

Year 5

Mathematics

Non-Negotiables

- Count forwards and backward with positive and negative numbers through zero.
- Count forwards and backwards in steps of powers of 10 for any given number up to 1000000.
- Compare and order numbers with 3 decimal places.
- Read Roman numerals to 1000.
- Identify all multiples and factors, including finding all factor pairs.
- Use known tables to derive other number facts.
- Recall prime numbers up to 19.
- Recognise place value of any number up to 1,000,000.
- Round any number to 1,000,000 to the nearest 10, 100, 1000, 10,000 or 100,000.
- Round decimals with 2 decimal places to nearest whole number and 1 decimal place.

Add and subtract:

- Numbers with more than 4-digits using efficient written method (column).
- Numbers with up to 2 decimal places.

Multiply:

- 4-digits by 1-digit/ 2-digit

Divide:

- 4-digits by 1-digit

Multiply and divide:

- Whole numbers and decimals by 10, 100 & 1000

- Count up/down in thousandths.
- Recognise mixed numbers and fractions and convert from one to another.
- Multiply proper fractions by whole numbers.
- Solve time problems using timetables and converting between different units of time.

The following 3 pages suggest a planning outline for delivering the non-negotiables in classrooms..
There should be some element of teaching of these each day.

Year 5 Arithmetic Non-Negotiables	
Autumn Term	
1st Half Term	2nd Half Term
<ul style="list-style-type: none"> • Count on/back from a given number in steps of 100/1000/10,000 up to a 100,000 • Read, write and order numbers to 100,000 • Compare numbers to at least 100,000 • Partition numbers to at least 100,000 • Find powers of 10 more than a given number • Multiply and divide numbers mentally drawing upon known facts • Multiply and divide any whole number by 10 and 100 and multiply and divide any decimal number by 10 • Count on/back with positive and negative numbers, including through zero • Round any number up to 50,000 to the nearest 10, 100 and 1000 • Add/subtract: 3-digit and 1-digit numbers, a 3-digit number and tens and a 3-digit number and hundreds, combinations of 2 and 3 digit numbers • Find complements to 100 and 1000 and 10, 000 • Find factors and factor pairs of each number up to 20 	<ul style="list-style-type: none"> • Count on/back from a given number in steps of 100/1000/10,000 up to and beyond a 100,000 • Read, write and order numbers to 100,000 and beyond • Compare numbers to 100,000 and beyond • Partition numbers to 100,000 and beyond • Find powers of 10 more than a given number • Read, write, order and compare decimal numbers up to 2dp • Partition decimal numbers to 2dp • Round decimals with 1dp to the nearest whole number • Multiply and divide numbers mentally drawing upon known facts • Multiply and divide any whole number by 10 and 100 and multiply and divide any decimal number by 10 and 100 • Count on/back with positive and negative numbers, including through zero) • Count on/back in fraction and decimal sequences (e.g. 2.5 or $1\frac{1}{2}$) • Round any number up to 100,000 to the nearest 10, 100 and 1000 • Add/subtract: 4-digit and 1-digit numbers, a 4 digit and tens, a 4-digit number and hundreds and a 4-digit number and thousands and combinations of pairs of 2,3 or 4 digit numbers • Find factors and factor pairs of each number up to and beyond 20 • Find complements to 1000 • Convert units of measurement (km and m; cm and m; cm and mm; gram and km, ml and L)

Year 5
Arithmetic
Non-Negotiables

Spring Term

1st Half Term

- Count on/back from a given number in steps of 100/1000/10,000/100,000 up to 500,000
- Read, write and order numbers to 500,000
- Compare numbers to at least 500,000
- Partition numbers to at least 500,000
- Find powers of 10 more than a given number
- Read, write, order and compare decimal numbers up to 3dp
- Partition decimal numbers to 3dp
- Round decimals with 1 and 2dp to the nearest whole number
- Multiply and divide numbers mentally drawing upon known facts
- Multiply and divide any whole number by 10, 100, 1000 and multiply and divide any decimal number by 10 and 100
- Count on/back with positive and negative numbers, including through zero
- Count on/back in fraction and decimal sequences? (e.g. 2.5 or $1\frac{1}{2}$)
- Round any number up to 500,000 to the nearest 10, 100, 1000, 10,000 and 100,000
- Add/subtract: 4-digit and 1-digit numbers, a 4 digit and tens, a 4-digit number and hundreds and a 4-digit number and thousands and combinations of pairs of 2,3 or 4 digit numbers
- Mentally add and subtract tenths
- Find factors and factor pairs of each number up to 50
- Find complements to 100 and 1000 and to £1.00
- Convert units of measurement (km and m; cm and m; cm and mm; gram and km, ml and L)

2nd Half Term

- Count on/back from a given number in steps of 100/1000/10,000/100,000 up to and beyond 500,000
- Read, write and order numbers to 500,000 and beyond
- Compare numbers to 500,000 and beyond
- Partition numbers to 500,000 and beyond
- Find powers of 10 more than a given number
- Read, write, order and compare decimal numbers up to 3dp
- Partition decimal numbers to 3dp
- Round decimals with 1 and 2dp to the nearest whole number
- Multiply and divide numbers mentally drawing upon known facts
- Multiply and divide any whole number by 10, 100, 1000 and multiply and divide any decimal number by 10 and 100
- Count on/back with positive and negative numbers, including through zero)
- Count on/back in fraction and decimal sequences (e.g. 2.5 or $1\frac{1}{2}$)
- Round any number up to 500,000 and beyond to the nearest 10, 100, 1000, 10,000 and 100,000
- Add mentally a 4 digit number and a 3 digit number (for example $8,345 + 230$)
- Subtract mentally any 4-digit number from a 3-digit number (for example $8,345 - 230$)
- Find factors and factor pairs of each number up to 50 and beyond
- Find complements to 100 and 1000; £1.00 and £5.00 and to 1 using 2dp
- Convert units of measurement (km and m; cm and m; cm and mm; gram and km, ml and L)
- Mentally add and subtract tenths

