Bedwas Junior School

Mathematics and Numeracy Policy

(To be read in conjunction with the following school policies: Inclusion Policy, Behaviour Policy, Equal Opportunities Policy, Racial Equality Policy and Attendance Policy)

Mathematics teaches us how to makes sense of the world around us through developing a child's ability to calculate, to reason and to solve problems. It enables children to understand and appreciate relationships and pattern in both number and space in their everyday lives. Through their growing knowledge and understanding, children learn to appreciate the contribution made by many cultures to the development and application of mathematics.

Aims and Objectives

The aims of mathematics in Bedwas Junior School are to:

- develop a fascination and enjoyment of maths as a subject in which all children can achieve and be successful;
- promote opportunities for learning through practical activity, exploration and discussion;
- promote confidence and competence with numbers and the number system;
- develop the ability to solve problems through decision-making and reasoning in a range of contexts;
- develop a practical understanding of the ways in which information is gathered and presented;
- explore features of shape and space, and develop measuring skills in a range of contexts;
- develop the ability to use specific mathematical vocabulary to communicate ideas;
- develop the ability to recall number facts quickly and accurately and use appropriate mental calculation strategies;
- understand the importance of mathematics in everyday life.

Statutory Requirements

Statutory requirements for the teaching and learning of English and Literacy are laid out in the *'Mathematics in the National Curriculum'* (Welsh Government, 2010), the *'National Literacy and Numeracy Framework'* (Welsh Government, 2013) and the *'Successful Futures: An Independent Review of Curriculum and Assessment Arrangements in Wales'* (Welsh Government, 2015) documents. Legislation and guidance on approaches to delivering Mathematics and Numeracy is currently undergoing a period of transition. The school aims to reflect these changes as they occur.

Full details of the coverage of skills and range can be found in the WG document **'Mathematics in the National Curriculum for Wales'** and this should be referred to when planning lessons. A link is provided here:
http://learning.wales.gov.uk/resources/browse-all/mathsnc/?lang=en

The Implementation of the Mathematics Scheme of Work and the Numeracy Framework

Mathematics is a core subject in the National Curriculum, and we currently use The National Numeracy Strategy Framework resources and national curriculum level indicators as the basis for implementing the statutory requirements of the programme of study for mathematics. Weekly team planning ensures that work is differentiated to ensure there is appropriate challenge for all pupils. Targets identified in 'Pupil Progress Meetings' and 'Individual Educational Plans' are also incorporated into weekly planning where relevant. Objectives linked to our school based 'skills ladder' ensure continuity and progression across the school.

Mathematics must be child–centred and skills-focused. Therefore we ensure that we provide opportunities for pupils to develop the 'skills' through the breadth of contexts that are identified under mathematics.
The contexts are as follows:

- Using and Applying Mathematics
- Number
- Shape, Space and Measures
- Handling Data

We need to recognise the need to develop strategies that allow all children to learn in ways that best suit them. More detail on our school policy of strategies adopted across the curriculum can be found in the Bedwas Junior School Teaching and Learning Policy.

Curriculum planning in Mathematics is carried out in three phrases (long-term, medium-term and short-term). The National Numeracy Strategy Framework for Teaching gives a detailed outline of what we teach in the long term, while our yearly teaching programme identifies the key objectives in mathematics that we teach each year. Although the National Numeracy Strategy is currently being used as our main basis for planning, teachers should still utilise other resources and schemes where appropriate, in order to provide suitable learning opportunities and consolidation.

Medium Term Planning

Our medium-term mathematics plans, which are adopted from the Framework and give details of the main teaching objectives for each term, define what we teach. They ensure an appropriate balance and distribution of work across each term, with revisiting of key concepts. Please refer to Appendix 1 for further information.

Weekly Planning

Weekly planning takes place in phase groups – Upper School (Years 5&6) and Lower School (Years 3&4). The NNS strategy plans are used and adapted to suit the needs of the children.

