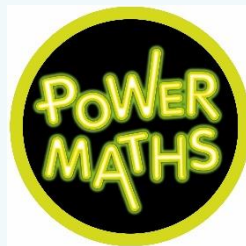# Woodfield Primary School

Mathematics Planning Progression – Power Maths

Maths at Woodfield Primary School

Our vision in maths is for all pupils to become confident, competent and resilient mathematicians who relish the challenge of maths, and have a sense of enjoyment and curiosity about the subject. We aim to provide a curriculum that is accessible for all, will maximise the development of every child's ability and provide the opportunity for all children to fulfil their potential in maths. It is our aim to prepare children to recognise structures within maths helping to develop their fluency and knowledge of 'how the maths works.' We aim to promote a love of maths in all children by ensuring that all pupils:

- become fluent in the fundamentals of maths through varied and frequent practice so pupils develop conceptual understanding and the ability to recall knowledge rapidly and accurately
- develop an understanding of their own metacognition through a focus on providing opportunities for them to plan what they are going to do when faced with a maths problem, monitor how well they are doing as they try to solve and evaluate how well they did once they have solved it or not
- use their understanding to reason mathematically including explaining, justifying or providing evidence using mathematical language
- make the relevant links to how maths can be applied in everyday life. Maths is taught across the school in daily maths lessons and through cross-curricular links within our topics.

We use the 'Power Maths' scheme of work to ensure all pupils become fluent in the fundamentals of mathematics, reason mathematically and can solve problems by applying their mathematics to a variety of problems. When solving problems, we want our children to:

- make links to the fluency as this is highly connected and is how children develop their conceptual and procedural fluency
- use and compare different approaching and strategies
- interrogate and use their existing knowledge

At Woodfield Primary, we believe it is very important for every child to establish a secure foundation in mental calculation and to be able recall number facts. To promote the importance of this, all children participate in regular retrieval through activities designed to help children by revisiting previous learning and embedding their understanding. In the teaching of maths in our school, we seek to consider not only the importance of understanding the content being delivered but also the ways in which we teach it, the common misconceptions and the most appropriate models. In our teaching of the subject, we consider a 'learning journey' that can focus on one objective over one lesson or a series of lessons. The learning journey enables all children to make progress using concrete, visual and abstract approaches including application and reasoning opportunities for all children at the level at which they are working. Through this journey, we not only value the importance of understanding the content being delivered but also the ways in which to teach it, the common misconceptions and the most appropriate models. We endeavour to ensure that our maths curriculum provides children with an opportunity to see the value of the subject and its role in everyday life, and give them the confidence and motivation to further develop their skills into the next stage of their education, life experiences and career selections.

Power Maths and Mastery

Power Maths makes mastery practical and achievable by providing the structures, pathways, content, tools and support needed.

To develop mastery in maths children need to be enabled to acquire a deep understanding of maths concepts, structures and procedures, step by step. Complex mathematical concepts are built on simpler conceptual components and when children understand every step in the learning sequence, maths becomes transparent and makes logical sense. Interactive lessons establish deep understanding in small steps, as well as effortless fluency in key facts such as tables and number bonds. The whole class works on the same content and no child is left behind – children are supported to keep up, not catch up.

Power Maths:

Builds every concept in small, progressive steps.

- Is built with interactive, whole-class teaching in mind.
- Provides the tools needed to develop growth mindsets.
- Helps check understanding and ensure that every child is keeping up.
- Establishes core elements such as intelligent practice and reflection

The *Power Maths* approach

Everyone can!

Founded on the conviction that every child can achieve, *Power Maths* enables children to build number fluency, confidence and understanding, step by step.

Child-centred learning

Children master concepts one step at a time in lessons that embrace a Concrete-Pictorial-Abstract (C-P-A) approach, avoid overload, build on prior learning and help them see patterns and connections. Same-day intervention ensures sustained progress.

Continuing professional development

Embedded teacher support and development offer every teacher the opportunity to continually improve their subject knowledge and manage whole-class teaching for mastery.

Whole-class teaching

An interactive, whole-class teaching model encourages thinking and precise mathematical language and allows children to deepen their understanding as far as they can.

5

Nursery

Autumn	Spring	Summer
Number- cardinality, composition, subitising and counting.	Number- cardinality, composition, subitising and counting.	Number- cardinality, composition, subitising and counting.
Patterns.	Patterns.	Measure.
Shape.	Shape.	Positional language.
	Measures.	Time.

Nursery: Objectives- From NCETM Progression of Skills document.

Number- cardinality, composition, subitising and counting:
- Counting: saying number words in sequence: - Counting: tagging each object with one number word.   - Counting: knowing the last number counted gives the total so far.   - Explore Numeral meanings.   - Conservation: knowing that the number does not change if things are rearranged (as long as none have been added or taken away)   - To recognise a regular arrangement on how many are in a group without counting them to 2.   - To recognise small amounts when they are not in a regular arrangement e.g a handful of objects.   - Part–whole: identifying smaller numbers within a number (conceptual subitising – seeing groups and combining to a total to 2)   - Number bonds: knowing which pairs make a given number within play and using contextual knowledge.   - To recognise a regular arrangement on how many are in a group without counting them to 3.   - Part–whole: identifying smaller numbers within a number (conceptual subitising – seeing groups and combining to a total to 3).   - CARDINALITY AND COUNTING – to 10 and beyond.   - Understand numbers 1-3 in depth.
Patterns:
- To see and talk about a AB pattern.   - To continue an AB Pattern   - To see and talk about an ABC Pattern.   - To continue an ABC Pattern.   - To talk about and identifies the patterns around me. For example: stripes on clothes, designs on rugs and wallpaper.   - To use informal language like 'pointy', 'spotty', 'blobs' etc.   - To be able to follow and make own patterns like stick, leaf, stick, leaf.
Shape:
- To identify 2d shapes.   - To talk about and identify their properties.   - To select a shape that I need and talk about my reasons.   - To count how many sides a circle has.   - To count how many long sides a rectangle has.

• To count how many short sides a rectangle has.
• To identify 3D shapes.
• To talk about and identify properties of 3D shapes.
• To select a shape and talk about my reasons.
Measures:
• To make comparisons between objects relating to size, length.
• Make comparisons between objects relating to weight and capacity.
Positional language:
• To use positional language in my play.
• To understand and use words/signs such as, in, under, behind, in front, beside, next to and use them in my play
• To understand position through words alone – for example, "The bag is under the table," – with no pointing.
• To be able to tell you a familiar route I know.
• To discuss routes and locations, using words like 'in front of' and 'behind'.
Time:
• To begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...

Nursery Autumn Term

Autumn
Number- cardinality, composition, subitising and counting.
• Counting: saying number words in sequence:
• Counting: tagging each object with one number word.
• Counting: knowing the last number counted gives the total so far.
• Explore Numeral meanings.
• Conservation: knowing that the number does not change if things are rearranged (as long as none have been added or taken away)
• To recognise a regular arrangement on how many are in a group without counting them to 2.
• To recognise small amounts when they are not in a regular arrangement e.g a handful of objects.
• Part–whole: identifying smaller numbers within a number (conceptual subitising – seeing groups and combining to a total to 2)
• Number bonds: knowing which pairs make a given number within play and using contextual knowledge.
Patterns.
• To see and talk about a AB pattern.
• To continue an AB Pattern
Shape.
• To identify 2d shapes.
• To talk about and identify their properties.
• To select a shape that I need and talk about my reasons.
• To count how many sides a circle has.
• To count how many long sides a rectangle has.
• To count how many short sides a rectangle has.

Nursery Spring Term

Spring
Number- cardinality, composition, subitising and counting.
- I can recognise small amounts when they are not in a regular arrangement e.g a handful of objects.   - Part–whole: identifying smaller numbers within a number (conceptual subitising – seeing groups and combining to a total to 2)   - Number bonds: knowing which pairs make a given number within play and using contextual knowledge.   - I can recognise a regular arrangement on how many are in a group without counting them to 3.   - Part–whole: identifying smaller numbers within a number (conceptual subitising – seeing groups and combining to a total to 3).
Patterns.
- To see and talk about an ABC Pattern.   - To continue an ABC Pattern.
Shape.
- To count how many sides a circle has.   - To count how many long sides a rectangle has.   - To count how many short sides a rectangle has.   - To identify 3D shapes.   - To talk about and identify properties of 3D shapes.   - To select a shape and talk about my reasons.
Measures.
To make comparisons between objects relating to size, length.

Nursery Summer Term

Summer
Number- cardinality, composition, subitising and counting.
- CARDINALITY AND COUNTING – to 10 and beyond.   - Understand numbers 1-3 in depth.
Measure.
Make comparisons between objects relating to weight and capacity.
Positional language.
- To use positional language in my play.   - To understand and use words/signs such as, in, under, behind, in front, beside, next to and use them in my play   - To understand position through words alone – for example, "The bag is under the table," – with no pointing.   - To be able to tell you a familiar route I know   - To discuss routes and locations, using words like 'in front of' and 'behind'.
Time.
To begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...

Reception

Autumn	Spring	Summer
Number and place value - numbers to 5	Number and place value – numbers to 10	Number: addition and subtraction – counting on and counting back
Number and place value – comparing groups within 5	Number and place value – comparing numbers within 10	Number and place value – numbers to 20
Geometry: properties of shape – 2D and 3D shapes	Number: addition and subtraction – addition to 10	Number: multiplication and division- numerical patterns
Number: addition and subtraction - change within 5	Number and place value – measure. Length, height, distance, weight	Geometry: properties of shape – composing and decomposing shapes
Number: addition and subtraction – number bonds within 5	Number: addition and subtraction – number bonds to 10	Number and place value – measure. Volume and capacity
Geometry: properties of shape – spatial awareness	Number: addition and subtraction - subtraction	**Optional** Number: addition and subtraction - sorting
	Geometry: properties of shape - exploring patterns	**Optional** Measurement - time

Reception Objectives- Statuary ELGS

Number – number and place value
• Have a deep understanding of number to 10, including the composition of each number; • Subitise (recognise quantities without counting) up to 5;
Number – addition and subtraction
▪ - Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.
Number – multiplication and division
▪ Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.
Number Fractions
▪ Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.
Measurement- Non statutory- NCETM Progression of skills document.
▪ Comparing indirectly ▪ Recognising the relationship between the size and number of units. ▪ Show awareness of comparison in estimating and predicting. **Time:** • Beginning to use time to sequence events. • To sequence different things that happen in the school day. • To use the vocab yesterday and tomorrow when describing events. • To name and order the days of the week. • Begin to tell the time to o'clock.
Geometry – properties of shapes- Non statuary. NCETM Progression of skills document.
▪ Showing awareness of properties of shape. ▪ I can name and identify the properties of a 2d shape- Recap.

- I can name and identify the properties of a 3d shape.
- Developing an awareness of relationships between shapes,
- I can talk about what shapes I can see inside another shapes.
- I can talk about and recognise shapes within shapes.

Geometry – position and direction- Non Statuary. NCETM Progression of skills document.
- Explore the language of direction when exploring bee bot and map work through World Wide adventures topic- build on positional language from Nursery.

Reception Autumn Term

Number and place value - numbers to 5
- start to count to 3 and back from 3. Link the skill of counting 3 concrete objects to the pictorial representation of 3, and then to the abstract numerals 1, 2 and 3
- build on knowledge of counting to 3, by counting to 4. Link the skill of counting 4 concrete objects to the pictorial representation of 4, and then to the abstract numeral 4. The five frame is introduced for the first time.
- count to 5 using the counting principles developed in previous learning. Represent numbers up to 5 in concrete and pictorial ways as well as linking an amount to the numerals 1, 2, 3, 4 and 5

Number and place value – comparing groups within 5
- compare groups of identical objects using the language more, fewer and less. Identical objects are compared in different orientations, and include equal-quantity groups to prompt more creative thinking about how identical groups can be compared.
- compare two groups of non-identical objects saying which group of objects has more, fewer or the same. Build on learning from the previous week, matching objects to compare quantities, but focusing on matching non-identical objects to draw out the misconception that objects must be the same to compare them

Geometry: properties of shape – 2D and 3D shapes
- focus on properties of 3D shapes through hands on exploration and play
- introduce the names of 2D shapes and some of the words to describe their properties. Children will see common 2D shapes shown in different orientations and be encouraged to look for examples of 2D shapes in the world around them.

Number: addition and subtraction – change within 5
- learn about one more within 5. They will use role play and *first, then, now* story structures to explore adding one more. Children will learn to recognise that the next number they count is one more than the previous number
- learn about finding one less than a given number within 5 using concrete objects and pictures to help them. Children will use role play and *first, then, now* stories to explore one less. Crossing out, not rubbing out, should be used when representing one less pictorially

Number: addition and subtraction – number bonds within 5
- children will be introduced to the vocabulary of whole and part, and practise the concept of breaking a whole into parts using a part-whole model

Geometry: properties of shape – spatial awareness
- children will develop their vocabulary to describe the position of objects. They will look at items from different viewpoints and draw representations of the items they see

Number and place value: numbers to 10
- count up to 8 objects and show them using concrete representations, including the ten frame. Children are introduced to counters as a representation of an amount for the first time
- count to 10. They will be introduced to the numbers 9 and 10 and use the ten frame to scaffold their counting to 10.

Number and place value: comparing numbers within 10
- Children will compare numbers up to 10. They will focus on comparing groups of objects where the objects differ in size.

Number: addition and subtraction – addition to 10
- Children will develop confidence in using the part-whole model, being able to identify the whole and the parts in different orientations and understanding that the combined parts make the whole. The key vocabulary altogether is introduced as a term to describe the combined parts

Number and place value: measure. Length, height, distance, weight
- Children will be introduced to length, height and distance. They use the words longer, shorter and taller to compare length. Children will focus on lining up objects to compare them and begin to explore non-standard units of measurement
- Children will be introduced to the concept of weight. They may already have some previous understanding of the meaning of heavy and light objects. They will begin to compare two items and learn how balance scales show which item is lighter or heavier

Number: addition and subtraction – number bonds to 10
- Children will explore number bonds to 10 using a variety of representations. Children will progress from seeing concrete representations to pictorial representations (counters), finally using counters on a ten frame to show all number bonds to 10. They will answer 'how many altogether 'and 'how many more' questions
- Children will explore all the different ways to make 10 on a part-whole model, and gain confidence with the concept and vocabulary of parts and wholes: that the whole can be made up of two or more parts, and that the parts are combined to make the whole

Number: addition and subtraction - subtraction
- children will continue exploring subtraction, now looking specifically at the number bonds to 10. These are shown using counters and the part-whole model, which have both been used before. Children begin to work with subtraction number bonds, following the 'missing part' structure

Geometry: properties of shape - exploring patterns
- Children will focus on recognising, continuing and building simple patterns. Children will have the opportunity to learn about AB patterns specifically. They will be encouraged to discover that patterns can be created using various shapes, colours, sizes, actions and sounds
- children will focus on recognising, continuing and building more complex patterns. Children will have the opportunity to learn about ABB and AAB patterns specifically. They will be encouraged to discover that patterns can be formed using various shapes, colours, sizes, actions and sounds

Number: addition and subtraction – counting on and counting back
- Children will learn how to count on from a given number in order to add. Children will use the *first, then, now* structure to identify what number they are counting on from, and how many they are counting on
- Children will learn how to count back from a given number in order to subtract. Children will use the *first, then, now* structure in order to identify what number they are counting back from, and how many they are counting back

Number and place value – numbers to 20
- Children will focus on counting forwards and backwards to and from 20. Children will explore one more and one less than numbers to 20, as well as comparing numbers. During this unit, children will also have the opportunity to represent numbers within 20

Number: multiplication and division- numerical patterns
- Children will explore what is meant by doubling and will learn to recognise and represent doubles to double 5 in a range of contexts
- Children will focus on halving quantities by sharing into two equal groups. They will make links to the fact that halving is the opposite, or inverse, of doubling
- Children will continue their work on numerical patterns to explore odd and even numbers in familiar contexts. They will use their understanding of equal groups to identify odd and even numbers

Geometry: properties of shape – composing and decomposing shapes
- children will explore how shapes can be composed and decomposed and be able to recognise that a shape can have other shapes within it, just as a number can. Children will explore the attributes of shapes through many hands-on activities while discovering, describing, proving and predicting. They will experience building a combination of figures as a single new figure

Number and place value – measure. Volume and capacity
- Children will use simple everyday language to compare volume and capacity using the terms *full*, *empty*, *nearly full* and *nearly empty* in the context of liquids (water) and solids (sand)

Optional
Number: addition and subtraction – sorting
- Children will focus on similarities and differences in sets of objects found in the classroom. Children will sort objects into two groups based on size, colour and shape. They will discover that groups can be sorted in different ways and into more than two groups.