Year 5
Arithmetic
Non-Negotiables

Summer Term

1st Half Term

- Count on/back from a given number in steps of 100/1000/10,000/100,000 up to a 1,000,000
- Read, write and order numbers to 1,000,000
- Compare numbers to at least 1,000,000
- Partition numbers to at least 1,000,000
- Find powers of 10 more than a given number
- Read, write, partition, order and compare decimal numbers up to 3dp
- Round decimals with 1 and 2dp to the nearest whole number and to 1dp
- Multiply and divide numbers mentally drawing upon known facts
- Multiply and divide any whole and decimal number by 10, 100, 1000
- Count on/back with positive and negative numbers, including through zero
- Count on/back in fraction and decimal sequences (e.g. 2.5 or $1\frac{1}{2}$)
- Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 and 100,000
- Add mentally a 4 digit number and 3 digit numbers (for example $8,345 + 230$)
- Subtract mentally any 4-digit number from a 3-digit number (e.g. $8,345 - 230$)
- Mentally add and subtract tenths and one-digit whole numbers and tenths
- Find factors and factor pairs of each number up to 100
- Find complements to 100 and 1000; £1.00 and £5.00 and to 1 using 2dp
- Convert units of measurement
(km and m; cm and m; cm and mm; gram and km, ml and L)

2nd Half Term

- Count on/back from a given number in steps of 100/1000/10,000/100,000 to a 1,000,000 and beyond
- Read, write, and order numbers to 1,000,000 and beyond
- Compare numbers to 100,000 and beyond
- Partition numbers to 1,000,000 and beyond
- Find powers of 10 more than a given number
- Read, write, partition, order and compare decimal numbers up to 3dp
- Round decimals with 1 and 2dp to the nearest whole number and to 1dp
- Multiply and divide numbers mentally drawing upon known facts
- Multiply and divide any whole and decimal number by 10, 100, 1000
- Count on/back with positive and negative numbers, including through zero
- Count on/back in fraction and decimal sequences (e.g. 2.5 or $1\frac{1}{2}$)
- Round any number to 1,000,000 and beyond to the nearest 10, 100, 1000, 10,000 and 100,000
- Add mentally a 5-digit number and 4- digit numbers (e.g. $15,345 + 2300$)
- Mentally add and subtract tenths and one-digit whole numbers and tenths
- Find complements to 100, 1000, 10,000; £1.00, £5.00 and £10.00; and to 1 using 3dp
- 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)

YEAR 5 : AUTUMN 1: Overview and Teaching Steps

WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
1 Place Value	2 Place Value Decimals	1 Addition & Subtraction	1 Geometry Angles	1 Measures Perimeter and Area	2 Addition & Subtraction
Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000.	Count up and down in thousandths; recognise that thousandths arise from dividing an object into 1000 equal parts and in dividing numbers or quantities by 1000.	Add and subtract numbers mentally with increasingly large numbers.	Know angles are measured in degrees; estimate & compare acute, obtuse & reflex angles. Identify: - Angles at a point on a straight line & $\frac{1}{2}$ a turn (total 180°) - Angles at a point & one whole turn (total 360°) - Other multiples of 90° Draw given angles & measure them in degrees	- Measure and calculate the perimeter of composite rectilinear shapes in cm and m. - Calculate & compare the area of rectangles (including squares, & including using standard units, square centimetres (cm^2) and square metres (m^2) & estimate the area of irregular shapes.	Add and subtract whole numbers with more than 4 digits including using formal written methods (columnar addition and subtraction).
<ul style="list-style-type: none"> ➤ Count forwards and backwards from any given number in steps of 100 ➤ Count forwards and backwards from a given number in steps of 1,000 ➤ Count forwards and backwards from a given number in steps of 10,000 ➤ Count forwards or backwards from a given number in steps of 100,000 ➤ Count forwards and backwards from a given number in steps of 1,000,000 	<ul style="list-style-type: none"> ➤ Count up in thousandths starting at zero ➤ Count back in thousandths to zero ➤ Count up in thousandths starting at any 'thousandths number' ➤ Count back in thousandths starting at any 'thousandths number' ➤ Know that thousandths arise from dividing an object, quantity or number into 1000 equal parts ➤ Place fractions (thousandths) in order – ascending and descending. 	<p>Mentally:</p> <ul style="list-style-type: none"> ➤ Add any two 2-digit numbers ➤ Subtract any 2-digit number from any other greater 2-digit number ➤ Subtract any 2-digit number from any 3-digit number ➤ Add any 2-digit and any 3-digit number ➤ Subtract any 2-digit number from any 4-digit number ➤ Add together two 3-digit numbers ➤ Subtract a 3-digit number from a greater 3-digit number ➤ Add any 1000s number to any 4 or 5-digit number ➤ Subtract any 1000s number from a greater 5-digit number 	<ul style="list-style-type: none"> ➤ Know that 90° is equivalent to a quarter turn ➤ Know that 180° is equivalent to a half turn ➤ Know that 270° is equivalent to a three-quarter turn ➤ Know that 360° is equivalent to a full turn ➤ Estimate, compare and measure angles in drawings identifying acute, obtuse and reflex angles ➤ Able to use a protractor to measure angles ➤ Able to use a protractor to draw angles 	<ul style="list-style-type: none"> ➤ Calculate perimeter of range of shapes, including composite shapes by dividing into smaller shapes ➤ Know the units of measure for calculating area and how to represent (cm^2/m^2) ➤ Explain how to calculate the area of a shape using a formula ➤ Calculate area using formula ➤ Calculate the area of composite shapes by dividing into smaller shapes ➤ Calculate the area of larger spaces using m^2 	<ul style="list-style-type: none"> ➤ Add numbers with up to 5-digits with no exchanging ➤ Add numbers with up to 5-digits with exchanging ➤ Subtract numbers with up to 5-digits with no exchanging ➤ Subtract numbers with up to 5-digits with exchanging