These weekly plans list the specific objectives for each lesson and give details of how the lessons are to be taught. Class teachers should then further differentiate the lessons appropriately for their class to ensure appropriate challenge and support.
Each lesson should follow a similar structure to that indicated below:

- **Mental warm up** - A quick 5-10 minute interactive activity based on number skills e.g.: chanting tables, quick fire questions, recalling number bonds.
- **Main teaching and activities** - Introducing a new concept or consolidating a previously taught concept.
- **Plenary** - focus on a word problem or reasoning problem linked to the skill from the lesson. This style of plenary will ensure that we are enabling pupils to contextualise their learning and apply their skills to real life situations.

Upper School Classes

In Upper School pupils are placed into 3 differentiated learning classes. This enables teachers to tailor support and challenge to the needs of the pupils. Year 6 pupils are always placed in either the top or middle class, in order to provide them with the appropriate challenge needed to reach end of Key Stage 2 targets.

Lower School Classes

In Lower School, the pupils in the year 3 class follow the year 3 NNS units, whereas the pupil in the year 3/4 class and year 4 class follow the year 4 NNS units to provide challenge to the children. However, if the year 3/4 class need further reinforcement of topics, the class teacher may decide to follow the year 3 lessons.

Lesson Evaluations

Weekly lesson plans should be evaluated on a daily basis in order to ensure that subsequent lessons are adapted to suit the requirements of the pupils. Evaluations should be discussed in weekly phase group planning meetings in order to ensure the evaluations inform future planning.

Progression of Skills in Mathematics and Numeracy

In mathematics it is always important that learning is contextualised for the pupils. This ensures that they see the links between the skills that they are learning and the use of maths in everyday life. Therefore opportunities should be exploited for pupils to apply their numeracy skills in the context of subjects other than mathematics and in real life contexts. In maths lessons teachers should look for opportunities to explicitly contextualise learning and apply the use of number. The school has created a comprehensive and systematic criteria for expectations by end of each curriculum year. These are evidenced in detail in the school's subject specific 'Skills Ladder' and 'National Literacy and Numeracy Mapping document'.

ICT and other technologies

The school recognises the important role ICT has to play in our school in the development of Mathematical skills. ICT is used on a daily basis to enhance the teaching of mathematics through the use of effective apps on the iPads and laptops.

Mathematics Interventions

The school uses RM maths as a tool for consolidation and support in teaching maths.
In upper school, year 6 pupils who are identified as being more than 2 sub levels below their nationally expected level will participate in early morning RM maths sessions every day.
Teachers are able to access records for pupils in order to see progress and identify gaps in learning.

Homework

Daily mental maths homework is set to pupils in years 4-6 which focus on times tables, number bonds, doubling and halving. Year 3 pupils are given a set times table to learn. Online 'MyMaths' homework is set on a weekly basis. The homework topic chosen by the class teacher should link into concepts covered in class and should be differentiated appropriately for the needs of the pupils. In addition to weekly 'MyMaths' homework, online maths activities should also be used with links made accessible from the class hwb. For those children who do not have access to a computer, the school is open before and after school every day for the homework to be completed.

Assessment, Recording and Reporting

As detailed in the Assessment, Marking and Feedback policy, maths work should be marked on a daily basis. When teaching an adapted unit from the National Numeracy Framework, daily work should be marked and commented on with a brief comment. At the end of a unit the class teacher will complete an assessment grid to identify the pupils understanding of each learning objective. Children will also self-assess their learning and knowledge of the topic by using a traffic light system or a written evaluation.

Teachers assess children's progress on a termly progress and record on specific assessment tracking sheets. The tracking sheets are colour coded which allow the class teacher to monitor the progress made since the previous summer and how each child is performing in line with the national expectation. The progress of individual pupils is discussed termly with parents at Parents' Evenings. Parents are informed of their child's progress from the previous term, as well as against National targets. End of year National curriculum levels are reported to the parents in their child's End of Year Report. The results of the annual National Tests are also recorded on a spreadsheet, which allows teachers to track the progress made by pupils on an annual basis.