Optional
Measurement - time
- children will be introduced to the concept of times of the day and the order of events in a day. They will begin to order familiar events using clues from pictures and will be introduced to the idea that the clock tells the time of the day, without having to read the clock

Year 1 overview

Week	Term		
	Autumn	**Spring**	**Summer**
1	Unit 1: Numbers to 10 (14 lessons)	Unit 6: Numbers to 20 (12 lessons)	**Unit 11: Multiplication and division** (9 lessons)
2			
3			**Unit 12: Halves and quarters** (4 lessons)
4	Unit 2: Part-whole within 10 (7 lessons)	Unit 7: Addition and subtraction within 20 (11 lessons)	**Unit 13: Position and direction** (5 lesson)
5			**Unit 14: Numbers to 100** (6 lessons)
6	Unit 3: Addition within 10 (4 lessons)	Unit 8: Numbers to 50 (7 lessons)	
7	Unit 4: Subtraction within 10 (8 lessons)		**Unit 15: Money** (3 lessons)
8		Unit 9: Introducing length and height (4 lessons)	**Unit 16: Time** (5 lessons)
9	Unit 5: 2D and 3D shapes (5 lessons)	Unit 10: Introducing weight and volume (7 lessons)	
10			
11			
12			

Year 1 Objectives

Number – number and place value
- count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number   - count, read and write numbers to 100 in numerals;   **count in multiples of twos**, fives and tens   **given a number, identify one more and one less** (under 100)   - identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least   **read and write numbers from 1 to 20 in numerals** and words.
Number – addition and subtraction
- read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs   **represent and use number bonds and related subtraction facts within 20**   - add and subtract one-digit and two-digit numbers to 20, including zero   - solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$.
Number – multiplication and division
solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.
Number Fractions
- recognise, find and name a half as one of two equal parts of an object, shape or quantity   - recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.
Measurement
compare, describe and solve practical problems for: - lengths and heights [for example, long/short, longer/shorter, tall/short, double/half]   - mass/weight [for example, heavy/light, heavier than, lighter than]   - capacity and volume [for example, full/empty, more than, less than, half, half full, quarter]

- time [for example, quicker, slower, earlier, later]

measure and begin to record the following:
- lengths and heights
- mass/weight
- capacity and volume
- time (hours, minutes, seconds)
- recognise and know the value of different denominations of coins and notes
- sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]
- recognise and use language relating to dates, including days of the week, weeks, months and years
- tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.

Geometry – properties of shapes

- recognise and name common 2-D and 3-D shapes, including:
- 2-D shapes [for example, rectangles (including squares), circles and triangles]
- 3-D shapes [for example, cuboids (including cubes), pyramids and spheres].

Geometry – position and direction

- describe position, direction and movement, including whole, half, quarter and three quarter turns.

Year 1 Autumn Term

Number – place value
Numbers to 10 (14 lessons)
What to teach:
- be able to recognise and explain different ways of sorting objects and that a single group of objects can be sorted in multiple ways
- relate the amount of objects to the correct number in digits and the correct number in words
- represent numbers using objects such as cubes or counters, focussing on more abstract objects rather than pictures or objects of real-life things.
- count objects from a larger group
- develop understanding of counting by counting on from any given starting number; link the skill of counting concrete materials to the abstract numerals
- learn to find one more than a given number; investigate further the place value of numbers from 0 to 10 and consider what 'one more' means.
- use their knowledge and understanding of counting forwards to 10 to help them count backwards from 10
- learn to find one less than a given number. They; investigate further the place value of numbers from 0 to 10 and consider what 'one less' means
- compare groups of objects; identify, when given two groups of objects, whether one group has more objects than the other
- use the and = signs to compare two groups of objects; explain their comparisons using the correct mathematical language.
- compare more abstract numbers where they are not given countable objects; choose the best representation or resource to help them compare.
- compare three or more groups of objects and order them in both ascending and descending order.
- recognise and use the representation of a number line to help answer questions based on all of the learning in this unit.

End of unit check – numbers to 10

Number – addition and subtraction
Part-whole within 10 (7 lessons)
What to teach:

- see that a whole group can be made up of two (or more) parts; build on their knowledge of counting or subitising objects in a group.
- that a number can be partitioned into two parts using a part-whole model; explore that numbers can be partitioned in different ways.
- build on part-whole knowledge by writing a part-whole as an addition number sentence. For each number in the sentence, understand what the number represents
- consolidate learning on number sentences; explore related facts, understand the term 'fact family' and are able to write one down for a part-whole model.
- start to look at number bonds to 10; understand the term 'bond' and write down number bonds.
- Learn about number bonds within 10; learn strategies for organising thinking and begin to spot patterns
- find and represent number bonds to 10 by finding a missing part

End of unit check – part-whole within 10

Number – addition and subtraction
Addition within 10 (4 lessons)
What to teach:

- combine two parts into a whole and understand how the part-whole model represents addition; make links between concrete representations, part-whole models and abstract addition calculations.
- be able to find a total by counting on from one amount rather than having to start at 0.
- find solutions to simple word and picture problems involving additions to 10
- use what they have learnt about addition to solve missing number problems; think about addition and parts and wholes to help solve these problems rather than be formally introduced to subtraction at this stage

End of unit check – addition within 10

Number – addition and subtraction
Subtraction within 10 (8 lessons)
What to teach:

- work out simple 'how many are left?' subtractions within 10 by crossing out
- work out simple 'how many are left?' subtractions within 10 by using part-whole models and ten frames; use the minus symbol
- find two parts of a whole by breaking up a total; find one part by thinking about the whole and the other part
- continue to find a missing part from the whole and the other part; use a part-whole model and sentence scaffolds to help complete subtractions.
- find four addition and four subtraction facts from the same context; see the = sign in different parts of number sentences and be able to explain the meaning of each part of the number sentences
- calculate subtraction number sentences using a number line to count back from the bigger number.
- add or subtract 1 or 2 using a number line to help them; draw on their knowledge of addition and subtraction from previous lessons in the unit
- answer a range of addition, subtraction and 'finding the difference' questions; make up their own word problems based on a pictorial prompt.

End of unit check – subtraction within 10
Consolidation/review
Autumn termly assessment

Year 1 Spring Term

Number – place value
Numbers to 20 (12 lessons)

- build on their learning of counting to 10 as they count to 20. They should be able to relate the number of objects to the correct number in digits and in words
- recap learning from earlier in the year as they develop their understanding of 10. It is important that children understand the structure of 10 and can subitise when it is presented in a standard representation
- develop their understanding of the numbers 11, 12 and 13 as 1 ten and some ones using the '10 and a bit' structure. They recognise that each number is made up as 1 whole ten and some extra ones.
- develop their understanding of the numbers 14, 15 and 16 as 1 ten and some ones, using the '10 and a bit' structure they saw in the previous lesson. They recognise that each number is made up of 1 whole ten and some extra ones.
- develop their understanding of 17, 18 and 19 as 1 ten and some ones using the '10 and a bit' structure they saw in the previous two lessons. They recognise that each number is made up of 1 whole ten and some extra 10s
- recognise that 20 is made up of 2 tens using representations they are familiar with. Children use their fingers, ten frames and a rekenrek to instantly recognise 20, and that it is clearly made up of 2 tens
- apply their counting skills to find one more and one less than any number within 20. Children have already been exposed to the language of more and less but this may need reinforcing with real-life examples. Representations such as ten frames are useful for showing one more and one less. Towers of cubes are particularly useful to show the one more pattern of consecutive numbers really clearly
- learn about the number line to 20. Children learned about the number line to 10 in the autumn term. All number lines will count in 1s in this lesson. Children will recap counting on from 0 to 20 when labelling a number line and can practise counting back, if reading from right to left. They will be able to consolidate their learning in the previous lesson as they clearly see that one more is the next number along the number line, whilst one less is the previous number
- n label number lines to 20. Children will recap counting from 0 to 20 when labelling a number line and can practise counting back if reading from right to left. They will be able to clearly see that one more is the next number along the number line, whilst one less is the previous number
- estimate for the first time. This is a new word for children to learn. Previously, they may have been asked to 'guess' and make predictions. To estimate is to roughly calculate or

judge a value, number or quantity. When beginning to estimate on a number line with children, take time to explore the half-way point. Where do they think half-way is? How do they know? What informal measurements could they use to check, such as steps in the playground?
- look at ways that they can compare numbers from 1 to 20
- order numbers and objects using vocabulary learned in previous lessons and the < and > signs.

End of unit check – numbers to 20

Number – addition and subtraction
Addition and subtraction within 20 (11 lessons)
- add numbers by counting on from one number. Children will know where to start the count and when to stop the count.
- add a 2-digit number to a 1-digit number by adding the ones
- find number bonds to 20. They will learn the link between number bonds to 10 and number bonds to 20
- understand what the word 'double' means and understand different ways doubles can be represented. Children will begin to learn their doubles up to 10 + 10
- find near double additions by considering doubles that they know. For example, they will use 5 + 5 to work out 5 + 6
- subtract by counting back. They will then go on to solve number sentences that have missing numbers
- count back across 10 to work out answers to subtraction problems
- answer questions worded 'how many more' and 'how many fewer'. They will compare quantities of objects to find the difference and represent this on a number line.
- answer questions worded as 'how many more' and 'how many fewer'. They will compare quantities of objects to find the difference and represent this on a number line
- solve a variety of missing number problems, such as 5 + ? = 9. They will use their knowledge of number bonds and fact families to work out the missing numbers
- use a range of strategies to find the solutions to word and picture problems involving addition and subtraction within 20.

End of unit check – addition and subtraction within 20

Number – place value
Numbers to 50 (7 lessons)
- recognise numbers to 50 and count objects to 50. They will develop their use of the number line beyond 20 and up to 50, and be able to count on or back from any number up to 50
- develop their knowledge of numbers between 20 and 50. They will be able to count on and back up to 50 and identify missing numbers in a sequence
- count objects by making groups of 10. They focus on just making 10s and know the count 10, 20, 30, 40 and 50
- learn that numbers up to 50 are made up of some 10s and some 1s through simple partitioning.
- learn how to count groups of objects in 10s and 1s where the 10s cannot always be seen
- explore different ways to represent numbers to 50, using objects such as counters and cubes, and mathematical models such as the part-whole model. They will see that a number is made up some 10s and 1s
- find one more and one less of any number to 50.

End of unit check – numbers to 50

Measurement
Introducing length and height (4 lessons)
- compare lengths and heights of objects and make accurate comparisons
- measure objects using non-standard units. This links measurement directly with number and counting
- learn that non-standardised objects can vary in size so a standard unit (centimetres) is needed. They will learn how to use a ruler correctly to measure length in centimetres accurately
- apply what they have learned about measuring length, as well as addition and subtraction, in order to solve problems

End of unit check – introducing length and height

Measurement
Introducing weight and volume (7 lessons)
- compare the mass of a range of familiar objects
- weigh objects using a variety of non-standard units.
- use a variety of non-standard units to compare and order objects by their mass
- compare a range of objects according to their capacity.
- estimate and measure the capacity of a range of containers, using a variety of non-standard units
- use a variety of non-standard units to compare and order objects according to their capacity
- use reasoning and understanding of number relationships to tackle a range of word problems involving mass and capacity

End of unit check – introducing weight and volume

Consolidation/review
Spring termly assessment

Year 1 Summer Term

Number – multiplication and division
Multiplication and division (9 lessons)
- explore counting on and back in 2s
- count on and back in 10s. They will investigate the patterns this count creates using different concrete, pictorial and abstract representations
- explore counting on and back in 5s, to 50. They will explore the patterns that exist when counting in 5s
- explore counting on and back in 5s, to 50. They will explore the patterns that exist when counting in 5s
- build on their understanding of equal groups and begin adding equal groups together to find a total
- learn to recognise, understand and create simple arrays. They will link this representation to their learning about repeated addition
- learn about the meaning of the word 'double'. Using familiar representations, they will develop their understanding of what a double is and how to find one

- develop their understanding of equal groups. They will recognise when groups are equal and when they are not, and how many equal groups are needed to make a whole number
- develop their understanding of equal groups. They will recognise when groups are equal and when they are not, and how many equal groups are needed to make a whole number

End of unit check – multiplication and division

Number – fractions
Halves and quarters (4 lessons)
- recognise what a half is. They will apply their knowledge by halving shapes and objects.
- find half of groups of objects, using their knowledge of sharing between two.
- recognise what a quarter is. They will apply their knowledge by finding quarters of shapes
- find a quarter of a small quantity using equal sharing.