YEAR 5 : AUTUMN 2: Overview and Teaching Steps

WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
1 Multiplication & Division - Factors Identify multiples and factors including finding all factor pairs of a number and common factors of two numbers.	2 Multiplication & Division -Multiply and divide numbers mentally drawing upon known facts. -Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers -Establish whether a number up to 100 is prime and recall prime numbers up to 19.	1 Fractions Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths. Read and write decimal numbers as fractions, e.g. $0.71 = 71/100$.	3 Multiplication & Division Multiply numbers up to 4-digits by a 1-digit or 2-digit number using a formal written method, including long multiplication for 2-digit numbers.	1 Statistics Complete, read and interpret information in: - tables, including timetables	Consolidate and Assess Start this week by revising the learning covered in the first half of 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 first half of the Autumn term. Analyse the results and use information to help focus the intervention and pre-teaching sessions, as needed, for the following half term.
<ul style="list-style-type: none"> ➤ Identify multiples of all numbers up to 100. ➤ Know all factors that make up all numbers to 100. 	<ul style="list-style-type: none"> ➤ Use mental applications to multiply numbers making use of multiplication tables up to 12×12. ➤ Use mental applications to divide numbers making use of multiplication tables up to 12×12. ➤ Describe what a prime number is ➤ Describe what a prime factor is ➤ Describe what a composite number is ➤ Explain how to work out whether a number is a prime number. ➤ Recall all prime numbers to 19. 	<ul style="list-style-type: none"> ➤ Identify equivalent fractions for $\frac{2}{3}$ ➤ Identify equivalent fractions for $\frac{2}{4}$ ➤ Identify equivalent fractions for $\frac{2}{10}$ ➤ Identify equivalent fractions for $\frac{2}{100}$ ➤ Write 0.5; 0.25; 0.1 as fractions ➤ Write any decimal with 1 decimal place as a fraction ➤ Write any decimal with 2 decimal places as a fraction 	<ul style="list-style-type: none"> ➤ Multiply any number with up to 3-digits by a single digit number. ➤ Multiply any number with up to 4-digits by any single number. ➤ Multiply any number with up to 3-digits by a 2-digit number. ➤ Multiply any number with up to 4-digits by a 2-digit number. 	<ul style="list-style-type: none"> ➤ Know how to construct a table from a set of given information ➤ Know how to construct a table using only the relevant information ➤ Read a table to answer questions ➤ Read a timetable to answer questions ➤ Construct own table and timetable making decision about labelling 	

YEAR 5 : SPRING 1: Overview and Teaching Steps

WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
3 Place Value Roman Numerals	3 Addition & Subtraction	4 Multiplication & Division	2 Measures Area	2 Geometry Reflection/ Translations	3 Geometry
<p>- Interpret negative numbers in context, count forwards and backwards with positive and negative numbers including through zero.</p> <p>- Read Roman numerals to 1000 and recognise years written in Roman numerals</p>	<p>Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.</p>	<p>Divide numbers up to 4-digits by a 1-digit number using the formal written method of short division and interpret remainders appropriately for the context.</p>	<p>Calculate & compare the area of rectangles (including squares) including using standard units, square centimetres (cm²) and square metres (m²) & estimate the area of irregular shapes.</p>	<p>Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language and know that the shape has not changed</p>	<p>Distinguish between regular and irregular polygons based on reasoning about equal sides and angles</p>
<ul style="list-style-type: none"> ➤ Interpret temperatures at - °C on a thermometer. ➤ Count forward from -20 to 20 ➤ Count backwards from 20 to -20 ➤ Revisit Roman numerals to 100 ➤ Read Roman numerals to 1000 ➤ Write Roman numerals to 1000 ➤ Read dates in context represented in Roman numerals 	<ul style="list-style-type: none"> ➤ Use rounding to add and subtract any 2-digit numbers to check reasonableness of answer. ➤ Use rounding to add and subtract any 3-digit numbers to check reasonableness of answer. ➤ Use rounding to add and subtract any 4-digit numbers to check reasonableness of answer. 	<ul style="list-style-type: none"> ➤ Divide any number with 3-digits by a single digit number with no remainder. ➤ Divide any number with 4-digits by a single digit number with no remainder. ➤ Divide any number with 3-digits by a single digit number with a remainder. ➤ Divide any number with 4-digits by a single digit number with a remainder. ➤ Divide any number with 3-digits by 10, showing remainder where appropriate. ➤ Divide any number with 4-digits by 10, showing remainder where appropriate. 	<ul style="list-style-type: none"> ➤ Know the units of measure for calculating area and how to represent (cm²/m²) ➤ Explain how to calculate the area of a shape using a formula ➤ Calculate area using formula ➤ Calculate the area of composite shapes by dividing into smaller shapes ➤ Calculate the area of larger spaces using m² 	<ul style="list-style-type: none"> ➤ Reflect a shape and re-plot ➤ Translate a shape and re-plot ➤ Describe the properties of the reflected and/or translated shape – evidencing that the shape and size has not changed 	<ul style="list-style-type: none"> ➤ Use known facts to explain differences between shapes

YEAR 5 : SPRING 2: Overview and Teaching Steps

WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
5 Multiplication & Division	4 Geometry	2 Fractions	3 Measures	2 Statistics	Consolidate and Assess
Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.	-Identify 3D shapes, including cubes and other cuboids, from 2D representations - Use the properties of rectangles to deduce related facts & find missing lengths & angles.	Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements.	- Estimate volume (e.g. using 1 cm ³ blocks to build cubes, including cuboids) & capacity (e.g. using water). - Convert between different units of metric measure (e.g. km/m; cm/m; cm/mm; g/kg; l/ml).	Solve comparison, addition and difference problems using information presented in a line graph	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 and pre-teaching sessions, as needed, for the following term.
<ul style="list-style-type: none"> ➤ Multiply any number by 10. ➤ Multiply any number by 100. ➤ Multiply any number by 1000. ➤ Divide any number by 10. ➤ Divide any number by 100. ➤ Divide any number by 1000. 	<ul style="list-style-type: none"> ➤ Identify 3D shapes from 2D images ➤ Calculate missing lengths and angles using known facts 	<ul style="list-style-type: none"> ➤ Know that a whole number can be written as a fraction, e.g. 2/2 etc. ➤ Know that 1½ can be written as 3/2 etc. ➤ Convert any improper fraction to a mixed fraction and vice versa 	<ul style="list-style-type: none"> ➤ Know that volume is measured in cm³ and m³ ➤ Use cubes to calculate the volume of a given shape ➤ Use water and measuring equipment to calculate the capacity of a range of containers ➤ Express a distance of more than 1km in m ➤ Express a distance of more than 1cm in mm ➤ Express a mass of more than 1kg in g ➤ Express an amount of more than 1l in ml 	<ul style="list-style-type: none"> ➤ Compare information in line graphs to answer questions ➤ Solve addition problems using information in line graphs to answer questions ➤ Solve difference problems using information in line graphs to answer questions 	