Equalities

Bedwas Junior School has universal ambitions for every child, whatever their background or circumstances. Children learn and thrive when they feel safe in their environment, are healthy and have an appetite to learn.

The cultural diversity, home languages, gender and religious beliefs of our school community are all celebrated. Our curriculum includes a wide range of texts and other resources which celebrates 'Welshness' and also represents the diversity and backgrounds of all other children across the school.

Role of the Subject Leader

The Subject Leader is responsible for improving the standards of teaching and learning in Mathematics through:

- monitoring and evaluating:-
  - pupil progress
  - provision of Mathematics/Numeracy
  - quality of teaching of Mathematics/ Numeracy
  - the quality of the Learning Environment;
- taking the lead in policy development;
- auditing and supporting colleagues in their CPD;
- purchasing and organising resources;
- keeping up to date with recent Numeracy developments.

Parental Engagement

The school aims to involve parents directly in the life of the school, and thus in the development of children's skills, knowledge and understanding in Mathematics and Numeracy. There are opportunities each term when parents can discuss their children's progress with their teacher. This includes sharing current teacher assessment sub-levels.
Termly curriculum letters also provide information about the Mathematics and Numeracy curriculum and how parents can support their children. The Homework Policy also emphasises the importance of completing weekly 'MyMaths' homework. Strategies for supporting children are shared through 'Family Learning' training sessions.

Staff Development

Teachers keep up to date with subject knowledge and use current materials that are available in school, from the LA and from courses they attend. Training needs are identified as a result of whole school monitoring and evaluation, performance management and through induction programmes. These are reflected in the School Self-Review and School Development Plan which always includes targets linked to literacy.

Additional adults who are involved with intervention programmes will receive appropriate training that may be school based or part of LA central training.

Policy Written by
Vicky Bodenham (Mathematics/Numeracy Coordinator)
May 2015

Date for review: May 2019

Signed by Chair of Governors Nicholas Jones

Appendix 1

Medium term plan: Autumn term **Year 3**

EVERY DAY: Practise and develop oral and mental skills (e.g. counting, mental strategies, rapid recall of + , − , x and ÷ facts)	
Read and write whole numbers up to 1000 Add/subtract 1, 10, 100 to any whole number Count on/back in 10s, 100s from any two- and three-digit number Recall addition and subtraction facts for each number up to at least 10 Recall pairs that make 20	Derive doubles of whole numbers to 15, corresponding halves. Know multiplication facts in x5 table and derive division facts Recall multiplication facts up to 5x5Recall multiplication facts in x10 table and derive division facts. Recall multiplication facts in x2 table and derive division facts.

Unit	Days	Topic	Objectives: children will be taught to
1	3	Place value, ordering, estimating, rounding Reading numbers from scales	• Read and write whole numbers to 1000 in figures and words; • Know what each digit represents and partition three-digit numbers into a multiple of 100, a multiple of 10, and ones; • Read and begin to write the vocabulary of estimation; • Estimate up to 100 objects; • Read scales to the nearest division.
2–3	10	Understanding + and – Mental calculation strategies (+ –) Money and 'real life' problems Making decisions, checking results	• Extend understanding of the operations of addition and subtraction. Read and begin to write related vocabulary. Use +, - and = signs; • Recognise that addition can be done in any order; • Put larger number first in order to count on. Identify near doubles; • Bridge through a multiple of 10 and adjust; • Recognise all coins and notes. Understand £/p notation (e.g. £3.06); • Find totals, give change and work out how to pay; • Choose appropriate number operations and calculation methods to solve word problems. Explain and record methods informally; • Check sums by adding in different order.
4–6	13	Measures, including problems Shape and space Reasoning about shapes	• Read time to 5 minutes; • Use ruler and draw and measure lines to nearest half cm; • Read and begin to write the vocabulary related to length; • Choose an appropriate number operation and calculation method to solve word problems. Explain and record method informally; • Measure and compare using m, cm. Know relationship m, cm; km,m; • Use decimal notation for m and cm. Suggest suitable units and equipment to estimate or measure lengths, including km; • Read scales; • Record to nearest whole/half unit, or as mixed units (e.g. 3m 20cm); • Classify and describe 3-D and 2-D shapes, referring to reflective symmetry, facts, sides/edges, vertices, angles; • Read and begin to write the vocabulary of position. Use spaces on square grids. Identify right angles in 2-D shapes and in the environment; • Investigate general statements about shapes.