End of unit check – halves and quarters

Geometry – position and direction
Position and direction (5 lessons)
- learn to describe turns as quarter, half, three-quarter or whole turns
- build on their knowledge of position and direction by using the words 'left' and 'right'. They will know which direction is left and which direction is right
- describe direction and lateral movement. They will learn how to follow and give instructions in order to reach a given goal.
- describe the position of an object based on its relation to other objects. They will apply their knowledge of left and right from the previous lessons
- learn to describe the order and position of objects using ordinal numbers. They will develop their understanding of the difference between a numeral representing the number of objects and the ordinal position of something

End of unit check – position and direction

Number – place value
Numbers to 100 (6 lessons)
- develop their ability to count numbers up to 100, supported by number tracks and 100 squares. This lesson focuses on knowing the count of numbers to 100, rather than the structure and representations
- count on in 10s, from 0 to 100. They recognise that these numbers all end in a 0
- consolidate their understanding of counting numbers in 10s and 1s and will learn to partition numbers
- explore the number line to 100. They will find missing numbers and place numbers in their correct position
- find one more and one less than any number between 1 and 100
- further consolidate their understanding of how to compare numbers up to 100. They will use the language of comparison accurately

End of unit check – numbers to 100

Measurement
Money (3 lessons)
- learn to recognise coins and become familiar with their relative values
- learn to recognise and compare banknotes
- find and compare the total value of small sets of coins

End of unit check – money

Measurement

Time (5 lessons)
- **use a range of language to sequence events in chronological order**
- **recognise and read the days of the week and know their correct order. They will use words such as 'today' and 'tomorrow'**
- **use a calendar to read and record information related to days and dates**
- **use an analogue clock face to tell the time to the nearest hour ('something o'clock').**
- **use an analogue clock face to tell the time to the nearest half hour ('half past something').**

Consolidation/review
Summer termly assessment

Week	Term		
	Autumn	Spring	Summer
1	Unit 1: Numbers to 100 (17 lessons)	Unit 5: Money (10 lessons)	Unit 10: Fractions (12 lessons)
2			
3		Unit 6: Multiplication and division (1) (8 lessons)	Unit 11: Time (5 lessons)
4			
5	Unit 2: Addition and subtraction (1) (13 lessons)	Unit 7: Multiplication and division (2) (10 lessons)	
6			Unit 12: Problem solving (11 lessons)
7			Unit 13: Position and direction (5 lessons)
8	Unit 3: Addition and subtraction (2) (12 lessons)	Unit 8: Length and height (5 lessons)	Unit 14: Statistics (7 lessons)
9			
10	Unit 4: Properties of shapes (12 lessons)	Unit 9: Mass, capacity and temperature (8 lessons)	
11			
12			

Year 2 Objectives

Number – number and place value
count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward   **recognise the place value of each digit in a two-digit number (tens, ones)**   - identify, represent and estimate numbers using different representations, including the number line   - compare and order numbers from 0 up to 100; use <, > and = signs   - read and write numbers to at least 100 in numerals and in words   - use place value and number facts to solve problems.
Number – addition and subtraction
- solve problems with addition and subtraction: - using concrete objects and pictorial representations, including those involving numbers, quantities and measures   - applying their increasing knowledge of mental and written methods   **recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100**   **add and subtract numbers using concrete objects, pictorial representations, and mentally, including:**   **a two-digit number and ones**   **a two-digit number and tens**   **two two-digit numbers**   **adding three one-digit numbers**   **show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot**   - recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.
Number – multiplication and division

- **recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers**
- calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
- **show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot**
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

Number Fractions

- **recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{2}{4}$, $\frac{3}{4}$ of a length, shape, set of objects or quantity**
- write simple fractions for example, $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$

Measurement

- choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels
- compare and order lengths, mass, volume/capacity and record the results using >, < and =
- recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- **find different combinations of coins that equal the same amounts of money**
- solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change
- compare and sequence intervals of time
- **tell and write the time** to five minutes, **including quarter past/to the hour** and draw the hands on a clock face to show these times
- know the number of minutes in an hour and the number of hours in a day.

Geometry – properties of shapes

- **identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line**
- **identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces**
- identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]
- compare and sort common 2-D and 3-D shapes and everyday objects.

Geometry – position and direction

- order and arrange combinations of mathematical objects in patterns and sequences
- use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise).

Statistics

- interpret and construct simple pictograms, tally charts, block diagrams and simple tables
- ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- ask and answer questions about totalling and comparing categorical data.

Number – number and place value

Numbers to 100

What to teach:

- rehearse key number skills in the range 0 to 20: counting up and down, reading and writing numerals, partitioning 2-digit numbers into 10 and some 1s. Also compare numbers as greater or less on a number line.
- count in multiples of 10 up to 100, using a variety of representations to support fluency and understanding (for example, that 5 tens make 50, 7 tens make 70, and 90 is made up of 9 tens)
- learn to count in 10s, then count on in 1s, in order to count a certain number of objects or items, already arranged into 10s and 1s
- count in 10s and 1s, to and from 2-digit numbers
- develop skills of counting in 10s and 1s, to form their own 10s and 1s, and represent and build an understanding of the number of 10s and 1s comprising a given 2-digit number
- learn to use a place value grid to show the value of digits within a 1- or 2-digit number
- develop understanding of the place value for 10s and 1s to partition 2-digit numbers
- partition 2-digit numbers flexibly, by finding multiple partitions of 10s and 1s
- build on partitioning skills to write a 2-digit number as an addition of 10s and 1s (for example 43 = 40 + 3)
- develop a deeper understanding of number lines, including number lines that do not show every number, only multiples of 10
- develop a deeper understanding of number lines, including number lines that do not start on 0, but start instead on a multiple of 10
- further develop understanding of number lines for representing numbers within the range 0 to 100
- develop understanding of comparing numbers; start to use understanding of place value to aid them in their comparisons
- continue developing their ability to compare numbers, using more abstract representations
- draw on skills in comparing and place value, and use them to find effective and efficient ways to order three or more 1- and 2-digit numbers
- learn to count forwards and backwards in 2s, 5s and 10s
- learn to count forwards and backwards in 3s.

End of unit check – numbers to 100

Number – addition and subtraction

Addition and subtraction (1) – 13 lessons

What to teach:

- focus on bonds within 20, using the part-whole diagram to help them see these visually. Find fact families and record known facts in different ways within addition and subtraction calculations
- explore strategies for learning number bonds and consider which facts they need to learn off by heart
- use known facts with 1s to determine other facts with corresponding multiples of 10
- use knowledge of number bonds to learn complements of 100 (e.g. 10 + 90, 20 + 80, 30 + 70)
- add and subtract 1s to or from a 2-digit number without exchanging, using number bonds to help them

- add two single-digit numbers that total more than 10, by breaking one number into two parts to bridge the 10
- deepen understanding and proficiency in adding two single-digit numbers by bridging 10
- add three numbers presented in a variety of ways, including concrete and pictorial representations; select the most appropriate resource to help them and rearrange the numbers to add efficiently
- add from a 2-digit number to the next multiple of 10, in order to prepare for learning how to do additions that bridge 10s
- add 2-digit and 1-digit numbers together, with the focus on bridging 10; represent this using ten frames and jumps on a number line
- learn how to subtract by crossing 10 (the range stays within 20, so the subtractions cross the 10 barrier)
- begin to build up understanding of how to subtract from 2-digit numbers more flexibly, by subtracting from a given multiple of 10
- build on subtraction skills to subtract across a multiple of 10

End of unit check – addition and subtraction (1)

Number – addition and subtraction
Addition and subtraction (2) – 12 lessons
What to teach:
- find 10 more and 10 less than a number and notice which digit changes during this process.
- build on what was learnt in the previous lesson; focus on addition and subtraction of more than 1 ten to and from a 2-digit number
- add two 2-digit numbers by adding the 10s and the 1s separately, and then recombining
- add a 2-digit number to another 2-digit number by first adding on more 10s and then adding on more 1s
- learn to subtract a 2-digit number from a 2-digit number by counting back in 10s, and then counting back in 1s (no crossing of tens in this lesson)
- build on the method from the previous lesson and begin to subtract 2-digit numbers with calculations that include crossing 10s
- answer questions worded 'how many more?' and 'how many fewer?'; compare quantities of objects to find the difference and represent this on a number line or bar model
- more formally link 'finding the difference' with subtraction, building on work from the previous lesson about finding 'how many more' or 'how many fewer'
- recognise that two calculations can be compared using the symbols =, < and >
- use their calculation skills to solve missing number problems such as ◯ + 12 = 25
- represent word problems using single bar models; use the words 'part' and 'whole' to help identify whether the calculation is addition or subtraction
- represent word problems using single bar models; use the words 'part' and 'whole' to help identify whether the calculation is addition or subtraction

End of unit check – addition and subtraction (2)

Geometry – properties of shape
Properties of shape - 12 lessons
What to teach:
- recognise and name 2D and 3D shapes and make links between them. They will begin to identify common features of different types of 2D and 3D shapes
- count the number of sides on 2D shapes and will learn to use this knowledge to categorise different shapes

- learn that vertices are points where two or more sides of a polygon meet. Children will learn that they can classify shapes by the number of vertices
- apply what they have learned about the properties of shapes in order to accurately draw 2D shapes
- explore reflective symmetry. They will learn to identify shapes and images that have reflective symmetry and identify where the line of symmetry lies
- draw on their previous learning about properties of 2D shapes in order to sort polygons by different criteria. This will include focusing on number of sides, number of vertices and reflective symmetry
- identify patterns involving 2D shapes. By isolating the pattern core, children will be able to identify missing terms
- count and describe the faces of 3D shapes. They will learn that a curved surface on a 3D shape is not classed as a face
- identify edges of a 3D shape as the line where two faces meet. They will learn to use the property of number of edges to describe 3D shapes.
- learn that vertices on a 3D shape are where three or more edges meet. They will then use this knowledge to help describe the properties of 3D shapes
- sort 3D shapes based on their properties. Children will apply their learning from the previous three lessons about 3D shapes
- make symmetrical patterns with 3D shapes. They will use what they know about symmetrical patterns to identify missing shapes and create their own

End of unit check – properties of shape
Autumn termly assessment

Year 2 Spring Term

Measurement
Money – 10 lessons
- learn the value of a range of coins and explore ways to find the total of different amounts
- learn the value of notes and find total amounts of notes, £2 and £1 coins
- count different amounts of money and record their answers in pounds and pence (separately)
- select the right combination of coins and notes for a given amount. Children will also find how much money is left over
- use different combinations of coins and notes to make the same amount of money
- compare amounts of money using the correct vocabulary and the ,< > signs and =
- find the total cost of given items. Children will add pounds and pence, but not cross the 100 boundary
- learn that £1 is equivalent to 100p. They will use different coins to make a value of £1
- work out how much change should be received after paying for something. There will be a focus on finding the difference between the cost and the amount paid
- use prior knowledge to solve two-step word problems

End of unit check – money

Number – multiplication and division
Multiplication and division (1) – 8 lessons

- understand that objects can be grouped together and that groups containing the same number of objects are equal groups. Children will make written sentences from these equal groups
- develop their skill in understanding the language of equal groups and apply it to drawing, arranging and making equal groups
- work out a total by counting equal groups through repeated addition
- write repeated addition and multiplication sentences to match a picture. Children will match sentences describing the number of equal groups with the correct multiplication and repeated addition sentences
- write calculations as multiplication number sentences to represent different equal grouping situations
- learn how to relate arrays to a multiplication sentence. Children will use arrays to fill in sentence scaffolds and make their own arrays
- use repeated subtraction to model division calculations. They will put numbers into equal groups using counters and show this on a number line
- learn another strategy for dividing by sharing a number equally into groups

End of unit check – multiplication and division (1)

Number – multiplication and division
Multiplication and division (2) – 10 lessons
- learn the 2 times-table in a number of contexts and they will work out 2 times-table multiplication sentences
- relate multiplication facts from the 2 times-table to dividing by 2. Children will say how many 'groups of 2' there are
- develop an understanding of how doubling and halving relate to multiplication and division by 2
- understand the difference between odd and even. They will tell if a number is odd or even by grouping it in 2s
- earn the 10 times-table in a number of contexts and make links to place value. They will reason about sentences involving × 10
- divide numbers by 10. They will link multiplication facts for the 10 times-table to dividing by 10 and show this on a number line
- learn the 5 times-table in a number of contexts. They will work out 5 times-table multiplication sentences using arrays, number lines and pictorial representations
- divide numbers by 5 by grouping and on a number line. They will link division facts to times-tables
- be able to represent division calculations using a bar model and using grouping
- be able to represent division calculations using a bar model and a sharing method.

End of unit check – multiplication and division (2)

Measurement
Length and height – 5 lessons
- use rulers to measure simple objects to the nearest centimetre
- estimate and measure a range of objects, using metres as a unit of measurement
- compare lengths measured in centimetres and metres
- order sets of lengths measured in centimetres or metres
- use a range of methods to solve word problems involving length and height

End of unit check – length and height

Measurement

Mass, capacity and temperature – 8 lessons

- use balance scales to compare the mass of two or more objects, and use chains of reasoning to order the mass of more than two objects
- explore the use of standard units of mass (grams), and how they can measure these using both balance scales and weighing scales
- be introduced to kilograms, their second standard unit of mass, and will explore measuring and estimating mass using both grams and kilograms
- explore, measure and compare volume and capacity
- explore and use millilitres (ml) as a standard unit of measuring capacity and volume
- be introduced to litres as a standard unit of measure, and will carry out a variety of calculations using litres
- read temperatures from a thermometer and use temperature to make simple comparisons and to carry out calculations
- apply their knowledge of counting in 2s, 5s and 10s to reading different scales on thermometers

End of unit check – length and height
Spring termly assessment

Year 2 Summer Term

Number – fractions

Fractions – 12 lessons

- talk about the difference between a whole and a part in different contexts. Children will match parts to the correct wholes and fill in sentence scaffolds to match parts and wholes
- identify equal parts of a whole in different contexts including shape, quantity, volume and money
- identify which objects have been split into two equal parts. They will be introduced to 1/2 as a written fraction with a numerator and a denominator
- find one half of different amounts of objects, shapes and numbers
- recognise shapes that have been split into four equal parts and will identify one quarter. They will split given shapes into quarters and will recognise which shapes do not show quarters
- find one quarter of different amounts by sharing them into four equal groups
- extend their understanding of fractions to consider thirds as three equal parts of one whole
- be introduced to non-unit fractions (fractions in which the numerator is not 1)
- learn that 1 2 and 2 4 are equivalent fractions. Children will prove this using physical resources and different numbers of objects
- apply their knowledge of unit and non-unit fractions to work out one quarter and three quarters of numbers up to 20
- learn about non-unit fractions becoming one whole.

End of unit check – fractions

Measurement

Time – 5 lessons

- recap their learning about measuring time. They will read and describe times to the hour and the half hour
- describe times using the vocabulary of 'quarter past' and 'quarter to'. They will confidently read and record times on an analogue clock
- continue to develop their ability to read an analogue clock by learning to read the five-minute intervals. They will link this to their prior learning about half past, quarter to and quarter past
- develop their understanding of how many minutes there are in an hour. They will use this understanding, and the representations of part-whole and bar models, to help them solve mathematical problems
- learn that there are 24 hours in a day. They will learn how there are morning and afternoon times, and use this to solve simple problems.