YEAR 5 : SUMMER 1: Overview and Teaching Steps

WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
4 Place Value	3 Fractions	4 Measures Time	4 Fractions Decimals	4 Addition & Subtraction	6 Multiplication & Division
Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit	Compare and order fractions whose denominators are all multiples of the same number.	Solve problems involving converting between units of time.	-Round decimals with two decimal places to the nearest whole number and to one decimal place. - Read, write, order and compare numbers with up to three decimal places.	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.	Recognise and use square numbers and cube numbers, and the notation for square ² and cubed ³ .
<ul style="list-style-type: none"> ➤ Revise reading and writing numbers to 1000 ➤ Read all numbers from 1000 to 50,000 in numerals ➤ Read all numbers from 1000 to 1,000,000 in numerals ➤ Recognise the value of each digit up to 1,000,000 ➤ Know and use the terms: ones, tens, hundreds, ten thousands, hundred thousand and million correctly ➤ Partition any number up to 1,000,000 showing the value of each digit 	<ul style="list-style-type: none"> ➤ Compare and order fractions with the same denominator. ➤ Compare and order fractions with denominators of 2, 4, 8. ➤ Compare and order fractions with denominators of 5, 10. ➤ Convert fractions with different denominators to have a common denominator. ➤ Order two different fractions with different denominators that are multiples of the same number. ➤ Order more than two different fractions with different denominators that are multiples of the same number. 	<ul style="list-style-type: none"> ➤ Solve a range of problems involving all units of time 	<ul style="list-style-type: none"> ➤ Round a number with two decimal places to the nearest whole number. ➤ Round a number with two decimal places to the nearest number with one decimal place. ➤ Given 3 numbers with three decimal places, place in order (smallest to largest and vice versa). ➤ Given 5 numbers with three decimal places, place in order (smallest to largest and vice versa). 	<ul style="list-style-type: none"> ➤ Identify the number of steps in a problem ➤ Identify the operations to be used ➤ Solve problems and check accuracy using estimation and rounding to check reasonableness of answer 	<ul style="list-style-type: none"> ➤ Know, by heart, the square of all numbers between 2 and 12. ➤ Know why a square number is called a square number by drawing squares ➤ Use the symbol ² accurately. ➤ Explain the relationship between the square of a number and the square root of a number. ➤ Knowing the square of a number, use the inverse to calculate the square root. ➤ Use the symbol ³ accurately.

YEAR 5 : SUMMER 2: Overview and Teaching Steps

WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
5 Place Value	5 Addition & Subtraction	5 Fractions Decimals	5 Measures	5 Geometry	Consolidate and Assess
Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10000 or 100000	Consolidate Addition and Subtraction using columnar addition and subtraction	Recognise the percent symbol (%) and understand that per cent relates to 'number of parts per hundred' and write percentages as a fraction with denominator 100, and as a decimal.	Understand and use approximate equivalences between metric units and common imperial units such as Inches, pounds and pints.	Consolidate and revise all Year 5 learning associated with geometry to include work on angles, translations and shape	Start this week by revising the learning covered in Year 5 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 5. Analyse the results and use information to help focus the intervention pre-teaching sessions, as needed, for the following year.
<ul style="list-style-type: none"> ➤ Round any number up to 10,000 to the nearest 10 ➤ Round any number up to 10,000 to the nearest 100 ➤ Round any number up to 10,000 to the nearest 1,000 ➤ Round any number up to 100,000 to the nearest 10 ➤ Round any number up to 100,000 to the nearest 100 ➤ Round any number up to 100,000 to the nearest 1,000 ➤ Round any number up to 100,000 to the nearest 10,000 ➤ Round any number up to 1,000,000 to the nearest 10 ➤ Round any number up to 1,000,000 to the nearest 100 ➤ Round any number up to 1,000,000 to the nearest 1,000 ➤ Round any number up to 1,000,000 to the nearest 10,000 ➤ Round any number up to 1,000,000 to the nearest 100,000 	<p>Revise:</p> <ul style="list-style-type: none"> ➤ Adding numbers with up to 5-digits with no exchanging ➤ Adding numbers with up to 5-digits with exchanging ➤ Subtracting numbers with up to 5-digits with no exchanging ➤ Subtracting numbers with up to 5-digits with exchanging 	<ul style="list-style-type: none"> ➤ Know what the % symbol stands for. ➤ Know that percent deals with a number or amount out of 100. ➤ Write % of amounts. ➤ Know that 50% is $50/100 = \text{one half} = \frac{1}{2}$. ➤ Know that 0.5 = 50% ➤ Know that 25% is $25/100 = \text{one quarter} = \frac{1}{4}$. ➤ Know that 0.25 = 25% ➤ Know the percent values of all tenths. ➤ Know the percent values of all fifths. ➤ Know the percent values of all quarters. 	<ul style="list-style-type: none"> ➤ Know the approximate number of metres in 1 mile ➤ Know the approximate relationship between inches and cm ➤ Know the approximate relationship between a pound and a gram ➤ Know the approximate relationship between a pint and a litre ➤ Carry out a range of approximate conversion calculations using above 	<p>Revise:</p> <ul style="list-style-type: none"> ➤ Reflecting a shape and re-plot ➤ Translating a shape and re-plot ➤ Describing the properties of the reflected and/or translated shape – evidencing that the shape and size has not changed ➤ Estimating, comparing and measuring angles in drawings ➤ Identifying acute, obtuse and reflex angles ➤ Using a protractor to measure angles ➤ Using a protractor to draw angles 	

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:
Multiplication & Division

- Multiply and divide numbers mentally drawing upon known facts.
- Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
- Establish whether a number up to 100 is prime and recall prime numbers up to 19.

Circle the prime numbers in this set of numbers

24 13 25

11 7 9

Complete these very rapidly:

6×7

$14 \div 2$

8×9

$72 \div 8$

12×6

$90 \div 10$

$45 \div 5$

8×7

What are the factors of the following numbers?

24

36

48

60

72

84

Autumn 2: Week 2: Practice and Consolidation

Multiplication & Division: -Multiply and divide numbers mentally drawing upon known facts. Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. Establish whether a number up to 100 is prime and recall prime numbers up to 19.

