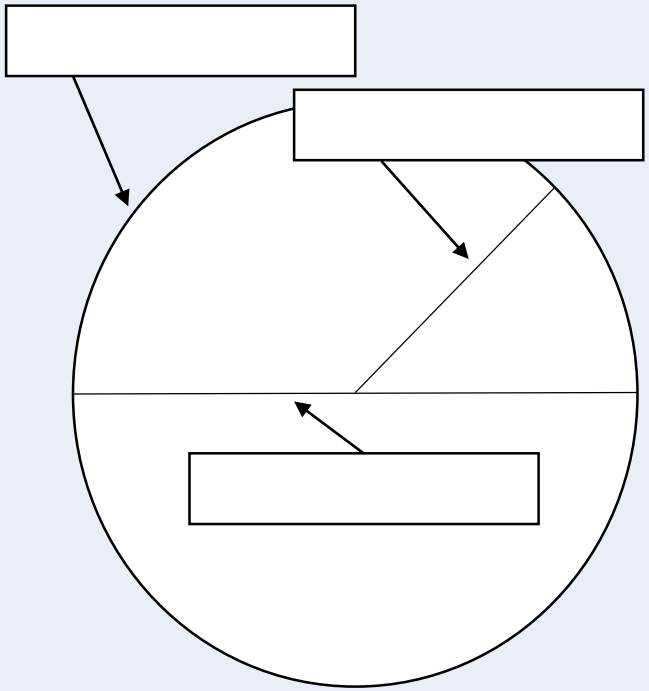
Week 5: Geometry

Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.

Summer 2: Week 5: Pre-Learning Task

The pre-learning task below could be used to assess pupils' starting points within this objective. It needs to be completed by all/ or some of the pupils in advance of the main teaching.

Name	Summer 2: Week 5
Objective: Geometry	Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.



Label this circle with the words diameter; circumference and radius.

If the diameter is 15.8cm, what is the radius?

If the diameter is 19.8cm, what is the radius?

If the radius is 19.5cm, what is the diameter?

If the radius is 7.3cm, what is the diameter?

Summer 2: Week 5: Practice and Consolidation

Geometry: Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:
➢ Know that the line across the centre of a circle is known as the diameter ➢ Know that the distance from the centre of a circle to the arc of the circle is the radius ➢ Know the distance around the outside of the circle is called the circumference ➢ Know the diameter of the circle is twice the radius	• There needs to be time spent on ensuring that pupils know the appropriate vocabulary associated with circles. • The terms radius; diameter and circumference needs to known by all pupils. • Use a large string to show what is meant by radius; diameter and circumference.	Write an accurate description of the following: • Circumference • Radius • Diameter • Semi-circle Think of a circle. Put the following in order with the longest first: Radius; Circumference and Diameter. Here are three measures of a circle: 5cm 10cm 31.4cm Which is the radius? Which is the diameter? Which is the circumference? Draw a circle with a radius of 8cm. Label the radius; diameter and circumference. Use a string to work out the approximate measure of the circumference. How long is the diameter? Is the circumference more likely to be: 30cm; 40cm; or 50cm? Now do the same with circle whose radius is 10cm; 15cm;

Summer 2: Week 5: Mastering this Objective – Deeper Understanding

Geometry: Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.

Teaching Sequence

- Know that the line across the centre of a circle is known as the diameter
- Know that the distance from the centre of a circle to the arc of the circle is the radius
- Know the distance around the outside of the circle is called the circumference
- Know the diameter of the circle is twice the radius

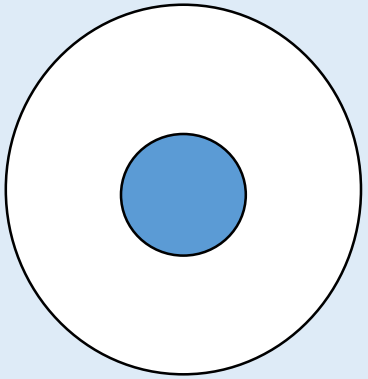
If pupils have mastered this objective they will be able to complete these activities independently:

Draw a circle with the radius shown on the chart and then use a string to measure the circumference of each.

Radius	Diameter	Circumference
5cm		
7cm		
8cm		
10cm		
12cm		
15cm		
20cm		

What do you notice about the pattern? What can you say about the relationship between the radius and the circumference?

At a special circular theatre, there is a central circular stage, as shown.