End of unit check – time

Number – addition and subtraction

Problem solving and efficient methods – 11 lessons

- solve money problems using a variety of addition and subtraction strategies
- make links between calculations to calculate unknown quantities, based on similarities and differences between the parts and the wholes
- become more familiar with the 100 square and use it to confidently count on and back in steps of 10 and 1 in addition and subtraction problems
- find multiple answers to the same questions and increase their confidence in choosing a starting point and using trial and improvement to work from it
- identify what they know from a question and use it to work out unknowns, rearranging number sentences as appropriate
- use what they know to calculate unknown quantities. Children will apply methods and strategies that they have learnt in previous lessons
- learn how to add or subtract a multiple of 10 to or from a number and then adjust to reflect the amount that should have been added or subtracted
- look at efficient methods for subtracting. They will be challenged to choose an appropriate method based on the question they are presented with
- solve a variety of different 1- and 2-step problems that will require appropriate calculation strategies
- solve multiplication and division problems. They will decide if a problem requires multiplication or division to solve it, using the bar model to help make their choice
- practise the four operations. They will solve problems with multiple steps and use the bar model to represent these steps

End of unit check – problem solving and efficient methods

Geometry – position and direction

Position and direction – 5 lessons

- children will use practical positional language to describe scenes or arrangements of items
- describe quarter, half and three-quarter turns around a point using the terms 'clockwise' and 'anticlockwise'
- describe quarter, half and three-quarter turns around a point using the terms 'clockwise' and 'anticlockwise'
- combine rotation and linear movement in order to follow or describe a designated path

- apply what they have learnt about rotation and position in order to complete and describe patterns

End of unit check – position and direction

Statistics

Statistics – 7 lessons
- learn how to read and construct tally charts
- interpret data which is presented in tables, and use this data to answer 1- and 2-step problems
- read, construct and interpret block diagrams
- construct pictograms from given data, showing that one symbol represents one item. They will also link them to tally charts
- read and interpret pictograms where one symbol represents one item. They will find totals and compare amounts
- read and construct pictograms in which symbols represent more than one item
- read and interpret pictograms that have symbols representing more than one item

End of unit check – statistics

Summer termly assessment

Year 3 overview

Week	Term		
	Autumn	**Spring**	**Summer**
1	**Unit 1: Place value within 1,000** (13 lessons)	**Unit 6: Multiplication and division (3)** (13 lessons)	**Unit 11: Fractions (2)** (8 lessons)
2			
3			**Unit 12: Money** (5 lessons)
4	**Unit 2: Addition and subtraction (1)** (10 lessons)	**Unit 7: Length and perimeter** (11 lessons)	**Unit 13: Time** (12 lessons)
5			
6			
7	**Unit 3: Addition and subtraction (2)** (13 lessons)	**Unit 8: Fractions (1)** (10 lessons)	**Unit 14: Angles and properties of shapes** (9 lessons)
8			
9	**Unit 4: Multiplication and division (1)** (5 lessons)	**Unit 9: Mass** (7 lessons)	**Unit 15: Statistics** (7 lessons)
10	**Unit 5: Multiplication and division (2)** (13 lessons)		
11		**Unit 10: Capacity** (6 lessons)	
12			

Year 3 Objectives

Number – number and place value
count from 0 in multiples of 3, 4, 8, 50 and 100   **find 10 or 100 more or less than a given number**   **recognise the place value of each digit in a three-digit number (hundreds, tens, ones)**   - compare and order numbers up to 1000   - identify, represent and estimate numbers using different representations   - read and write numbers up to 1000 in numerals and in words   - solve number problems and practical problems involving these ideas.
Number – addition and subtraction
add and subtract numbers mentally, including: **a three-digit number and ones**   **a three-digit number and tens**   **a three-digit number and hundreds**   **add and subtract numbers with up to three digits**, using formal written methods of columnar addition and subtraction   - estimate the answer to a calculation and use inverse operations to check answers   **solve problems, including missing number problems, using number facts, place value,** and more complex addition and subtraction.
Number – multiplication and division
recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables   **write and calculate mathematical statements for multiplication and division using the multiplication tables that they know,** including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods   **solve problems, including missing number problems, involving multiplication and division,** including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.
Number Fractions

- count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10
- **recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators**
- recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators
- recognise and show, using diagrams, equivalent fractions with small denominators
- add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$
- **compare and order unit fractions**, and fractions with the same denominators
- solve problems that involve all of the above.

Measurement

- measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)
- **measure the perimeter of simple 2-D shapes**
- add and subtract amounts of money to give change, using both £ and p in practical contexts
- **tell and write the time from an analogue clock**, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks
- estimate and read time with increasing accuracy to the nearest minute;
  - record and compare time in terms of seconds, minutes and hours;
  - use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight
- **know the number of seconds in a minute and the number of days in each month, year and leap year**
- compare durations of events [for example to calculate the time taken by particular events or tasks].

Geometry – properties of shapes

- draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them
- recognise angles as a property of shape or a description of a turn
- **identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle**
- identify horizontal and vertical lines and pairs of perpendicular and parallel lines.

Statistics

- interpret and present data using bar charts, pictograms and tables
- solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.

Number – number and place value
Place value within 1000 – 13 lessons
What to teach:
- recap representing and partitioning numbers to 100 using a variety of representations such as base 10 equipment and part-whole models. This will prepare for later learning in the unit.
- identify and label numbers within 100 on a number line. Children should be able to identify and label numbers made up of only 10s as well as numbers with both 10s and 1s
- Learn how to count in 100s from 0 to 1,000. Children will write the numbers in both numerals and words
- Represent numbers in place value grids using counters. Children will write numbers represented with counters in a place value grid
- Understand that a number up to 1,000 is made up of some 100s, some 10s and some 1s. Use base 10 equipment and part-whole models to represent numbers
- Build on understanding of 3-digit numbers and learn that they can be partitioned in different ways. Use base 10 equipment and part-whole models to represent 3-digit numbers.
- Represent numbers in place value grids using counters. Write numbers represented with counters in a place value grid
- Identify values and mark points on number lines that go up in 100s, 10s and 1s
- Begin to understand where numbers lie on a number line; identify numbers that lie between two points
- Find 1, 10 and 100 more or less than a given number (including cases that require an exchange); find the original number given the increase or decrease
- Compare two 3-digit numbers; be able to work out missing digits to make an inequality statement correct
- Order three or more numbers up to 3-digits; work out missing digits in lists of ordered numbers
- Count on and back in 50s from 0 to 1,000 and count from any multiple of 50; work out how many 50s there are in a number.

End of unit check – place value within 1000

Number – addition and subtraction
Addition and subtraction (1) – 10 lessons
What to teach:
- use knowledge of number bonds within 10 to add and subtract multiples of 100, up to 1,000
- add and subtract a 1-digit number to and from a 3-digit number, using understanding of place value, without being expected to cross 10s
- add and subtract multiples of 10 to and from a 3-digit number by using their knowledge of number bonds to add and subtract the 10s digits
- add a multiple of 100 to a 3-digit number by using knowledge of number bonds to add the 100s digits.
- explore patterns in addition and subtraction and the effect on different digits of adding or subtracting 1s, 10s or 100s. At this stage, calculations including exchanging are not required
- understand how to recognise additions where a 10 is crossed, and know how to use exchange of 10 ones for 1 ten
- develop understanding of adding 10s to a 3-digit number, including examples which require exchange of 10 tens for 1 hundred

- subtract a 1-digit number where the subtraction crosses a 10; understand how to exchange 1 ten for 10 ones
- subtract a multiple of 10 from a 3-digit number, including where they have to exchange 1 hundred for 10 tens.
- focus on using simple calculations to find the answer to more complex calculations. Use number bonds within 10 to break calculations down into more manageable steps and then use related facts to work out other calculations.

End of unit check – addition and subtraction (1)

Number – addition and subtraction
Addition and subtraction (2) – 13 lessons
What to teach:
- add two 3-digit numbers where no exchange is necessary. Use a written column method and begin with the 1s, then the 10s and then the 100s
- subtract a 3-digit number from another 3-digit number where no exchange is necessary; represent the subtraction as a written column subtraction
- add two 3-digit numbers where exchange may be necessary, and to recognise when it is or is not necessary
- build on the learning from the previous lesson to add 3-digit numbers where exchanges may be necessary in the 1s, 10s or both
- develop fluency with column subtraction of 3-digit numbers to include calculations where exchange is necessary across one or two columns
- further develop fluency with column subtraction of 3-digit numbers, to include calculations where an exchange is necessary across one or two columns
- develop written methods for addition, including exchange of 10s and 1s
- subtract using column methods with exchange where necessary
- make number bonds to 100 using a 100 square
- develop skills of estimation and approximation to allow simple checks of additions and subtractions; as rounding has not yet been learned, the approach builds on number sense and approximate position on a number line
- learn to use inverse operations and fact families as checking strategies; use them to help make appropriate calculations more efficient as mental strategies
- use single bar model to represent word problems that require addition or subtraction
- develop use of the bar model to include two bars to represent comparison and to tackle problems with two or more steps

End of unit check – addition and subtraction (2)

Number – multiplication and division
Multiplication and division (1) – 5 lessons
- recap their knowledge from Year 2 and be able to recognise equal groups. For any equal groups, children should be able to write down the associated multiplication fact, know how it links to repeated addition and know how to find the answer
- explore using arrays and finding corresponding multiplication sentences
- explore multiples of 2 and recognise that any number in the 2 times-table is a multiple of 2. They link this to their understanding of even numbers to see that all multiples of 2 are even
- build on their learning of multiples from the previous lesson and explore multiples of 5 and 10. They recognise that any number in the 5 times-table is a multiple of 5 and any number in the 10 times-table is a multiple of 5 and of 10

- answer sharing and grouping division questions. They should recognise the difference in context between the problems and understand whether this makes them a sharing or grouping problem

End of unit check – multiplication and division (1)

Number – multiplication and division
Multiplication and division (2) – 13 lessons
- start to understand what it means to multiply by 3. Children will see the link between repeated addition, counting up in 3s and multiplying by 3
- start to understand what it means to divide by 3. Children will see that a division sentence can be used to represent either equal grouping or sharing
- realise that the 3 times-table contains multiplication facts and they should be able to recall associated division facts from multiplication facts
- start to understand what it means to multiply by 4. Children will see the link between repeated addition, counting up in 4s and multiplying by 4
- start to understand what it means to divide by 4. Children will understand that division sentences can be used to represent either equal grouping or equal sharing
- focus on learning the 4 times-table and be able to recall associated division facts from multiplication facts. They will know how the 4 times-table can be derived from the 2 times-table
- start to understand what it means to multiply by 8. Children will use counting up in 8s to work out the answers to multiplications
- understand how they can divide a number by 8
- focus on learning the 8 times-table and associated division facts from multiplication facts. They will show that they know how the 8 times-table can be derived from the 2 and 4 times-tables
- solve simple one-step multiplication and division problems. They will recognise when they need to multiply and divide and will draw a simple bar model to represent the problem
- solve simple one-step multiplication problems. They will also begin to tackle solving simple two- and three-step multiplication and division problems that may involve an addition or a subtraction
- realise that some division problems leave a remainder. They will also realise that the greatest possible remainder is 1 less than the number they divide by
- continue to realise that some division problems leave a remainder. Children will learn to write the result of a division with a remainder more formally.

End of unit check – multiplication and division (2)
Autumn term assessment

Number – multiplication and division
Multiplication and division (3) – 13 lessons
- understand how to find multiples of 10 by counting in 10s. They will begin to understand what happens when you multiply 1- and 2-digit numbers by 10. Children will also work out how many 10s are in 3-digit multiples of 10
- use known multiplication facts to solve related multiplication problems, particularly involving multiplying by 10

- compare multiplication statements. They will build on their understanding of commutativity in multiplication to spot patterns and will make comparisons using the < and > signs
- use the expanded method to solve 2-digit numbers multiplied by 1-digit numbers. They will demonstrate a secure understanding of partitioning and place value in their calculations
- continue to use the expanded method to solve more complicated 2-digit number by 1-digit number multiplications requiring the exchange of ones into the tens column
- apply their understanding of place value to written methods for solving multiplications using the expanded method in column format. They will solve mixed problems, including those in context
- explore the link between multiplication and division. Children should be able to write down related division facts for a given multiplication fact and vice versa
- use their understanding of place value, partitioning and division to divide a 2-digit number by a 1-digit number
- continue to use their understanding of place value and division to divide 2-digit numbers by 1-digit numbers using partitioning, while using exchange to simplify calculations
- learn that some division calculations have a remainder. They will use concrete and pictorial methods to determine the remainder
- calculate the number of ways that n objects can be connected to m objects and will use the multiplication rule for correspondence problems
- solve mixed problems involving multiplication and division of 2-digit numbers
- use their understanding of all four operations to solve mixed multi-step problems

End of unit check – multiplication and division (3)

Measurement
Length and perimeter – 11 lessons
- measure using mixed units for the first time. They will accurately measure and record length using a combination of metres and centimetres
- measure accurately, using millimetres and centimetres. They will use a ruler accurately to measure different objects
- use their knowledge from the previous lessons in this unit to convert between measurements in mm, cm and m. They will know how many mm are in 1 cm and how many cm are in 1 m. They will use these facts to convert between measurements
- explore the equivalence between measurements given in centimetres and measurements given in metres and centimetres
- read lengths in centimetres and millimetres – converting between these units
- compare and order measurements given in millimetres, centimetres and metres
- find the totals of two or more lengths given in centimetres, metres or simple combinations of both units. They will convert answers into millimetres, centimetres or metres as appropriate
- use subtraction to find the difference between two lengths given in centimetres, metres or simple combinations of both units. They will convert answers into either centimetres or metres as appropriate
- measure the perimeters of a range of shapes in both centimetres and millimetres
- calculate perimeter in situations where side lengths are given but they cannot physically measure them for themselves
- solve one-step problems involving length. They will apply their learning from all previous lessons in this unit

End of unit check – length and perimeter

Number – fractions
Fractions (1) – 10 lessons

- learn and understand that the denominator of a unit fraction tells you the number of equal parts the whole is made up of
- compare and order unit fractions
- understand what the numerator of a non-unit fraction represents
- work out what two fractions they need to add together to make the whole
- compare and order non-unit fractions where the denominators are equal
- use number lines between 0 and 1 and understand what they increase by each time
- place fractions on a number line, remaining within the whole. They will recognise that the denominator represents the number of parts the number line must be partitioned into
- learn to recognise equivalent fractions with small denominators. They will use diagrams to represent equivalent fractions
- learn to recognise and show equivalent fractions with small denominators, predominantly represented on number lines
- continue to develop their ability to find equivalent fractions using proportional reasoning. Diagrams are used to build children's understanding of pattern and numerical reasoning

End of unit check – fractions

Measurement
Mass – 7 lessons

- recap work on number lines and explore their connection to scales on different measuring devices, such as weighing scales or jugs
- learn how to read a range of scales relating to mass, including those with missing intervals.
- learn how to read a range of scales in which kilograms and grams are mixed. They will also find midpoints between intervals
- learn how to convert amounts in grams to values in both kilograms and grams
- compare masses by ordering them on a number line and by using the < > and = signs
- add and subtract masses, which include mixed units, using a range of strategies. They will continue to convert between kilograms and grams
- use all of the knowledge and strategies they have learnt in this unit to solve problems involving mass

Measurement
Capacity – 6 lessons

- learn to measure volume in litres and in millilitres. They will learn how to read a variety of scales where only some of the divisions are labelled, drawing on their understanding of number, division and multiplication
- learn to read mixed units of capacity given in litres and millilitres and as 1 2 litres, and convert them to millilitres. They will also read scales showing amounts over 1 litre
- continue to learn how to convert between litres and millilitres, including mixed units, in the context of real-life scenario
- learn to compare capacities by first comparing the number of litres, then the number of millilitres. Children will also apply their knowledge of converting when comparing capacities given in different units
- know that 1 litre is the same as 1,000 millilitres and that 1 2 litre equals 500 millilitres. Children will be able to convert measurements between litres and millilitres within a litre, but focusing on fraction of litre conversions
- apply their learning from this unit to solve problems involving all four operations

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End of unit check – capacity

Spring term assessment

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Year 3 Summer Term

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Number – fractions
Fractions (2) – 8 lessons
- add two or more fractions with the same denominator
- learn to subtract fractions with the same denominator
- partition a whole into two (or more) fractions that have the same denominator
- learn to reason mathematically and solve problems by adding and subtracting fractions
- find a unit fraction of a set of objects. Using a bar model or strips of paper to fold, children will find these fractional amounts and begin to link finding fractions of amounts to dividing by the denominator
- find non-unit fractions of a set of objects. They will link dividing by the denominator and multiplying by the numerator in order to find the solution
- find non-unit fractions of a set of objects not shown visually and use given fractional amounts to calculate an unknown whole
- learn to reason mathematically, and solve problems involving fractions and money by adding and subtracting fractions