Teaching Sequence	Oral and Mental Activities Examples:	Pencil and Paper Activities Examples:																												
<ul style="list-style-type: none">➤ Use mental applications to multiply numbers making use of multiplication tables up to 12x12.➤ Use mental applications to divide numbers making use of multiplication tables up to 12x12.➤ Describe what a prime number is➤ Describe what a prime factor is➤ Describe what a composite number is➤ Explain how to work out whether a number is a prime number.➤ Recall all prime numbers to 19.	<ul style="list-style-type: none">• Remind pupils of the term factor and what it stands for.• Introduce the concept of a prime number and help pupils to establish full understanding of the term.• Use the term composite as it relates to numbers that are not prime numbers.• Check that pupils know all prime numbers to 19 by chanting them regularly alongside their times tables.	<p>Multiply 2-digit numbers by x2 to x12, using the following method: $16 \times 7 = (10 \times 7 = 70) + (6 \times 7 = 42) = 70 + 42 = 112$</p> <table><tr><td>$18 \times 8$</td><td>$15 \times 7$</td><td>$26 \times 9$</td><td>$25 \times 5$</td></tr><tr><td>$24 \times 8$</td><td>$32 \times 8$</td><td>$27 \times 6$</td><td>$23 \times 9$</td></tr></table> <p>Divide 3-digit numbers by x2 to x12, using the following method: $147 \div 7 = (140 \div 7 = 20) + (7 \div 7 = 1) = 21$</p> <table><tr><td>$128 \div 8$</td><td>$225 \div 9$</td><td>$138 \div 6$</td><td>$119 \div 7$</td></tr><tr><td>$232 \div 8$</td><td>$234 \div 9$</td><td>$210 \div 6$</td><td>$287 \div 7$</td></tr></table> <p>Describe a prime number. List all prime numbers to 20. Describe a composite number. List 5 composite numbers between 20 and 50.</p> <table><tr><td>If $7 \times 6 = 42$, what is 70×6?</td><td>If $8 \times 9 = 72$, what is 80×9?</td></tr><tr><td>If $4 \times 8 = 32$, what is 40×8?</td><td>If $7 \times 7 = 49$, what is 70×7?</td></tr><tr><td>If $9 \times 3 = 27$, what is 90×3?</td><td>If $8 \times 5 = 40$, what is 80×5?</td></tr><tr><td>If $7 \times 6 = 42$, what is 700×6?</td><td>If $8 \times 9 = 72$, what is 800×9?</td></tr><tr><td>If $4 \times 8 = 32$, what is 400×8?</td><td>If $7 \times 7 = 49$, what is 700×7?</td></tr><tr><td>If $9 \times 3 = 27$, what is 900×3?</td><td>If $8 \times 5 = 40$, what is 800×5?</td></tr></table>	18×8	15×7	26×9	25×5	24×8	32×8	27×6	23×9	$128 \div 8$	$225 \div 9$	$138 \div 6$	$119 \div 7$	$232 \div 8$	$234 \div 9$	$210 \div 6$	$287 \div 7$	If $7 \times 6 = 42$, what is 70×6 ?	If $8 \times 9 = 72$, what is 80×9 ?	If $4 \times 8 = 32$, what is 40×8 ?	If $7 \times 7 = 49$, what is 70×7 ?	If $9 \times 3 = 27$, what is 90×3 ?	If $8 \times 5 = 40$, what is 80×5 ?	If $7 \times 6 = 42$, what is 700×6 ?	If $8 \times 9 = 72$, what is 800×9 ?	If $4 \times 8 = 32$, what is 400×8 ?	If $7 \times 7 = 49$, what is 700×7 ?	If $9 \times 3 = 27$, what is 900×3 ?	If $8 \times 5 = 40$, what is 800×5 ?
18×8	15×7	26×9	25×5																											
24×8	32×8	27×6	23×9																											
$128 \div 8$	$225 \div 9$	$138 \div 6$	$119 \div 7$																											
$232 \div 8$	$234 \div 9$	$210 \div 6$	$287 \div 7$																											
If $7 \times 6 = 42$, what is 70×6 ?	If $8 \times 9 = 72$, what is 80×9 ?																													
If $4 \times 8 = 32$, what is 40×8 ?	If $7 \times 7 = 49$, what is 70×7 ?																													
If $9 \times 3 = 27$, what is 90×3 ?	If $8 \times 5 = 40$, what is 80×5 ?																													
If $7 \times 6 = 42$, what is 700×6 ?	If $8 \times 9 = 72$, what is 800×9 ?																													
If $4 \times 8 = 32$, what is 400×8 ?	If $7 \times 7 = 49$, what is 700×7 ?																													
If $9 \times 3 = 27$, what is 900×3 ?	If $8 \times 5 = 40$, what is 800×5 ?																													

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

Multiplication & Division: -Multiply and divide numbers mentally drawing upon known facts. Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. Establish whether a number up to 100 is prime and recall prime numbers up to 19.

Teaching Sequence

- Use mental applications to multiply numbers making use of multiplication tables up to 12x12.
- Use mental applications to divide numbers making use of multiplication tables up to 12x12.
- Describe what a prime number is
- Describe what a prime factor is
- Describe what a composite number is
- Explain how to work out whether a number is a prime number.
- Recall all prime numbers to 19.

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

Starting from 1, name the 6th prime number when counting to 100.
 Starting from 5, name the 6th prime number when counting on towards 100.
 Starting at 90, name the 4th prime number when counting backwards from 90.
 Starting at 2, name the 10th composite number you will say when counting on towards 100.
 Starting at 90, name the 5th composite number you will say when counting back.

Create a grid with numbers on the coordinates.
 In each square put a multiplication problem which has to derive from x2 to the x12 tables, eg, 60 x 7 or 400 x 5 or 450 ÷ 9.
 Work in groups of 4, each in turn has 1 minute to answer as many as they can.
 Another partner gives the coordinates and the idea is to respond as rapidly as possible.
 Each of the group creates their own grid and they play on each one in turn.

Make a list of all the prime numbers to 50.
 Make a table as shown and show at least two multiples of the prime numbers.