Read and write whole numbers up to 1000 Say the number that is 10, 100 more/less than any two- or three-digit number Count on/back in 10s, 100s from any two-/three-digit number State subtraction fact corresponding to addition fact and vice versa. Recall addition and subtraction facts for each number up to 20	Derive doubles of whole numbers to 20, corresponding halves Derive near doubles Recall pairs of multiples of 100 that make 1000Recognise odd/even numbers to 11 Recall multiplication facts in x2, x5 and x10 tables and derive division facts. Recall multiplication facts up to 5 x 5.

8	5	Counting, properties of numbers and number sequences Reasoning about numbers	• Count larger collections by grouping them in tens, then other numbers; • Count on/back in 10s/100s, starting from any two-/three-digit number; • Count on or back in twos, starting from any two-digit number and recognise odd and even numbers to at least 100; • Solve number puzzles; • Explain methods and reasoning orally and in writing.
9–10	10	Understanding x and ÷ Mental calculation strategies (x ÷) Money and 'real life' problems Making decisions, checking results	• Understand multiplication as repeated addition and as an array; • Read and begin to write related vocabulary; • Recognise that multiplication can be done in any order; • To multiply by 10/100, shift the digits one/two places to the left; • Choose an appropriate number operation and calculation method to solve word problems involving money and 'real life'; • Explain and record method informally; • Check multiplication in a different order.
11	5	Fractions	• Recognise unit fractions $\frac{1}{2}$, 1/3, $\frac{1}{4}$, 1/5, and 1/10 and use them to find fractions of shapes and numbers; • Begin to recognise fractions that are several parts of whole 2/3, $\frac{3}{4}$, 3/10.
12	5	Understanding + and – Mental calculation strategies (+ –) Time, including problems Making decisions, checking results	• Understand that subtraction is the inverse of addition; • Say a subtraction statement equivalent to an addition statement and vice versa; • Find a small difference by counting up from the smaller number; • Read and begin to write the vocabulary related to time; • Use units of time and relationship between them; • Choose appropriate number operations and calculation methods to solve word problems. Explain and record method. Check subtraction with addition.
13	5	Handling data	• Solve a given problem by organising and interpreting data in frequency tables and in pictograms with the symbol representing two units.

Medium term plan: Spring term **Year 3**

EVERY DAY: Practise and develop oral and mental skills (e.g. counting, mental strategies, rapid recall of + , – , x and ÷ facts)	
Read and write whole numbers up to 1000Count on/back in 10s, 100s from any two-/three-digit number State subtraction fact corresponding to addition fact and vice versa Recall addition and subtraction facts for each number up to 20 Recall pairs of multiples of 100 with a total of 1000	Order a set of three-digit numbers. Derive doubles of whole numbers to 20, corresponding halves Derive near doubles Count on or back in twos. Recognise odd/even numbers to 100 Recall multiplication facts in x2, x5 and x10 tables and derive division facts