End of unit check – fractions (2)

Measurement
Money – 5 lessons
- learn the value of each coin and note and understand what these values represent. Children will answer questions that involve finding a total amount and express these amounts using the word 'and'
- convert between pounds and pence. They understand that 100 pence make one pound and can write an amount in pounds or pence from representations of coins
- add amounts of money that are given in pounds and pence
- subtract amounts of money that are given in pounds and pence. Children will also find the difference between two amounts of money
- find the change from a given coin or note

End of unit check – money

Measurement
Time – 12 lessons
- learn the Roman numerals from 1 to 12 and use this knowledge to read clock faces that have Roman numerals
- develop their ability to tell the time to 5 minutes and link this to prior knowledge of reading analogue clocks by reading the 5-minute intervals
- tell the time using 'minutes past' and 'minutes to' and using the 12-hour analogue clock. They will read and describe times to the nearest minute
- read times from digital clocks. They will be able to read the time as 'minutes past' and as 'minutes to'
- read times using analogue and digital clocks. They will recap their learning about measuring time and describe time using am and pm, or morning and afternoon or evening

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- learn what a year is and be able to explain why there is a leap year every four years. They will learn the number of days in each month
- be introduced to the 24 hours in a day including noon and midnight. They will think about the activities they spend time doing during a typical day, and the length of time they spend doing them.
- learn to find start and end times to the minute for different events
- learn to find a duration between two times, including using the 24-hour clock
- learn to compare durations of time
- learn to measure events (such as a race) in seconds
- choose the most appropriate unit of measure for different activities

End of unit check – time

Geometry – properties of shapes
Angles and properties of shapes – 9 lessons
- understand angles as a measure of turn. Children learn that a right angle is a quarter turn, two right angles make a half turn, and four right angles make a whole turn
- develop their understanding of right angles to include the measure of an angle in a shape. They learn the symbol that indicates a right angle and are introduced to the idea of perpendicular lines
- learn how to recognise angles that are greater than, equal to or less than a right angle. They are introduced to the terms acute and obtuse
- develop their ability to draw and measure accurately in centimetres and millimetres, and apply this to reasoning about 2D shapes
- learn to identify and draw horizontal and vertical lines.
- learn to identify and construct parallel and perpendicular lines
- apply their understanding of types of line and angle to the properties of 2D shapes
- identify and sort 3D shapes based on properties of faces, vertices and edges. They deepen their understanding of cubes and cuboids, and also describe the shapes and dimensions of faces of different 3D shapes
- learn to construct 3D shapes by considering their properties in relation to different construction materials

End of unit check – properties of shape

Statistics – 7 lessons
- interpret pictograms where each symbol is worth more than 1
- solve 1- and 2-step problems based on information that is presented in pictograms
- construct pictograms from a table of data
- read and interpret bar charts that have a range of scales
- solve a range of 1- and 2-step problems based on the interpretation of bar charts
- solve a range of 1- and 2-step problems based on the interpretation of bar charts
- interpret data that is presented in tables, and use this data to answer 1- and 2-step problems

End of unit check – statistics
Spring term assessment

Year 4 overview

Week	Term		
	Autumn	**Spring**	**Summer**
1	Unit 1: Place value – 4-digit numbers (1) (8 lessons)	Unit 6: Multiplication and division (2) (16 lessons)	Unit 11: Decimals (2) (7 lessons)
2			
3	Unit 2: Place value – 4-digit numbers (2) (8 lessons)		Unit 12: Money (6 lessons)
4		Unit 7: Perimeter (6 lessons)	
5	Unit 3: Addition and subtraction (16 lessons)		Unit 13: Time (5 lessons)
6		Unit 8: Fractions (1) (9 lessons)	Unit 14: Geometry – angles and 2D shapes (8 lessons)
7			
8		Unit 9: Fractions (2) (8 lessons)	Unit 15: Statistics (6 lessons)
9	Unit 4: Area (5 lessons)		
10	Unit 5: Multiplication and division (1) (12 lessons)	Unit 10: Decimals (1) (12 lessons)	Unit 16: Position and direction (6 lessons)
11			
12			
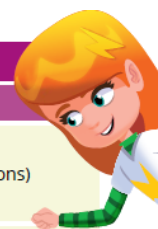
Year 4 Objectives

Number – number and place value
count in multiples of 6, 7, 9, 25 and 1000   **find 1000 more or less than a given number**   **count backwards through zero to include negative numbers**   **recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)**   - order and compare numbers beyond 1000   - identify, represent and estimate numbers using different representations   **round any number to the nearest 10, 100 or 1000**   - solve number and practical problems that involve all of the above and with increasingly large positive numbers   - read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.
Number – addition and subtraction
add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate   - estimate and use inverse operations to check answers to a calculation   **solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.**
Number – multiplication and division
recall multiplication and division facts for multiplication tables up to 12 × 12   **use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers**   - recognise and use factor pairs and commutativity in mental calculations   **multiply two-digit and three-digit numbers by a one-digit number using formal written layout**   **divide three digit numbers by a one-digit number using the formal written layout of short division**

- **solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.**

Number Fractions (including decimals)

- **recognise and show, using diagrams, families of common equivalent fractions**
- count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.
- **solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number**
- **add and subtract fractions with the same denominator**
- recognise and write decimal equivalents of any number of tenths or hundredths
- recognise and write decimal equivalents to $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}$
- **find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths**
- round decimals with one decimal place to the nearest whole number
- compare numbers with the same number of decimal places up to two decimal places
- solve simple measure and money problems involving fractions and decimals to two decimal places.

Measurement

- Convert between different units of measure [for example, kilometre to metre; hour to minute]
- **measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres**
- **find the area of rectilinear shapes by counting squares**
- estimate, compare and calculate different measures, including money in pounds and pence
- **read, write and convert time between analogue and digital 12- and 24-hour clocks**
- solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.

Geometry – properties of shapes

- compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes
- **identify acute and obtuse angles and compare and order angles up to two right angles by size**
- **identify lines of symmetry in 2-D shapes presented in different orientations**
- **complete a simple symmetric figure with respect to a specific line of symmetry.**

Geometry – position and direction

- **describe positions on a 2-D grid as coordinates in the first quadrant**
- describe movements between positions as translations of a given unit to the left/right and up/down
- plot specified points and draw sides to complete a given polygon.

Statistics

- **interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.**
- solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.

Number and place value
4-digit numbers (1) – 8 lessons
What to teach:
- rehearse the place value of 3-digit numbers and explore different ways to partition them; make the numbers using different equipment and representations and find the value of each digit
- rehearse finding the position of 3-digit numbers on a variety of number lines, including some real-life contexts
- count in 1,000s from 0 to 10,000, forwards and backwards and recognise multiples of 1,000 in different representations
- develop their understanding of place value by working with 4-digit numbers and understanding the place value of the 1,000s position
- further explore the value of each digit in a 4-digit number by partitioning into 1,000s, 100s, 10s and 1s
- explore partitioning 4-digit numbers in various ways, not necessarily just into 1,000s, 100s, 10s and 1s, in preparation for conceptual work with written calculation methods
- find 1,000 more or less than a given number, using knowledge of place value to help; recap learning on 10 and 100 more
- develop understanding of the relationship between 1,000s, 100s, 10s and 1s, and explore the concept of exchange more fully

End of unit check – 4-digit numbers (1)

Number and place value
4-digit numbers (2) – 8 lessons
What to teach:
- locate and identify multiples of 1,000, 100 and 10 on number lines
- identify numbers in a range between two multiples of 1,000, 100 or 10; identify the previous and next multiple of 1,000, 100 or 10 that a given number lies between
- develop knowledge of place value and comparison of numbers to make sensible estimates on a number line
- order 4-digit numbers, focusing on the value of the digits and using a place value grid to support understanding
- round 4-digit numbers to the nearest 1,000, building on work with finding previous and next multiples of 10, 100 and 1,000
- round 3- and 4-digit numbers to the nearest 100
- rounding to the nearest multiple of 10
- build on knowledge of rounding to 1,000, 100 and 10, including working out numbers that round to a particular degree of accuracy

End of unit check – 4-digit numbers (2)

Number – addition and subtraction
Addition and subtraction – 16 lessons
What to teach:
- use knowledge of place value to add and subtract 1, 10, 100 and 1,000 to and from 4-digit numbers.
- add 4-digit numbers using the column method (without exchanging), paired with a place value grid to ensure children have a deeper understanding
- add 4-digit numbers using the column method with an exchange in one column

- add 4-digit numbers using the column method with exchanges across more than one column
- subtract 4-digit numbers using the column method where there are no exchanges
- subtract 4-digit numbers using the column method where an exchange is required
- subtract 4-digit numbers using the column method where more than one exchange is required
- subtract 4-digit numbers using the column method with exchanges, when there is a zero in the column to be exchanged from
- consider different methods for solving calculations, thinking about how to work efficiently and accurately
- learn the equivalent difference method of subtraction
- learn to make choices about whether to round to the nearest 10, 100 or 1,000 and how to use that to decide if a calculation is accurate
- learn strategies for checking answers, using the inverse operation and estimating by rounding
- apply addition and subtraction strategies learnt previously to solve simple problems
- explore single bar models and comparison bar models to interpret and solve simple problems
- apply addition and subtraction strategies that they have learnt previously, to solve two-step problems
- continue to apply the addition and subtraction strategies previously learnt to solve multi-step problems

End of unit check – addition and subtraction

Measurement
Area – 5 lessons
- be introduced to the concept of the area of a 2D shape. They will measure this by counting non-standard units that fit within squares and rectangles
- begin to use squares as a standard unit of measuring the area of squares and rectangles
- find areas of more complex rectilinear shapes (including those drawn on squared grids) by counting squares
- be given opportunities to apply their understanding of the concept of area by making shapes with given areas
- learn how to compare shapes according to their areas

End of unit check – area

Number - multiplication and division
Multiplication and division (1) – 12 lessons

- learn to name and find multiples of 3 and non-multiples of 3
- learn what it means to multiply and divide by 6. They will use a range of strategies to support their understanding
- focus on learning their 6 times-table. Children should be able to recite it and also learn the associated multiplication and division facts
- understand how they can multiply and divide a number by 9. Children will make links to the 3 and 6 times-tables
- focus on learning their 9 times-table. Children will also be able to recall associated division facts from the related multiplication facts
- explore the relationship between multiples of 3, multiples of 6 and multiples of 9, and develop strategies to improve their own times-tables knowledge

- learn what it means to multiply and divide by 7. They will apply their knowledge to finding solutions involving real-life contexts.
- focus on learning their 7 times-table. Children should be able to recite it, and learn the associated multiplication and division facts
- focus on learning their 11 and 12 times-tables. Children should be able to recall them quickly, and also learn the associated multiplication and division facts
- earn how to multiply numbers by 0 and 1, finding out the rules and using visual representations to explain answers
- learn how to divide numbers by 1. They will also relate their divisions to the inverse (multiplications)
- earn to find more efficient ways to multiply. They will use the commutative properties of multiplication to calculate 'in a different order', such as 2 × 7 × 5 = 7 × 10, to increase their ability to calculate mentally

End of unit check – multiplication and division (1)

Autumn term assessment

Year 4 Spring Term

Number - multiplication and division
Multiplication and division (2) – 16 lessons
- learn to find and compare factor pairs of numbers and will show that they have found all the possible factor pairs of any given product
- explore multiplication and division by 10 and will identify what happens to the place value of the digits in a number when it is multiplied or divided by 10
- develop their understanding of place value to efficiently and accurately multiply and divide numbers by 100
- learn how to multiply by multiples of 10 and 100 using known facts and place value knowledge.
- learn how to divide multiples of 10 and 100 using known facts and place value knowledge
- learn to solve addition and multiplication problems. They will discover that multiplying a number by two numbers added together is the same as doing separate multiplications and then adding the answers (known as the distributive law)
- build on their understanding of using expanded methods to multiply a 2-digit number by a 1-digit number, in preparation for using a formal written layout (column method)
- start using the compressed, single-line (short) formal multiplication. They will progress to examples that require exchange of 1 ten, and then of more than 1 ten
- start multiplying 3-digit numbers by a 1-digit number. They will progress from no exchange to examples that require exchange of 1, then of more than 1
- solve a mixture of problems by using the formal written method. Bar models are used to reveal the structure of more complex problems
- consolidate their understanding of sharing, grouping and partitioning as methods of division. They will focus on learning how to divide a 2-digit number where the 10s digit and the 1s are divisible by the divisor (for example, 96 divided by 3, 48 divided by 4, 55 divided by 5).
- recap the concept of remainders in division and be able to solve division problems that leave a remainder

- divide a 2-digit number by a 1-digit number using flexible partitioning and by focusing on mental methods
- use partitioning to divide a 3-digit number by a 1-digit number
- solve more complex correspondence problems, working out how n objects relate to m objects, finding all solutions and noticing how to use multiplication to solve these problems
- focus on learning to simplify multiplications by finding factor pairs of 2-digit numbers and then using commutativity to help them to perform mental calculations.