Prime no	Multiples

	A	B	C	D	E	F
6	60 x 7					
5			700 ÷ 7			
4				400 x 5		
3						
2						
1						

Autumn 2: Week 2: Working at greater depth

Multiplication & Division: -Multiply and divide numbers mentally drawing upon known facts. Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. Establish whether a number up to 100 is prime and recall prime numbers up to 19.

Teaching Sequence

- Use mental applications to multiply numbers making use of multiplication tables up to 12x12.
- Use mental applications to divide numbers making use of multiplication tables up to 12x12.
- Describe what a prime number is
- Describe what a prime factor is
- Describe what a composite number is
- Explain how to work out whether a number is a prime number.
- Recall all prime numbers to 19.

Activities for pupils working at greater depth:

Board Game

Create a board game with 10 x 10 squares. In each square, put the numbers 1 to 100. Use a dice with numbers 1 to 6. In turn, throw the dice and move to the next number which has the number thrown as a factor. Take turns and the idea is to reach 100 as quickly as possible. Having played the game once try to make the rules more interesting but it needs to have reference to multiplication and division.

Always, Sometimes or Never

- Is it always, sometimes or never true that multiplying a number always makes it bigger?
- Is it always, sometimes or never true that prime numbers are odd?
- Is it always, sometimes or never true that when you multiply a whole number by 9, the sum of its digits is also a multiple of 9?
- Is it always, sometimes or never true that a square number has an even number of factors?

Add some additional statements.

Missing Digits

What goes in the missing space?

$$12 \blacksquare 2 \div 6 = 212$$

$$14 \blacksquare 4 \div 7 = 212$$

$$22 \blacksquare 3 \div 7 = 321 \text{ r } 6$$

$$323 \times \blacksquare 1 = 13243$$

Ancient Egypt

When building a model of an Ancient Egyptian pyramid, pupils were trying to work out how many bricks they would need. Each of the 4 sides of the pyramid started with 15 bricks at the base. The row after the base would need 13 bricks, the row after 11 and then 2 less for each row thereafter.

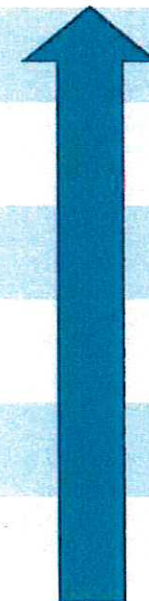
- Work out how many rows there are altogether (show your workings).
- Work out how many bricks they required to complete the pyramid (Show your workings).

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.

Multiplication & Division: -Multiply and divide numbers mentally drawing upon known facts. Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. Establish whether a number up to 100 is prime and recall prime numbers up to 19.

	Me	My Teacher
Can you quickly work out multiplication facts that have derived from x2 to x12 tables, eg, $70 \times 5 = 350$?		
Can you very rapidly say what all the prime numbers to 19 are?		
Can you describe what a composite number is?		
Can you describe what a prime number is?		
Do you feel confident when dealing with the inverse of multiplication facts, eg, how many 7s in 42?		
Are you very secure and confident when answering a multiplication fact taken from the x2 to the x12 tables?		



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.

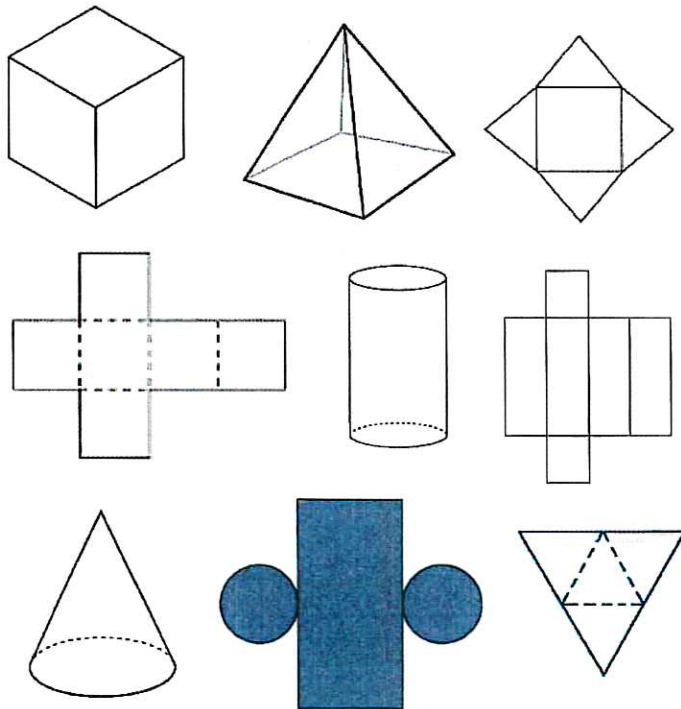
Name _____

Spring 2: Week 2

Objective:
Geometry

- Identify 3D shapes, including cubes and other cuboids, from 2D representations
- Use the properties of rectangles to deduce related facts & find missing lengths & angles.

Name these 3D shapes



Draw shapes with accuracy

Draw a square with sides of 5cm

Draw an equilateral triangle with a sides of 6cm

Spring 2: Week 2: Practice and Consolidation

Geometry: -Identify 3D shapes, including cubes and other cuboids, from 2D representations
- Use the properties of rectangles to deduce related facts & find missing lengths & angles.

Teaching Sequence

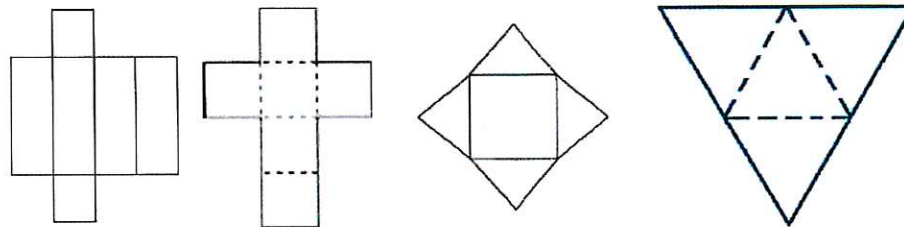
- Identify 3D shapes from 2D images
- Calculate missing lengths and angles using known facts

Oral and Mental Activities Examples:

- Remind pupils of the learning already covered in previous years about 2D and 3D shapes.
- Use 3D shapes with pupils and ensure that they know the names of each of the 3D shapes.
- Look at a range of nets and remind pupils of the terms associated with nets and 3D shapes.
- Remind pupils about the learning covered in Autumn1 about drawing angles and using a protractor.
- Help pupils to set out and draw angles very accurately.