Unit	Days	Topic	Objectives: children will be taught to
1	3	Place value, ordering, estimating, rounding Reading numbers from scales	• Read and write the vocabulary of comparing and ordering numbers, including ordinal numbers to 100; • Compare two three-digit numbers and say which is more less; • Read and begin to write the vocabulary of approximation; • Round any two-digit number to nearest 10; • Read scales and dials.
2–3	10	Understanding + and –Mental calculation strategies (+ –) Money and 'real life' problems Making decisions, checking results	• Add three then four single-digit numbers mentally; • Add three or four small numbers by putting the largest number first and/or finding pairs that total 10; • Partition into 5 and a bit to add 6, 7 or 8; • Choose appropriate number operations and calculation methods to solve money and 'real life' word problems with one or more steps; • Explain and record method; • Check with an equivalent calculation.
4–6	15	Shape and space Reasoning about shapes Measures, and time, including problems	• Make and describe shapes and patterns; • Relate solid shapes to pictures of them; • Read and begin to write the vocabulary of direction; • Make and use right-angled turns and use the four compass points; • Solve shape problems or puzzles. Explain reasoning and methods; • Read time to 5 minutes on analogue and 12-hour digital clocks (e.g. 9:40); • Read and being to write the vocabulary related to mass; • Measure and compare using kilograms and grams and know the relationship between them. Suggest suitable units and equipment to estimate or measure mass; • Read scales; • Record measurements using mixed units, or to the nearest whole/half unit (e.g. 3.5kg); • Choose appropriate number operations and calculation methods to solve measurement word problems with one or more steps; • Explain and record method.

Read and write whole numbers up to 1000 Count on or back in 10s, 100s from any two-/three-digit number State subtraction fact corresponding to addition fact and vice versa Derive doubles of whole numbers to20, corresponding halves Derive doubles of multiples of 5 to 50 Recall addition and subtraction facts for each number up to 20.	Recall pairs of multiples of 100 with a total of 1000Recall pairs of multiples of 5 with a total of 100 Recall multiplication facts in x2, x5, x10 tables and derive division facts. Recall multiplication facts in x3 table Order a set of three-digit numbers

8	5	Counting, properties of numbers and number sequences Reasoning about numbers	• Count on in steps of 3 or 4 or 5 from any small number to at least 50 and back again; • Create and describe simple number sequences; • Investigate general statements about familiar numbers and give examples that match them; • Solve number puzzles; • Explain methods and reasoning orally and in writing.
9–10	10	Understanding + and – Mental calculation strategies (+ –) Understanding x and ÷ Mental calculation strategies (x ÷) Money and 'real life' problems Making decisions, checking results	• Add three two-digit numbers using apparatus or informal methods; • Partition into tens and units and recombine; • Understand division as grouping or sharing. Read and begin to write the related vocabulary. Recognise division is inverse of multiplication ; • Use doubling and halving, starting from known facts; • Say or write division statement corresponding to multiplication statement; • Choose appropriate number operations and calculation methods to solve money or 'real life' word problems with two steps; • Explain and record method; • Check results, e.g. check division by multiplication, halving by doubling.
11	5	Fractions	• Begin to recognise simple equivalent fractions, e.g. 5/10 is equivalent to $\frac{1}{2}$, 5/5 to 1 whole.
12	5	Handling data	• Solve a given problem by organising and interpreting data in bar charts – intervals labelled in ones then twos.

Medium term plan: Summer term **Year 3**

EVERY DAY: Practise and develop oral and mental skills (e.g. counting, mental strategies, of + , − , x and ÷ facts)	
Read and write whole numbers up to 1000 Order a set of three-digit numbers Count on/back in 10s, 100s from any two-/three-digit number State subtraction fact corresponding to addition fact and vice versa Derive doubles of multiples of 5 to 50, corresponding halves Derive doubles of multiples of 50 to 500 Add/subtract 9, 19, 29… and 11, 21, 31…	Recall addition and subtraction facts for each number up to 20Recall pairs of multiples of 100 with a total of 1000 Recall pairs of multiples of 5 with a total of 100 Recall multiplication facts in x2, x5 and x10 tables and derive division facts. Count in threes from and back to zero Recall multiplication facts in x3 table and begin to derive division facts.