End of unit check – multiplication and division (2)

Measurement
Length and perimeter – 6 lessons
- be introduced to the concept of a kilometre. They will extend their knowledge of converting between measurements to include converting between km and m.
- build on their knowledge of perimeter, which they were first introduced to in Year 3. They will initially find perimeter by counting square lengths around rectangles and squares drawn on grid
- develop their understanding of the perimeter of rectangles and squares through problem solving. They will find the width of a rectangle when given the perimeter and the length.
- extend their understanding of perimeter to include rectilinear shapes that are not rectangles or squares
- develop their understanding of perimeter by considering the perimeter of rectilinear shapes where not all the side measurements are given
- use their knowledge about the properties of polygons to calculate perimeters efficiently

End of unit check – length and perimeter

Number – fractions
Fractions (1) – 9 lessons
- learn to use mixed numbers to count beyond 1. They will learn that a mixed number has a whole part and a fraction part
- deepen their understanding of mixed numbers by partitioning them into a whole number and a fraction part.
- work with mixed numbers on the number line. They will use this to count up in fractional steps and to identify each whole and the fraction parts in between
- use their understanding about the nature of mixed numbers to compare and order them efficiently
- learn how to identify the total number of fraction parts in a mixed number and will apply this as they start to write mixed numbers as improper fractions
- identify improper fractions and convert them to mixed numbers with the aid of images and fraction strips
- use a fraction wall and fraction strips to identify equivalent fractions
- continue to find equivalent fractions. They will look at the relationship between the numerators and denominators of fractions
- simplify fractions, initially with the aid of images and then with abstract fractions

End of unit check – fractions (1)

Number – fractions

Fractions (2) – 8 lessons

- add and subtract fractions with the same denominator, including those where the answer is greater than 1. Children will write their answers as both improper fractions and mixed numbers, using visual aids such as fraction strips and number lines.
- add proper fractions to mixed numbers with the same denominator. They will use fraction strips and number lines to help them to visualise what is happening
- subtract proper fractions from mixed numbers with the same denominator by counting back with support from fraction strips and number lines
- subtract fractions from a whole number and explore different methods.
- apply their understanding of adding and subtracting fractions to solve problems
- solve problems involving adding and subtracting fractions
- calculate a fraction of an amount. They will use fraction strips to help them visualise the concept and then use their knowledge of finding a unit fraction of an amount to find non-unit fractions of an amount
- solve multi-step problem-solving questions involving finding a fraction of an amount and finding the whole

End of unit check – fractions (2)

Number – fractions (including decimals and percentages)

Decimals (1) – 12 lessons

- learn how to recognise tenths and represent them as fractions
- be introduced to the decimal point and how it can be used to write tenths as decimals. Children also count in tenths and record these as decimals
- build on their understanding of tenths and extend this to numbers greater than 1. They will explore the place value of numbers with one decimal place, using a place value grid
- learn how to place decimal numbers with tenths between two whole numbers on a number line.
- represent tenths as fractions and decimals on a number line extending beyond 1 and will count on and count back in tenths to solve problems in the context of measurement and length.
- understand what happens when you divide a 1-digit number by 10, making connections with tenths during this process
- build on their previous understanding and extend the concept to divide 2-digit numbers by 10
- understand that a hundredth as a fraction is 1/100 and will use a hundredths grid to make the connection between hundredths and tenths
- practise writing hundredths as a decimal and counting on and back in hundredths from a given number
- build on their understanding and recognise that a number with two decimal places has a number of tenths plus some hundredths. They will use counters on a place value grid to represent this
- divide 1- and 2-digit numbers by 100, building on their understanding of dividing by 10.
- divide numbers by 10 and 100 and see the connection between dividing by 10 and then 10 again and dividing by 100

End of unit check – fractions including decimals and percentages

Spring term assessment

Number – fractions (including decimals and percentages)

Decimals (2) – 7 lessons

- understand that given a number of tenths or hundredths they can make the number bond up to 1
- learn that a number with up to two decimal places can be made up of some 10s, 1s, tenths and hundredths
- find a range of different ways to partition a given decimal number
- compare decimal numbers by looking at the largest place value and then moving to the next largest place value
- order numbers with up to two decimal places
- round a decimal to the nearest whole number by looking at the tenths digit. They will place decimal numbers on a number line.
- represent fractions and decimals using a number line and a hundredths grid. They will learn the decimal equivalents for 1/2 , 1/4 and 3/4 .

End of unit check – decimals

Measure

Money – 6 lessons

- focus on the place value of coins and amounts when recording in pounds. Children will make links between fractions of a pound and converting to decimals with two decimal places
- add pence, crossing the pound boundary, and pounds and pence. Children will write totals as pence, pounds and pence, and with a decimal point
- identify, compare and put in order the most and least expensive items and amounts of money. Children will convert prices and amounts in a variety of notations into a common unit
- make estimates, look at differences between prices and work out how much money remains. Children will explore over and under estimates depending on how prices were adjusted
- solve problems involving pounds and pence. They will solve addition and subtraction problems and work out change
- use previously learnt strategies and methods to solve multi-step problems with money

End of unit check – money

Measure

Time – 5 lessons

- revise their understanding of the equivalences between years, months, weeks and days, applying their knowledge to convert between units of time
- revise their understanding of the equivalences between different units of time. They will apply their knowledge to convert between hours, minutes and seconds.
- convert between analogue and digital times
- convert between 12-hour and 24-hour times expressed on both analogue and digital clocks
- apply their knowledge of units of time to problem-solving contexts. They will use mathematical reasoning, choosing when and how to convert between units of time or between analogue and digital times in order to solve problem

End of unit check – time

Geometry – properties of shapes
Angles and 2D shapes – 8 lessons
- compare angles and identify acute, obtuse and right angles
- identify acute and obtuse angles, using what they already know about angles. They will compare the sizes of angles and use their comparisons to order them
- identify the three different types of triangles. They will understand the properties of scalene, isosceles and equilateral triangles in relation to their angles and the length of their sides
- name, describe and identify quadrilaterals, recognising their similarities and differences. They will use their knowledge to classify and compare quadrilaterals
- recognise the similarities and differences between regular and irregular polygons. They will use this vocabulary to help inform their reasoning about 2D shapes
- consolidate their learning about polygons and use it to help them solve shape problems and puzzles
- explore reflective symmetry. They will identify lines of symmetry within regular and irregular polygons
- complete symmetric patterns when the lines of symmetry are given. They will reason about how shapes are affected by different lines of symmetry

End of unit check – angles and 2D shapes

Statistics
Statistics – 6 lessons
- extend their knowledge of bar charts, tables and pictograms to interpret data with larger numbers and a wider range of scales
- use their knowledge of bar charts, tables and pictograms to answer increasingly complex problems, including those that involve differences and totals
- apply their data interpretation and analysis skills to a range of increasingly challenging problem
- read values from a line graph
- continue to explore line graphs, and will make statements and comparisons based on data presented in line graphs
- build on their understanding of statistics and interpreting data and draw their own line graphs from given information

End of unit check – statistics

Geometry – position and direction
Position and direction – 4 lessons
- describe relative positions on a map, initially without a grid and then with a grid. They will develop the understanding and skills that will be needed when numbered axes and coordinates are introduced in the next lesson
- use coordinates in the first quadrant to describe positions on a grid, using the conventional order and notation
- use coordinates to plot points in the first quadrant and to construct simple shapes by plotting their vertices. They will also plot points to complete shapes
- use the properties of shapes and points to help them make constructions on the coordinate grid.
- carry out simple translations on a coordinate grid, following instructions given in the form 'left/right, up/down'
- work out the translations (expressed in the form 'right/left, up/down') that are needed to move from one position on the coordinate grid to another

End of unit check – position and direction

Summer term assessment

Week	Term		
	Autumn	**Spring**	**Summer**
1	Unit 1: Place value within 1,000,000 (1) (8 lessons)	Unit 7: Multiplication and division (2) (10 lessons)	Unit 12: Geometry – properties of shapes (12 lessons)
2			
3	Unit 2: Place value within 1,000,000 (2) (6 lessons)	Unit 8: Fractions (3) (7 lessons)	Unit 13: Geometry – position and direction (6 lessons)
4			
5	Unit 3: Addition and subtraction (12 lessons)	Unit 9: Decimals and percentages (15 lessons)	Unit 14: Decimals (15 lessons)
6			
7	Unit 4: Multiplication and division (1) (10 lessons)		
8		Unit 10: Measure – perimeter and area (8 lessons)	Unit 15: Negative numbers (4 lessons)
9	Unit 5: Fractions (1) (8 lessons)		Unit 16: Measure – converting units (10 lessons)
10		Unit 11: Graphs and tables (6 lessons)	
11	Unit 6: Fractions (2) (11 lessons)		Unit 17: Measure – volume and capacity (3 lessons)
12			

Year 5 Objectives

Number – number and place value
read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit   - count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000   - interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero   - round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000   - solve number problems and practical problems that involve all of the above   - read Roman numerals to 1000 (M) and recognise years written in Roman numerals.
Number – addition and subtraction
add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)   - add and subtract numbers mentally with increasingly large numbers   - use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy   - solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
Number – multiplication and division
identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers   - know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers   - establish whether a number up to 100 is prime and recall prime numbers up to 19   **multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers**

- **multiply and divide numbers mentally drawing upon known facts**
- **divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context**
- **multiply and divide whole numbers and those involving decimals by 10, 100 and 1000**
- recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})
- solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
- solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple ratio.

Number Fractions (including decimals and percentages)

- **compare and order fractions whose denominators are all multiples of the same number**
- identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
- **recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$]**
- add and subtract fractions with the same denominator and denominators that are multiples of the same number
- multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
- read and write decimal numbers as fractions [for example, $0.71 = \frac{71}{100}$]
- recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
- round decimals with two decimal places to the nearest whole number and to one decimal place
- read, write, order and compare numbers with up to three decimal places
- solve problems involving number up to three decimal places
- **recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal**
- solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25.

Measurement

- **convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)**
- understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints
- measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres
- calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes
- estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water]
- solve problems involving converting between units of time

• use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.
Geometry – properties of shapes

• identify 3-D shapes, including cubes and other cuboids, from 2-D representations
 • know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
 • draw given angles, and measure them in degrees (°)
 • **identify:**
      o **angles at a point and one whole turn (total 360°)**
      o **angles at a point on a straight line and $\frac{1}{2}$a turn (total 180°)**
      o **other multiples of 90°**
 • use the properties of rectangles to deduce related facts and find missing lengths and angles
 • distinguish between regular and irregular polygons based on reasoning about equal sides and angles.

Geometry – position and direction
• identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.
Statistics
• **solve comparison, sum and difference problems using information presented in a line graph**   • complete, read and interpret information in tables, including timetables.

Year 5 Autumn Term

Number and place value   **Place value within 1,000,000 (1) – 8 lessons**   What to teach: • revisit Roman numerals to 100 and learn the numerals M (1,000) and D (500); explore reading and writing numbers using Roman numerals, and use the numerals M and D to recognise and represent years   • revisit numbers to 10,000 with a focus on place value and count in 1,000s from different numbers; build numbers and break them down using what is known about the value of each digit and knowledge of zero as a place holder   • work with numbers to 100,000, focusing on the position and value of each digit; represent numbers in different ways and break them down, explaining the value of each part   • develop understanding of place value up to the 100,000s, learning to read and write numbers accurately; count in steps of 100,000, 10,000, 1,000, 100, 10 and 1   • learn to write 5- and 6-digit numbers using both numerals and words; focus on the correct positioning of commas in numbers and understand that this helps to accurately write numbers in words   • focus on different powers of 10, such as 100 and 1,000, and consider how many other powers of 10 make up these numbers or any multiple of them (e.g. they should already know that there are 10 hundreds in 1,000, and they will use this to find how many hundreds there are in a 4-digit number)   • develop ability to count forwards and backwards in steps of 10, 100, 1,000 and 10,000   • use understanding of the place value of numbers with up to 6 digits to partition and recombine numbers to solve number problems   ***End of unit check - Place value within 100,000 (1)***

Number and place value
Place value within 1,000,000 (2) – 6 lessons
What to teach:
- estimate and accurately identify where numbers to 1,000,000 would lie on a number line; use understanding of place value to help achieve this
- compare and order numbers to 100,000 using what they know about place value and identify which digits they need to compare first each time, explaining what to do when the digits are the same; use the signs < and > to show comparisons and order
- use understanding of place value and numbers up to 1,000,000 to compare and order numbers
- learn how to round numbers to the nearest 100,000, through the real life context of the distance between the moon and earth and other planets; use number lines to help decide which 100,000 a number is closest to before rounding
- learn to round to the nearest 10,000 and identify the next and previous multiple, reasoning about which digit to check in a number to help make decisions on rounding
- use understanding of place value to help round numbers to the nearest 10, 100 and 1,000; discuss when rounding is appropriate and which multiple of 10 to round to in a given context.

End of unit check - Place value within 100,000 (2)

Number – addition and subtraction
Addition and subtraction – 12 lessons
What to teach:
- learn how to mentally add whole numbers by choosing the most efficient method from a variety of strategies
- learn how to mentally subtract whole numbers by choosing the most efficient method from a variety of strategies
- use the formal written method to add whole numbers with more than four digits, recognising the importance of place value
- identify large numbers in the context of distance and will use the formal written method to add two or more whole numbers with more than four digits.
- use the formal written method to subtract whole numbers with more than four digits, in the context of taking away and of finding a difference. This includes examples where an exchange is required
- explore how and why exchanges can occur in subtractions; use the formal written method to subtract whole numbers with more than four digits, including where exchanges are needed in some or all columns
- learn how to use rounding to help make estimates, identify sensible answers, find mistakes and check answers to calculations
- learn how to use the inverse operation in order to check the answers to addition and subtraction calculations
- learn what strategies to use to solve problems that involve adding and subtracting whole numbers with more than four digits
- learn how to solve more complex addition and subtraction multi-step problems that involve interpreting and identifying the information in order to solve the problem
- solve missing number problems involving addition and subtraction. A variety of contexts will be used and children should use the most appropriate and efficient strategies learned in the previous lessons
- solve problems involving comparison (children should see links between numbers to help them work out missing numbers rather than rely on formal written methods for calculating)

End of unit check – addition and subtraction

Number – multiplication and division

Multiplication and division (1) – 10 lessons

- learn the meaning of the mathematical term 'multiple'. They will spot patterns in multiples of numbers and use these to make generalisations and predictions
- build on their learning from the previous lesson on multiples as they begin to explore common multiples
- learn the meaning of the mathematical term 'factor' and use multiplication and division to find factors. They will spot patterns in factors of numbers and use these to make generalisations and predictions
- build on their learning on factors from the previous lesson to identify common factors
- earn about prime numbers and how they are different to other numbers. They will learn the correct vocabulary of prime and composite numbers and how to differentiate between them
- learn about square numbers and how to recognise and represent square numbers pictorially before linking this to using notation, including squared (2). Children will find square numbers in the multiplication grid and use them to solve calculations and problems.
- learn how to recognise and represent cube numbers pictorially before linking this to using notation, including cubed (3). They will learn how to find cube numbers and use them to solve calculations and problems
- use their understanding of place value to develop their ability to fluently multiply whole numbers by 10, 100 and 1,000
- use their understanding of place value to develop their ability to fluently divide whole numbers by 10, 100 and 1,000
- use their knowledge and understanding of multiplying and dividing by 10, 100 and 1,000 to reliably multiply numbers by multiples of 10, 100 and 1,000 using known multiplication facts

End of unit check – multiplication and division (1)

Number – fractions

Fractions (1) – 8 lessons

- develop their understanding of equivalent fractions. They will learn to find and represent fractions equivalent to a unit fraction using manipulatives, pictures and abstract representations.
- further develop their understanding of equivalent fractions. They will learn to find and represent equivalent fractions using manipulatives, pictures and abstract representations
- further develop their understanding of equivalent fractions. They use their learning developed in the previous two lessons to find families of equivalent fractions for a given fraction
- use their understanding of fractions to recognise mixed number fractions. They will independently convert improper fractions to mixed numbers
- use their understanding of fractions to recognise mixed numbers. They will independently convert mixed numbers to improper fractions
- learn to compare fractions based on their size. They will use pictorial representations to justify their comparisons and share their reasoning
- use their knowledge of comparing fractions to order them based on their size. They will use pictorial representations to justify their comparisons and share their reasoning
- learn to compare mixed numbers and order them based on their size. They will use pictorial representations to justify their comparisons and share their reasoning

End of unit check – fractions (1)

Number – fractions

Fractions (2) – 11 lessons

- recap their knowledge of adding and subtracting fractions by adding and subtracting fractions with the same denominator. They will use their knowledge of fractions equivalent to one whole to subtract from a whole amount
- use their knowledge from the previous lesson, along with their knowledge of equivalent fractions, to add fractions where one denominator is a multiple of the other, where the answer does not exceed one whole
- add fractions with a sum greater than 1. Children will convert mixed numbers and improper fractions and achieve answers in their simplest form.
- continue their learning on adding fractions as they add to a mixed number. They start by adding only wholes or only parts, before adding other mixed numbers where one denominator is a multiple of the other
- build on their understanding from the previous lesson to add pairs of mixed numbers. They partition the mixed numbers into parts and wholes to support their calculations and give their answers in the simplest form, where necessary
- build on their knowledge of adding fractions as they begin to subtract fractions within 1, where one denominator is a multiple of the other. They use their knowledge of equivalent fractions to find a common denominator and complete the subtractions.
- subtract a fraction from a mixed number where one denominator is a multiple of the other. The calculations do not cross the whole
- subtract fractions from mixed numbers where the subtraction crosses the whole. They will split wholes into parts to subtract like fractions
- subtract mixed numbers by subtracting the wholes and parts separately. The lesson also incorporates the concept of rewriting a mixed number in order to subtract the fractional part
- add and subtract mixed numbers in the context of word problems. They will practise solving problems by adding and subtracting wholes and parts
- solve multi-step addition and subtraction word problems using fractions and mixed numbers. They will interpret what is being asked based on a real-life context, write the problem as a number sentence and achieve an answer