Pencil and Paper Activities Examples:

Look at these nets, make a drawing of their equivalent 3D shapes:



Draw a number of squares that have the following sides:

10cm

5cm

15cm

8cm

Ensure that all angles are very accurate.

- Draw a rectangle that has 2 sides of 10cm and two sides of 8cm.
- Draw an equilateral triangle that has sides of 10cm.
- Draw a right-angled triangle that has one side of 6cm and another side of 8cm.
- Draw a triangle that has one side of 10cm; one angle of 45° and one angle of 60° .
- Draw the following angles: 65° ; 80° ; 110° .

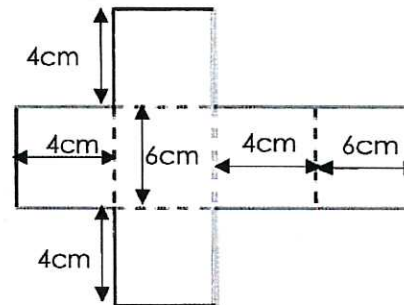
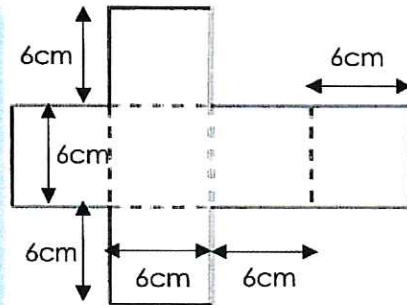
Spring 2: Week 2: Mastering this Objective – Deeper Understanding

Geometry: -Identify 3D shapes, including cubes and other cuboids, from 2D representations
- Use the properties of rectangles to deduce related facts & find missing lengths & angles.

Teaching Sequence

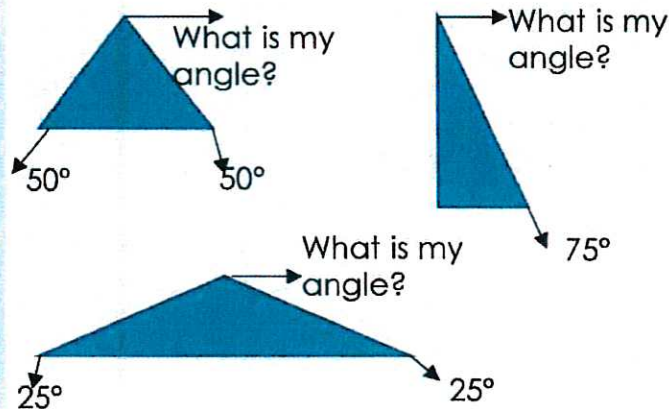
- Identify 3D shapes from 2D images
- Calculate missing lengths and angles using known facts

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



Look carefully at each of these two nets. Although they look similar they make different 3D shapes. Firstly, make up the two shapes shown following the dimensions as set out. Name them, in relation to 3D shapes.

Knowing what you already know about triangles, work out the missing angles.



Knowing what you know about rectangles, work out the following sides.

My perimeter is 34cm
Two of my sides measure 5cm What do my other 2 sides measure?

My area is 50cm².
My perimeter is 30cm.
What do my sides measure?

My area is 48cm².
Two of my sides measure 6cm. What do my other 2 sides measure?

Spring 2: Week 2: Working at greater depth

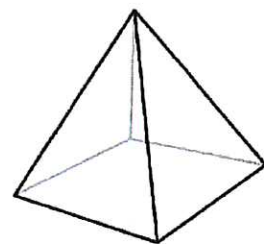
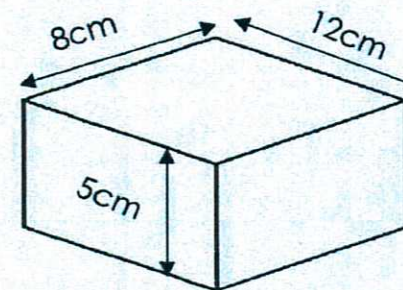
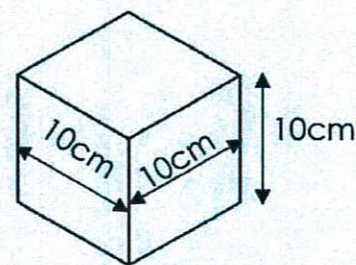
Geometry: -Identify 3D shapes, including cubes and other cuboids, from 2D representations
- Use the properties of rectangles to deduce related facts & find missing lengths & angles.

Teaching Sequence

- Identify 3D shapes from 2D image
- Calculate missing lengths and angles using known facts

Activities for pupils working at greater depth:

Look at the two 3D shapes below. The measurements are set out with them. Create the nets that would make these two 3D shapes



Now do the same with a triangular based pyramid.

This square-based pyramid has a base that is 10cm x 10cm. Each of the triangles is an equilateral triangle. Create the net and make a square based pyramid.

Work me out

I am a right-angled triangle. I have an area of 24cm^2 . What are the lengths of 2 of my sides?

I am a triangle I have one angle of 65° and another angle of 35° . What is my third angle?

I am a square and my area is 25cm^2 , what is my perimeter?

Think of some more questions you could create related to your knowledge of triangles and rectangles.

Spring 2: Week 2: Assessment

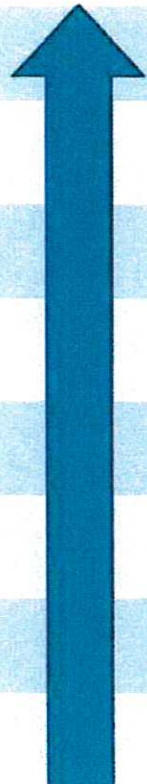
The grid below helps to identify the journey pupils make towards mastering this objective. It can be used by the teacher to keep an on-going check on progress or more likely placed in the pupils' books so that they can keep their own checks.

Geometry: -Identify 3D shapes, including cubes and other cuboids, from 2D representations
- Use the properties of rectangles to deduce related facts & find missing lengths & angles.