Unit	Days	Topic	Objectives: children will be taught to
1	3	Place value, ordering, estimating, rounding Reading numbers from scales	• Compare two three-digit numbers, say which is more or less and give a number that lies between them; • Round any three-digit number to the nearest 100; • Order a set of whole numbers to 1000; position them on a number line; • Identify unlabelled divisions on a number line or measuring scale.
2–3	10	Understanding + and –Mental calculation strategies (+ –) Money and 'real life' problems Making decisions, checking results Pencil and paper procedures	• Extend understanding of addition and subtraction; • Add several small numbers; • Add or subtract a near multiple of 10 to a two-digit number, by adding or subtracting the nearest multiple of 10 and adjusting; • Use patterns of similar calculations; • Choose appropriate number operations and calculation methods to solve money or 'real life' word problems with one or two steps; • Explain and record method. Check results; • Use informal pencil and paper methods to support, record or explain TU + TU, HTU + TU and HTU + HTU.
4–6	13	Measures, including problems Shape and space Reasoning about shapes	• Read and begin to write the vocabulary related to capacity; • Measure and compare using litres and millilitres, and know the relationship between them. Suggest suitable units and equipment to estimate or measure capacity; • Read scales. Record measurements using mixed units, to the nearest whole/half unit (e.g. 3.5 litres); • Choose appropriate number operations and calculation methods to solve measurement word problems with one or more steps; • Explain and record method; • Identify and sketch lines of symmetry, recognise shapes with no line of symmetry; • Sketch reflection of simple shape in a mirror; • Read and begin to write the vocabulary of position, direction and movement; • Recognise that a straight line is two right angles; • Compare angles with a right angle, saying whether they are more or less; • Investigate general statements about shapes, and suggest examples to match them. Explain reasoning.

Read and write whole numbers up to 1000 Count on/back in 10s, 100s from any two-three-digit number Derive doubles of multiples of 5 to 50, corresponding halves Derive doubles of multiples of 50 to 500, corresponding halves Round and three-digit number to the nearest 100 Order a set of three-digit numbers Add/subtract 9, 19, 29… and 11, 21, 31…	Recall addition and subtraction facts for each number up to 20 Recall pairs of multiples of 100 with a total of 1000 Recall pairs of multiples of 5 with a total of 100Recall multiplication facts in x2, x5, x10 tables and derive division facts Recall multiplication facts in x3 table, then in x4 table Begin to derive division facts in the x3 and x4 tables State division fact corresponding to a multiplication fact.

8	5	Counting, properties of numbers and number sequences Reasoning about numbers	• Recognise two-digit and three-digit multiples of 2, 5, and 10 and three-digit multiples of 50 and 100; • Solve number puzzles. Explain methods and reasoning orally and in writing.
9–10	10	Understanding x and ÷ Mental calculation strategies (x ÷) Money and 'real life' problems Making decisions, checking results	• Begin to find remainders after division; • Round up or down after division; • Use know facts and place value to multiply and divide mentally; • Choose appropriate number operations and calculation methods to solve money or 'real life' word problems with one or two steps; • Explain and record method. Check results.
11	5	Fractions	• Compare two familiar fractions; • Know that $\frac{1}{2}$ lies between $\frac{1}{4}$ and $\frac{3}{4}$; • Estimate a simple fraction (proportion) of a shape.
12	5	Understanding + and – Mental calculation strategies (+ –) Pencil and paper procedures Time, including problems Making decisions, checking results	• Add using pencil and paper methods; • Use known number facts and lace value to add/subtract mentally; • Use informal pencil and paper methods to support, record or explain TU-TU and HTU-TU; • Use a calendar. Choose appropriate number operations and calculation methods to solve time word problems with one or two steps; • Explain and record method. Check results.
13	5	Handling data	• Solve a given problem by organising and interpreting data in Venn and Carroll diagrams – one criterion.