End of unit check – fractions (2)

Autumn term assessment

Year 5 Spring Term

Number – multiplication and division

Multiplication and division (2) – 10 lessons

- reinforce prior knowledge of column multiplication and extend to understanding how to multiply numbers with up to 4 digits by a 1-digit number. Children will also be introduced to multiplying through partitioning of numbers.
- learn how to multiply pairs of 2-digit numbers by partitioning the numbers and using an area model
- build on prior knowledge of the column method of short multiplication and learn how to multiply pairs of 2-digit numbers using short multiplication
- build on prior knowledge of the grid method and column multiplication methods, and extend their learning to understand how to multiply a 3-digit number by a 2-digit number using these methods
- continue to develop use of the column method of long multiplication and extend their learning to understand how to multiply a 4-digit number by a 2-digit number

- learn to divide numbers with up to 4 digits by a 1-digit number using short division. All dividends have digits that are multiples of the divisor, so no remainders occur
- learn to divide numbers with up to 4 digits by a 1-digit number using short division. The dividends may not have digits that are multiples of the divisor, so some exchanges occur, but all answers are whole numbers
- learn to divide numbers with up to 4 digits by a 1-digit number using short division. Exchanges occur throughout the calculation and remainders occur in the answers.
- learn to interpret what the remainder will be when dividing by a 1-digit number, using knowledge of multiples. It will also consolidate learning of the short division method.
- further develop their knowledge of multiplication and division with remainders to solve problems with more than one step

End of unit check – multiplication and division (2)

Number – fractions
Fractions (3) – 7 lessons
- multiply a whole number and a unit fraction together. Children will convert between improper fractions and mixed numbers when answers are greater than 1
- multiply a whole number and a non-unit fraction together. Children will convert between improper fractions and mixed numbers to find answers in their simplest form
- multiply a whole number and a mixed number together using the method of converting the mixed number to an improper fraction before multiplying.
- multiply a whole number and a mixed number together using a method of multiplying the whole and parts separately
- find a non-unit fraction of an amount and find an amount given the value of a fraction of an amount
- calculate the whole when a fraction of an amount is given or when a part is given as a quantity.
- use fractions as operators and look at comparing different methods while deciding which is most efficient

End of unit check – fractions (3)

Number – fractions (including decimals and percentages)
Decimals and percentages – 15 lessons
- learn to read and write decimal numbers (up to two decimal places) using concrete equipment. They will explore the value of each digit and represent a range of numbers on a place value grid
- learn to read and write decimal numbers (up to two decimal places). This will include learning to read and write decimal numbers greater than 1.
- learn to read and write simple decimal numbers as fractions, such as tenths, quarters and halves.
- learn to read and write more complex decimal numbers as fractions, including numbers greater than 1.
- build on their learning from the previous two lessons to convert freely between fractions and decimals containing tenths, hundredths or both.
- introduced to thousandths for the first time as they represent them as fractions. They use their understanding from previous learning to recognise that, if the whole has been split into 1,000 equal parts, then each part is worth 1 thousandth.

- develop their understanding from the previous lesson on thousandths as fractions as they write thousandths as decimals. They learn that a thousandth can be written as 0·001, and that it is one-tenth of the size of a hundredth, or 0·01
- continue their learning on thousandths as they write numbers with 3 decimal places on a place value grid. They use their knowledge of place value, developed throughout the previous lessons, to identify the value of a given digit in a decimal number
- learn to compare decimals by using their knowledge of place value or converting them into fractions
- learn to order and compare decimal numbers with up to 3 decimal places using inequalities (< and >)
- round decimals to the nearest whole number and to one decimal place
- build on their learning from the previous lesson as they round to one decimal place, or to the nearest tenth. They identify which numbers with one decimal place lie either side of a given number, then use a number line to round to the nearest tenth.
- learn to understand percentages represented in a range of different diagrams. Children will understand that per cent means 'number of parts per 100'.
- learn to write percentages as a fraction with a denominator of 100, and as a decimal. It will be made explicit that percentages, decimals and fractions are all different ways of expressing proportions.
- convert between fractions, decimals and percentages. They will solve problems relating to equivalent fractions, decimals and percentages.

End of unit check – decimals and percentages

Measure
Perimeter – 8 lessons
- calculate the perimeter of rectangles in centimetres and metres. They will also use a shape's perimeter to derive its dimensions.
- find the perimeter of rectilinear shapes through measurement in centimetres.
- apply their knowledge of perimeter to solve problems, including calculating unknown lengths of composite rectilinear shapes
- find the perimeter of both regular and irregular polygons. They should know that a polygon is regular when all of its sides are equal in length and all of its angles are equal size. They should recognise that, to find the perimeter of regular polygons, they can multiply the length of one side by the number of sides
- explore the relationship between a rectangle's length and width, and its area. They will link the number of squares to related arrays and use multiplication to derive the area
- compare the area of rectangles (including squares). They will continue to apply their knowledge of multiplication to calculate areas
- build on their understanding of area developed in the previous lessons as they find the area of compound shapes that are made from rectangles
- apply their knowledge of area to estimate the area of irregular shapes.

End of unit check – perimeter

Statistics
Statistics – 6 lessons
- draw simple line graphs from data that is given in a table
- read line graphs with a range of scales and interpret the information to solve simple sum and difference problems.
- continue to develop their reading and interpretation of line graphs with more complex scales, including dual line graphs, to solve simple sum and difference problems

- extract information from tables to solve a range of problems involving four operations.
- create and extract information from two-way tables
- learn to use timetables, applying their knowledge of 24-hour times to read arrival and departure times and calculate duration

End of unit check – statistics

Spring term assessment

Year 5 Summer Term

Geometry – properties of shapes
Properties of shapes – 12 lessons
- learn to use degrees as a unit for measure of turn, focusing on common angles of 90°, 180°, 270° and 360° and linking with their understanding of whole turns, half turns and quarter turns. They will also encounter turns in multiples of 45°
- be introduced to the protractor and how to use it to measure acute angles
- continue to develop their protractor skills by measuring obtuse angles accurately
- continue to use a protractor to draw angles accurately. They combine this with drawing lines accurately to the nearest millimetre.
- learn to calculate missing angles around a point, by reasoning about the 360° in a whole turn
- begin to understand that they can calculate missing angles on a straight line, based on their knowledge of 180° as a half turn
- use reasoning about shapes to calculate missing angles and lengths. They use reasoning based on the properties of known lines, angles and shapes
- deepen their understanding of the concepts of regular and irregular polygons by considering them in terms of their knowledge of angles and lengths
- develop their understanding of parallel lines, including the use of arrow notation to distinguish sets of parallel lines. Children will recognise and draw parallel lines in different orientations
- build on their knowledge of angles to deepen their understanding of perpendicular lines, including recognising, labelling and drawing lines that are perpendicular to one another
- develop their reasoning about parallel and perpendicular lines in relation to one another in shapes and patterns. Children will use angle and length properties to support their judgements.
- learn to recognise the different views of 3D shapes or collections when viewed from different positions.

End of unit check – properties of shapes

Geometry – position and direction
Position and direction – 6 lessons
- use coordinates to accurately read and plot points in the first quadrant.
- solve problems where they find the missing vertices of 2D shapes drawn on a grid. They will give their answers using coordinates
- explore translations. They will learn how to translate simple 2D shapes on grid paper by moving one vertex at a time. Children will understand that the shape has not changed
- build on their knowledge of translation from the previous lesson. They will use coordinates to find translations.

- explore reflection. They will learn how to reflect simple 2D shapes in vertical and horizontal lines. Children will explore drawing reflections on different types of paper (squared, square dotted and isometric).
- find the coordinates of a reflected point on a grid. They will use coordinates to calculate new points rather than counting squares

End of unit check – position and direction

Number – fractions (including decimals and percentages)
Decimals - 15 lessons
- learn to add decimals, recognising the importance of place value.
- add and subtract decimals less than one. They will use the written column method to add or subtract decimals.
- work out how much needs to be added to another decimal to make the whole: to find the complement to 1
- add numbers less than 1 where the total is greater than 1
- add two numbers that have the same number of decimal places, such as 2·56 + 7·75
- use the column method to subtract decimals in the context of taking away or finding the difference. This will include examples where an exchange is required
- add and subtract decimals with a different number of decimal places. This includes examples where an exchange is required or where children must identify the mistake in a calculation
- add and subtract decimal numbers with up to 4 digits to and from whole numbers. They will perform exchanges when there are zeros in the columns
- learn strategies for solving problems involving adding and subtracting numbers with up to three decimal places.
- learn how to solve more complex addition and subtraction multi-step problems. They will interpret and identify the information necessary to solve the problems.
- use their understanding of decimal numbers to count and complete decimal sequences. They will describe the rule that decimal sequences follow and use it to calculate missing terms.
- use their understanding of place value to develop fluency in multiplying decimals by 10.
- use their understanding of place value to develop fluency in multiplying decimals by 10, 100 and 1,000
- recap how to divide integers and digits by 10
- use their understanding of place value and division of decimals by 10, to develop fluency in dividing decimal numbers by 10, 100 and 1,000.

End of unit check – decimals

Number and place value
Negative numbers – 4 lessons
- be introduced to negative numbers for the first time. They will count back through 0 on number lines using negative numbers
- look at negative numbers in context. They will count back through 0 on number lines using negative numbers.
- compare any two numbers, including negative numbers
- continue to learn about the position of positive and negative numbers on a number line and begin to find the difference between two numbers where one number is positive and the other is negative, or both are negative

End of unit check – negative numbers

Measure

Converting units – 10 lessons

- focus on metric units that begin with the prefix 'kilo'. They will apply their knowledge of place value to convert between kilograms and grams and vice versa
- focus on metric units that begin with the prefix 'milli'. They will apply their knowledge of place values to convert between millimetres and metres or centimetres, and between millilitres and litres
- convert between all combinations of mm, cm, m and km, including splitting conversions into more than one step (for example, mm → m → km). Children will identify the values they need to use for any conversion and apply these in multi-step problem-solving contexts.
- be introduced to imperial units of length. They will understand the terms inches, feet and yards, convert between these and use approximations to convert from imperial to metric units.
- be introduced to imperial units of mass. They will understand the terms ounces, pounds and stones, convert between them and use approximations to convert from imperial to metric units.
- be introduced to imperial units of capacity. They will understand the terms pints and gallons, convert between them and use approximations to convert from imperial to metric units.
- solve problems where they have to convert between units of time, including those where there is a remainder
- learn to use timetables, applying their knowledge of 24-hour times to read arrival and departure times and calculate durations
- apply their knowledge of metric units of length, mass and capacity to problems that require calculating with different units. They will work with measurements that have different numbers of decimal places and fractions of units
- apply their knowledge of converting units to solving problems. These will include a range of problem types, including those that involve applying multiplication and/or division facts to solve scaling problems.

End of unit check – converting units

Measure

Volume and capacity – 3 lessons

- be introduced to the concept of the volume of a 3D shape. They will measure this by counting the unit cubes used to make each shape.
- learn how to compare shapes according to their volumes.
- apply their knowledge of volume to estimate the volume of 3D shapes and consider how accurate their estimates are

End of unit check – volume and capacity

Summer term assessment

Year 6 overview

Week	Term		
	Autumn	**Spring**	**Summer**
1	Unit 1: Place value within 10,000,000 (8 lessons)	Unit 7: Ratio and proportion (9 lessons)	Unit 12: Statistics (11 lessons)
2			
3	Unit 2: Four operations (1) (8 lessons)	Unit 8: Algebra (11 lessons)	Unit 13: Geometry – properties of shape (12 lessons)
4			
5	Unit 3: Four operations (2) (12 lessons)	Unit 9: Decimals (9 lessons)	Unit 14: Position and direction (5 lessons)
6			Unit 15: Problem solving (14 lessons)
7		Unit 10: Percentages (8 lessons)	
8	Unit 4: Fractions (1) (9 lessons)		
9		Unit 11: Measure – perimeter, area and volume (11 lessons)	CONSOLIDATION AND SATS PREP
10	Unit 5: Fractions (2) (9 lessons)		
11			
12	Unit 6: Imperial and metric (5 lessons)		

Year 6 Objectives

Number – number and place value
read, write, order and compare numbers up to 10 000 000 and determine the value of each digit   - round any whole number to a required degree of accuracy   - use negative numbers in context, and calculate intervals across zero   **solve number and practical problems that involve all of the above.**
Number – addition, subtraction, multiplication and division
multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication   **divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context**   - divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context   **perform mental calculations, including with mixed operations and large numbers**   - use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy identify common factors, common multiples and prime numbers   **solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why**   - use their knowledge of the order of operations to carry out calculations involving the four operations   **solve problems involving addition, subtraction, multiplication and division**
Number Fractions (including decimals and percentages)

- use common factors to simplify fractions; use common multiples to express fractions in the same denomination
- **compare and order fractions, including fractions > 1**
- **add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions**
- multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} x \frac{1}{2} = \frac{1}{8}$
- divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$]
- **associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$]**
- recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.
- **identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places**
- multiply one-digit numbers with up to two decimal places by whole numbers
- use written division methods in cases where the answer has up to two decimal places
- **solve problems which require answers to be rounded to specified degrees of accuracy**

Ratio and proportion

- **solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison**
- solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts
- solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.
- solve problems involving similar shapes where the scale factor is known or can be found

Algebra

- **use simple formulae**
- **generate and describe linear number sequences**
- express missing number problems algebraically
- find pairs of numbers that satisfy an equation with two unknowns
- enumerate possibilities of combinations of two variables.

Measurement

- **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 up to three decimal places**
- convert between miles and kilometres
- **solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate**
- recognise when it is possible to use formulae for area and volume of shapes
- calculate the area of parallelograms and triangles
- recognise that shapes with the same areas can have different perimeters and vice versa
- calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3].

Geometry – properties of shapes

- **compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons**
- draw 2-D shapes using given dimensions and angles

- illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
- **recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.**
- recognise, describe and build simple 3-D shapes, including making nets

Geometry – position and direction

- **describe positions on the full coordinate grid (all four quadrants)**
- draw and translate simple shapes on the coordinate plane and jhreflect them in the axes.

Statistics

- interpret and construct pie charts and line graphs and use these to solve problems
- calculate and interpret the mean as an average.