The seats are organised in circles around the centre stage.
There are 15 circles of seats from the stage to outside wall.
If the circle of seats nearest to the stage is made up of 70 seats and each circle outside the first has 10 more seats, each time, that is, the second circle has 80 seats and the third circle has 90 seats, etc.
How many seats are there altogether?
If the stage is 10 metres in diameter and the first circle of seats is 1 metre away from the stage and the next circle a metre from the one in front and this continues to the outer wall; what is the diameter of the building?

Summer 2: Week 5: Working at greater depth

Geometry: Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.

Teaching Sequence

- Know that the line across the centre of a circle is known as the diameter
- Know that the distance from the centre of a circle to the arc of the circle is the radius
- Know the distance around the outside of the circle is called the circumference
- Know the diameter of the circle is twice the radius

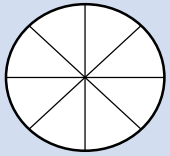
Activities for pupils working at greater depth:

Knowing the approximate relationship between the radius; diameter and circumference, complete the following chart:

Radius	Diameter	Circumference
5cm		
	15cm	
		50cm
		90cm

A pie is 30cm in diameter.
It is cut up into 8 pieces.
Each piece weighs 500gms.
Work out the approximate perimeter of each piece.
If each piece of pie is made up of 8 parts of apple to 1 part of pastry and 1 part of sugar, how much apple is in the full pie?

A farmer has a circular field which has a diameter of 30 metres.
He creates 6 equal segments as shown:



He fences in each of the segments.
How much fencing does he need for:

- The segments
- The circumference of the field (approximate)

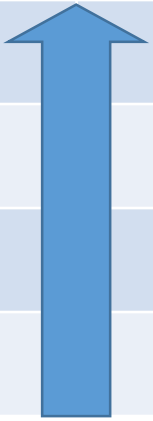
- Using your knowledge of the area of a triangle, work out what the approximate area of each segment.
- What is the approximate perimeter of each of the segments?

Create a piece of art work using intersecting circles of different sizes.
Try to think of a theme and stick to it.

Summer 2: Week 5: Assessment

The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Geometry: Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.	Me	My Teacher
Do you know that the diameter of a circle is twice its radius?		
Do you know that distance around the outside of a circle is the circumference?		
Do you know that the distance from the centre to the arc of a circle is the radius?		
Do you know that the line across the centre of a circle is known as the diameter?		



Year 6: Summer 2

Week 6: Consolidate and Assess

- Start this week by revising the learning covered in Year 6 so as to ensure pupils are fluent and secure with their basic skills.
- Use a simple assessment process to check on pupils' confidence and consistency in using the learning outlined in Year 6.
- Analyse the results and use information to help focus the intervention sessions, as needed, for the following term.

Year 6: Spring 2: Week 6

The focus of the consolidation should be the following aspects:

- Count on/back from a given number in steps of 10/100/1000/10000 to 1,000,000 and beyond
- Count on/back in whole numbers, fraction and decimal sequences through zero to include negative numbers (e.g. 2.5 or 1 ¼)
- Find 0.001, 0.01, 0.1, 1, 10 and powers of 10 more or less than a given number
- Read, write, partition, order and compare numbers to 10,000,000
- Round any number to 10,000,000 to the nearest 10, 100, 1000, 10,000 and 100,000 (e.g. round any 6 digit number to the nearest hundred thousand and 7-digit number to the nearest million)
- Order and compare numbers including integers, decimals and negative numbers
- Read, write, order, partition and compare decimal numbers up to 3dp
- Round decimals with 3dp to the nearest whole number or to one or two decimal places
- Multiply and divide any whole and decimal number by 10, 100 and 1000 giving answers up to 3dp
- Perform mental calculations with larger numbers and mental calculations which include at least 2 different operations (e.g. addition and multiplication)
- Continue a linear number sequence with positive and negative numbers, decimal and proper fractions including through zero
- Find factors and factor pairs of numbers to 100
- Convert units of measurement using decimal notation up to 3dp (km and m; cm and m; cm and mm; gram and km, ml and L and time)
- Find complements to 1000, 10,000 and to £10.00, £20.00 £50 and £100

- Although practise and consolidation should be on-going through each half term, during Week 6 there should be greater opportunity taken to check pupils' learning and understanding.
- Summative and Formative assessment procedures should help teachers gain a clear picture as to which pupils are at different stages, including mastery and greater depth.