Me

My
Teacher

Can you draw a given angle using a protractor and label it appropriately?		
Can you draw a triangle to a given set of angles and sides?		
Can you draw an isosceles triangle accurately given the length of side and the base?		
Can you draw a right-angled triangle when given the lengths of sides?		
Can you draw an equilateral triangle with a given length?		
Can you draw a rectangle accurately having been given the length and breadth?		
Can you draw a square accurately having been given the length of the side?		
Can you recognise 3D shapes from their nets?		



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 **Decimals:** Recognise the percent symbol (%) and understand that per cent relates to 'number of parts per hundred' and write percentages as a fraction with denominator 100, and as a decimal.

Complete the missing values

Percentage (%)	Decimal Fraction	Fraction		Percentage (%)	Decimal Fraction	Fraction	
50%						3/4	
25%						5/6	
33%						3/10	
	0.3					1/4	
	0.6					2/9	
	0.75					4/10	
	0.2					7/8	

Summer 2: Week 3: Practice and Consolidation

Fractions: Decimals: Recognise the percent symbol (%) and understand that per cent relates to 'number of parts per hundred' and write percentages as a fraction with denominator 100, and as a decimal.

Teaching Sequence

- Know what the % symbol stands for.
- Know that percent deals with a number or amount out of 100.
- Write % of amounts.
- Know that 50% is $50/100 = \text{one half} = \frac{1}{2}$.
- Know that 0.5 = 50%
- Know that 25% is $25/100 = \text{one quarter} = \frac{1}{4}$.
- Know that 0.25 = 25%
- Know the percent values of all tenths.
- Know the percent values of all fifths.
- Know the percent values of all quarters.

Oral and Mental Activities Examples:

- Introduce pupils to the symbol '%'.
 - Link the word 'cent' to 100 and mention its Roman origins if that helps them to remember.
- Link percentage with decimal fractions and proper fractions.
- Use cards with examples of each, ie, 50%; $\frac{1}{2}$; 0.5.
- Ensure pupils are secure with percentage values related to tenths.
- Then ensure pupils know that 25% is a quarter and that 75% is three-quarters.

Pencil and Paper Activities Examples:

Find 10% of the following amounts:

£300	450Kg	45Litres	670 metres	£240
£345	675Kg	120Litres	855 metres	£3498

Complete the chart:

Decimal Fraction	Proper Fraction	Percentage
0.25		
	$\frac{1}{10^{\text{th}}}$	
		30%
0.75		
	$\frac{7}{10^{\text{th}}}$	

Find 20% of the following amounts:

£350	650Kg	145Litres	870 metres	£290
£375	675Kg	150Litres	805 metres	£3598

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

Fractions: Decimals: Recognise the percent symbol (%) and understand that per cent relates to 'number of parts per hundred' and write percentages as a fraction with denominator 100, and as a decimal.

Teaching Sequence

- Know what the % symbol stands for.
- Know that percent deals with a number or amount out of 100.
- Write % of amounts.
- Know that 50% is $50/100 = \text{one half} = \frac{1}{2}$.
- Know that $0.5 = 50\%$
- Know that 25% is $25/100 = \text{one quarter} = \frac{1}{4}$.
- Know that $0.25 = 25\%$
- Know the percent values of all tenths.
- Know the percent values of all fifths.
- Know the percent values of all quarters.

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

Which is more?

20% of 200 or 25% of 180?

30% of 200 or 75% of 100?

10% of 560 or 90% of 50

Explain your reasoning.

I have 19%; how much more do I need to add to it to make it the same as 0.2?

I have 28%; how much do need to take away to make it the same as one quarter?

I have 78%; how much do I need to add to it to make the same as $\frac{4}{5}$ th?

I have 95%; how much do I need to take away to make it the same as 0.9?

Finding percentage of the same amounts:

	10%	20%	50%
£34			
450m			
560Kg			
£750			
50 litres			

Jimmy has 150 football cards. He says he will give his best friend, Raja, 20% of them. How much will he give Raja?

Helen has 350 pence. She gives 30% to Sally. How much has Helen left?

Hindi lives on a farm which has 320 cows. He takes 40% of the cows to market to sell. How many cows are left on the farm?

Summer 2: Week 3: Working at greater depth

Fractions: Decimals: Recognise the percent symbol (%) and understand that per cent relates to 'number of parts per hundred' and write percentages as a fraction with denominator 100, and as a decimal.

Teaching Sequence

- Know what the % symbol stands for.
- Know that percent deals with a number or amount out of 100.
- Write % of amounts.
- Know that 50% is $50/100 = \text{one half} = \frac{1}{2}$.
- Know that 0.5 = 50%
- Know that 25% is $25/100 = \text{one quarter} = \frac{1}{4}$.
- Know that 0.25 = 25%
- Know the percent values of all tenths.
- Know the percent values of all fifths.
- Know the percent values of all quarters.

Activities for pupils working at greater depth:

Shopping Trip

Harry and Gail went shopping.
Harry spent 20% of his money and was left with £20.
Gail spent 50% of her money and was left with £15.
Which of the two had most money in the first place?

Testing Time

In a test all questions were worth the same amount of marks.
There were 25 questions altogether.

The results were as follows:

Mark 92%	Phili 72%	Hamiz 92%
Frank 88%	Jane 60%	Henry 100%
Norman 52%	Tariq 48%	Delia 76%

How many questions did each of the pupils get right?

Order!! Order!!

Put these sets of numbers in the correct order, starting with the largest.

7/10 0.73 7/100 0.073 71%

9/10 0.91 9/100 0.093 92%

Explain your thinking.

Attendance

Here is the weekly attendance for 6 classes in school. Each class has 30 children.

Class 1	- 96%
Class 2	- 98%
Class 3	- 90%
Class 4	- 92%
Class 5	- 88%
Class 6	- 100%

Work out how many days absence was recorded in each class.
Explain your reasoning.

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: Decimals: Recognise the percent symbol (%) and understand that per cent relates to 'number of parts per hundred, and write percentages as a fraction with denominator 100, and as a decimal.

	Me	My Teacher
Do you know percentage value of all tenths; fifths; quarters and eighths?		
Do you know percentage value of all tenths; fifths; quarters and eighths?		
Do you know percentage value of all tenths; fifths; quarters and eighths?		
Do you know percentage value of all tenths; fifths; quarters and eighths?		
Do you know percentage value of all tenths; fifths; quarters and eighths?		
Do you know what the symbol % stands for?		