Year 6 Autumn Term

Number and place value
Place value within 10,000,000 – 8 lessons
What to teach:
- learn about the place value in numbers to 1,000,000; learn to read and write these numbers fluently and identify their place value.
- learn about the place value of numbers to 10,000,000; learn to read and write these numbers fluently and identify their place value.
- use understanding of place value and numbers up to 10,000,000 to partition numbers and solve problems in real-life contexts
- deepen understanding of the key place value units: 10s, 100s, and 1,000s
- accurately identify and estimate where numbers up to 10,000,000 lie on a number line; use understanding of place value to help achieve this
- use understanding of place value and numbers up to 10,000,000 to compare and order numbers
- use understanding of place value to help round numbers up to 10,000,000; discuss when rounding is appropriate and which power of 10 to round to in a given context
- learn about negative numbers and their relationship with positive numbers; use negative numbers in context and use a number line to identify negative numbers and begin calculating with them

End of unit check - Place value within 10,000,000

Number – addition, subtraction, multiplication and division
Four operations (1) – 8 lessons
What to teach:
- rehearse and refine efficient written methods for the addition of whole numbers
- rehearse and refine use of the column method of subtraction for whole numbers
- develop their understanding of the columnar written methods of addition and subtraction where exchanges are sometimes necessary
- develop understanding of factors and how common factors link two or more numbers; use this understanding to find common factors
- develop understanding of multiples and how common multiples link two or more numbers; use this understanding to find common multiples
- recognise the properties of numbers that can be used to deduce their divisibility by 2, 3, 5 and other factors
- learn to recognise and identify prime numbers; explore how these numbers are different from other numbers

- learn to recognise and identify square and cube numbers; explore how these numbers are different from others

End of unit check – four operations (1)

Number – addition, subtraction, multiplication and division
Four operations (2) – 12 lessons
What to teach:
- develop understanding of the multiplication of 4-digit numbers by 1-digit numbers; use multiple representations and methods to solve these calculations
- develop understanding of the multiplication of numbers with up to four digits by 2-digit numbers; use multiple representations and methods to solve these calculations
- learn to use a written short division method
- use factors of the divisor in order to divide efficiently
- learn to recognise and identify square and cube numbers; explore how these numbers are different from others
- use long division to divide by 2-digit numbers
- develop understanding of division with remainders; learn how the written methods for division they have learnt can represent and solve a division calculation that has a remainder. They will also learn that representing a remainder as a fraction can give a more accurate answer
- learn the correct order of operations and use this to help solve multi-step calculations
- extend understanding of the order of operations by investigating what effect brackets can have on a calculation
- learn efficient mental methods for solving calculations with smaller numbers, including decimals
- learn efficient mental methods for solving calculations with larger numbers, up to 1,000,000s
- draw upon learning throughout the unit to read, understand and solve mathematical puzzles and problems; use number facts they know to help solve more complicated problems

End of unit check – four operations (2)

Number – fractions
Fractions (1) – 9 lessons
- apply their knowledge of factors to use common factors to simplify fractions. They will also extend their understanding of simplifying fractions to simplify mixed numbers and improper fractions.
- use their understanding of fractions to count up and down on a number line, place missing fractions on a number line and find missing numbers in a fractional sequence
- use their understanding of fractions to develop their ability to compare and order fractions by making the denominators the same and comparing the numerators
- revisit how to add and subtract fractions with the same denominator, or with easily related denominators. This is a chance to revisit some common misconceptions
- link their prior knowledge of finding equivalent fractions with common denominators to adding and subtracting fractions where the answer is between 0 and 1.
- extend their knowledge of adding mixed numbers and fractions by using two methods to add mixed fractions where the fractional answer is greater than 1.
- extend their understanding of subtracting mixed numbers and fractions to calculations where the fractional answer crosses the whole and they cannot simply subtract the wholes and subtract the parts

- extend their knowledge of adding and subtracting mixed numbers to solve problems which involve adding and subtracting more than two mixed numbers.
- understand how to solve more complex problems that involve adding and subtracting mixed numbers and fractions and which have more than one step

End of unit check – fractions (1)

Number – fractions
Fractions (2) – 9 lessons
- build on their learning from Year 5 to multiply proper and improper fractions and mixed numbers by a whole number.
- learn to multiply a fraction by a fraction. They will use visual aids such as divided squares to support their understanding
- learn to multiply a fraction by a fraction by multiplying the numerators and multiplying the denominators
- learn how to divide a non-unit fraction by a whole number when the numerator is a multiple of the whole number. They will build on their work using diagrams in the previous lesson. They will start to identify the pattern between numerators and the number they are dividing by
- learn to divide unit fractions by a whole number. They will practise recording the original fractions in a diagram and then dividing one of the sections. They will be exposed to a pattern between denominators and the number they are dividing by.
- build on the previous two lessons and learn to divide any fraction by a whole number. They will continue to use both diagrams and abstract methods to solve calculations and show their working out.
- solve fraction problems involving addition, subtraction, multiplication and division. They will use the order of operations and visual aids such as bar models to support their understanding
- learn to find fractions of amounts in various contexts. They will use visual aids such as bar models to solve problems and support their understanding
- solve problems involving finding fractions of amounts, including problems where children have to find the whole given information about a part.

End of unit check – fractions (2)

Measurement
Imperial and metric – 5 lessons
- read, write and recognise all metric measures for length, mass and capacity. They will apply their understanding to make sensible estimations
- convert between metric units of measurement, including measurements that involve decimals.
- solve a range of problems using all four operations in the context of metric measures.
- learn the 5 : 8 ratio between miles and kilometres. They will apply it to convert between these imperial and metric units of measurement
- consolidate their knowledge of imperial measures, converting between two imperial units and between an imperial and metric unit of measurement.

End of unit check – imperial and metric
Autumn term assessment

Ratio and proportion

Ratio and proportion – 9 lessons

- be introduced to the concept of ratio and proportion and will use the language of ratio to describe and compare the different parts within a whole.
- compare ratios, explore different representations of ratio and identify ratios from given amounts or diagrams
- use ratios to calculate totals and amounts and will consider the different methods that can be used.
- interpret scales on maps and plans. They will measure lines on the map or plan and calculate the length in real life.
- When provided with measurements, find the scale factor. They will then apply the scale factor to calculate further measurements.
- learn that for two shapes to be similar they must have the same proportions. They will identify if shapes are similar, deduce scale factors and draw similar shapes
- use ratios to deduce quantities.
- solve problems involving proportion where the scale is not a whole number. They will use their knowledge of fractions and multiples and will compare and discuss different methods to solve the same question
- solve a range of problems involving ratio, including 2-step problems.

End of unit check – ratio and proportion

Algebra

Algebra – 11 lessons

- investigate number sequences and identify the algebraic rule that governs them. They will learn how to write these rules in a form that allows them to be applied generally
- find a rule for a number sequence that has more than one step. They will represent these sequences in a concrete, pictorial and abstract manner, focusing particularly on the algebraic expressions.
- apply their understanding of algebraic rules and investigate how they can be used to solve and generalise a contextual problem
- use their understanding of using algebraic rules to find the nth term in an algebraic sequence
- create algebraic expressions that generalise the rule in a number sequence. They will use these expressions to find the nth term in a sequence.
- find and record algebraic formulae. They will link these formulae to different real-life contexts and use them to spot patterns
- read, understand and solve algebraic equations. They will represent equations in different ways and use these representations to support their reasoning
- continue to develop their ability to solve equations, extending their understanding of using the inverse calculation to find the missing number in an equation.
- develop their ability to create algebraic equations based on contextual word problems. They will use this to find missing numbers in 2-step equations.
- use their understanding of creating algebraic equations to create equations they can use to find all solutions to a given problem with two missing values
- continue to develop their ability to find all possible solutions to a given problem, this time including more than one variable, representing their solutions with algebraic equations

End of unit check – algebra

Number – fractions (including decimals and percentages)
Decimals – 9 lessons
- rehearse the place value of numbers, including decimals with tenths, hundredths and thousandths.
- round decimals to the nearest whole number and then to the nearest tenth or hundredth.
- revise and rehearse written methods for the addition and subtraction of decimals
- learn to multiply decimals by powers of 10. They will apply their knowledge from previous learning of multiplying whole numbers by 10 and 100.
- divide by powers of 10. They will develop understanding of digits moving to the right when dividing by 10, 100 and 1,000.
- multiply a decimal by a whole number where the product requires crossing into the next place up.
- divide decimals by using known multiplication facts and adjusting by powers of 10. They will understand how to exchange 1s to tenths in order to solve the division by sharing.
- learn to convert fractions to decimals and decimals to fractions where the denominator is a power of 10, using equivalent fractions and simplification
- calculate the decimal equivalents of fractions by dividing the numerator by the denominator

End of unit check – decimals

Number – fractions (including decimals and percentages)
Percentages – 8 lessons
- work with fractions that are shown as 'out of 100' and will express these as percentages. They will use the % sign to represent per cent.
- apply their understanding of equivalent fractions and parts out of 100 to convert fractions to percentages.
- find equivalent fractions, decimals and percentages, and convert between them.
- order and compare decimals, percentages and fractions, including those that are greater than 1.
- learn two methods of finding 20%. They understand that 20% = 20/100 = 2/10 = 1/5 , so they can find 1 5 . They will also learn that 20% is a compound of 10% and 10% and will use this to find other simple percentages of amounts.
- find 1% and then use this to work out multiples of 1%
- find 75% by working out 50% and 25% and then adding them together. They will explore other compounds as well, such as 15% and 99%.
- find missing values in problems involving percentages.

End of unit check – percentages

Measurement
Perimeter, area and volume – 11 lessons
- find the areas of shapes by counting individual squares. They will draw different shapes with the same area.
- explore simple shapes that have the same area but different perimeters. They will explore this in shapes other than rectangles.
- explore how shapes with the same perimeter can have different areas. They will apply their knowledge of perimeter to find missing lengths and will calculate the area of squares, rectangles and rectilinear shapes
- apply their knowledge of area to estimate and find the area of triangles by counting squares

- find the area of right-angled triangles. They will understand that the area of a triangle is half the area of a rectangle with the same height and width
- apply their knowledge of area to calculate the area of any triangle.
- learn how a parallelogram can be rearranged into a rectangle to derive the formula for calculating the shape's area.
- apply their knowledge of area to solve problems, in particular when calculating the area of a composite shape or when finding missing measurements for a given area.
- apply their knowledge of perimeter to solve problems, in particular when calculating unknown lengths and perimeters of composite rectilinear shapes.
- calculate the volume of cuboids and explore different shapes with the same volume
- calculate the volume of shapes, using the formula V = l × w × h, and find missing dimensions when the volume is given

End of unit check – perimeter, area and volume

Spring term assessment

Statistics
Statistics – 11 lessons
- learn to read and understand line graphs. They learn to read amounts and times on the line graph and use this to solve problems
- learn to create and plot more complex line graphs, building on skills from Year 5. They choose and draw an appropriate scale.
- deepen their skills with interpreting bar charts by exploring more advanced examples.
- Be introduced to pie charts. They compare pie charts to tally charts and bar charts. Children should begin to understand that pie charts show results as a whole split into parts.
- begin to read and interpret pie charts. Children can answer questions about pie charts.
- calculate the fractions represented in pie charts. They compare the categories by converting them into fractions of the pie chart.
- use given fractions of a pie chart, along with the total number of items the chart represents, to calculate the number of items in each category
- learn that the whole pie chart is represented by 100%. They compare and convert percentages of the pie chart to fractions. Children use percentages to calculate the value of each category
- use the mathematical term 'mean' when referring to the average. They also consider two methods for calculating the mean of a set of number
- practise calculating the mean. Children explore using bar models as a visual representation. They consider situations when the mean is useful to compare groups of data
- solve problems involving the mean of a group of data. They learn to use the mean to calculate missing parts of data. Children secure their knowledge and understanding of finding the mean of a group of data

End of unit check – statistics

Geometry
Properties of shape – 12 lessons
- reinforce prior knowledge of angle types and understand how to measure angles using a protractor

- extend their understanding of angles to discover that vertically opposite angles are equal.
- apply their knowledge of accurately drawing shapes and measuring angles to understand that angles in a triangle total 180°
- extend their understanding of angles in a triangle and will apply their knowledge to calculate missing angles without using a protractor
- understand how to calculate missing angles in an isosceles triangle given one of the other angles. Children will also solve problems that incorporate this
- reinforce prior knowledge of the properties of shapes and extend their learning to understand the interior angles of a quadrilateral sum to 360°
- develop their understanding of the sum of the angles in quadrilaterals and extend this to calculate the sum of the interior angles in other polygons, then use these to find missing angles.
- understand that as the number of vertices increases an equal distance from the centre, a circle is formed. They will learn the definition of radius and diameter and can solve problems involving radius and diameter
- learn more about the parts of a circle and their properties
- understand how to draw shapes accurately using a ruler and a protractor. Children also explore drawing shapes on dotted paper.
- use their understanding of the properties of 3D shapes to develop their ability to identify shapes from nets and draw nets
- build on their knowledge of nets of 3D shapes by exploring the multiple nets of a cube in the context of dice.

End of unit check – properties of shapes

Geometry
Position and direction – 5 lessons
- revisit how to plot coordinates in the first quadrant. They will solve problems that involve reasoning using the properties of shape, and their coordinate knowledge.
- Be introduced to plotting coordinates in all four quadrants.
- Be introduced to translating shapes on a coordinate grid.
- Be introduced to reflecting shapes on a coordinate grid.
- extend their ability to reason about shapes based on their properties and to solve problems that involve coordinates in all four quadrants

End of unit check – position and direction

Number - addition, subtraction, multiplication and division
Problem solving – 14 lessons
- use their understanding of place value to solve problems involving rounding, estimating and the positional values of digits
- use what they have learnt about positive and negative numbers to help solve problems with and without a context. They will build on the previous lesson as they identify the intervals on different scales.
- flexibly apply their understanding of addition and subtraction to a range of problems. They will have the opportunity to consider different strategies dependent on the numbers and operations. They will use estimation to check answers.
- use the four operations to solve a range of problems. They will make decisions about which operation to use first, and recognise when and why a calculation can be carried out in a different order

- use the four operations to solve a range of non-routine problems involving missing numbers and unknown values, and also problems set in the context of measurements. They will reason about the given information and decide the best starting point.
- apply their understanding of fractions to help them identify, compare and calculate. They will draw on their knowledge of equivalent fractions to help solve problems and use reasoning skills to make decisions.
- work with decimals to solve problems with and without a context. They will use representations to help make sense of problems and decide which operations to use.
- work with percentages to solve a range of problems. They will use what they know about percentage and fraction equivalence to make decisions about calculating and to help them recognise representations.
- further explore ratio as a relationship between parts to help solve problems in different contexts. They will use representations to show a ratio and make use of multiplication facts to help scale quantities.
- calculate time intervals and convert between units of time to solve problems. They will interpret and make use of number lines as time lines.
- solve more complex problems about time involving two or more steps. They will convert between units of time to calculate and compare. They will also draw on their understanding of timetables, the number line, measurement and statistics.
- solve problems using coordinates in all four quadrants. They will apply their knowledge of the properties of shapes to reason about the coordinates of an unlabelled or unknown vertex, including following a translation or reflection. They will also find half-way points, using the structure of the grid.
- solve problems using the angle sum of triangles and quadrilaterals, angles on a straight line or at a point, and vertically opposite angles. They will use standard mathematical notation and will reason about the sizes of missing angles
- continue to reason about the sum of interior angles in triangles and quadrilaterals, and angles on a straight line and at a point. They will revisit calculating the sum of the interior angles in regular polygons to identify the size of each angle. They will continue to apply their understanding to find missing angles.

End of unit check – problem solving