Medium term plan: Autumn term **Year 4**

EVERY DAY: Practise and develop oral and mental skills (e.g. counting, mental strategies, rapid recall of + , – , x and ÷ facts)	
Read and write whole numbers up to 10000 Add/subtract 1, 10, 100 to any whole number Count on or back in 10s, 100s from any two- or three-digit number Round any three-digit number to the nearest 10 or 100 Recall addition and subtraction facts for each number up to 20	Add/subtract a pair of two-digit numbers (not crossing 10 or 100 boundary) Derive doubles of whole numbers to 50, corresponding halves Recall multiplication facts in x2, x3, x4, x5, x10 tables and derive division facts Multiply a two-digit number by 10

Unit	Days	Topic	Objectives: children will be taught to
1	3	Place value, ordering, rounding Reading numbers from scales	• Read and write whole numbers to 10000 in figures and words; • Know what each digit represents and partition into Th H T U; • Read and write the vocabulary of estimation; • Estimate up to 250 objects; • Estimate a proportion (fraction); • Read scales to a suitable degree of accuracy.
2–3	10	Understanding + and – Mental calculation strategies (+ –) Pencil and paper procedures (+ –) Money and 'real life' problems Making decisions, checking results	• Consolidate understanding of relationship between addition/subtraction; • Understand commutative law of addition; • Count on or back in repeated steps of 1, 100, 1000; • Identify near doubles. Count up through next multiple of 10, 100, 1000; • Use informal pencil and paper methods to support, record or explain addition and subtraction; • Convert £ to p. Choose appropriate number operations and calculation methods to solve money or 'real life' word problems with one/two steps; • Explain and record methods. Check with addition in a different order.

4–6	13	Measures, including problems Shape and space Reasoning about shapes	• Use, read, write km, m, cm, mm and mile; • Know and use relationships between units; • Know $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, 1/10 of 1 kilometre in m, 1 metre in cm or mm; • Suggest suitable units and equipment to estimate or measure length; • Record metres and centimetres using decimals, and other measurements using mixed units. Convert up to 1000 cm to metres and vice versa; • Measure/calculate perimeter of rectangles and simple shapes (cm); • Choose appropriate number operations and calculation methods to solve measurement word problems with one or more steps; • Explain and record methods; • Describe and visualise 3-D and 2-D shapes, including tetrahedron, heptagon; • Recognise equilateral and isosceles triangles; • Classify shapes (right angles, regularity, symmetry); • Recognise position on square grids with numbered lines; • Investigate general statements about shapes.

Read and write whole numbers up to 10000 Count on/back in 10s, 100s from any two-/three-digit number Round any three-digit number to the nearest 10 or 100 Add/subtract a pair of two-digit numbers (crossing 10 but not 100 boundary)	Derive doubles of whole numbers to 50, corresponding halves Recall addition and subtraction facts, for each number up to 20 Recall multiplication facts in x2, x3, x4, x5, x10 tables and derive division facts Multiply and divide whole numbers by 10

8	5	Properties of numbers and number sequences Reasoning about numbers	• Recognise, extend number sequences formed by counting from any number in steps of constant size, e.g. 25 to 500; • Recognise odd and even numbers up to 1000 and some of their properties, e.g. sums, differences of pairs of odd/even numbers; • Solve number puzzles, recognise patterns, generalise and predict.
9–10	10	Understanding x and ÷ Mental calculation strategies (x ÷) Pencil and paper procedures (x ÷) Money and 'real life' problems Making decisions, checking results	• Extend understanding of x and ÷ and their relationship to each other and to + and –; • Use doubling and halving of two-digit numbers, e.g. x4=double double, x5=x10 halve, x20=x10 double, x8=x4double, $\frac{1}{4}$=half on one $\frac{1}{2}$; • Approximating first, use informal pencil and paper methods to multiply and divide; • Choose appropriate number operations and calculation methods to solve money and 'real life' word problems with one or more steps; • Explain and record methods. Check with equivalent calculation.

11	5	Fractions and decimals	• Use fraction notation. • Recognise fractions that are several parts of a whole, and mixed numbers; • Find fractions of shapes; • Relate fractions to division and find simple fractions of quantities.
12	5	Understanding + and – Mental calculation strategies (+ –) Pencil and paper procedures (+ –) Time, including problems	• Consolidate understanding of subtraction as the inverse of addition; • Find a small difference by counting up; • Use relationship between + and –; • Develop written methods for + and – of whole numbers less than 1000; • Use, read and write vocabulary of time. Read time to 1 min. on analogue/12 hour digital clock. Use 9:53 am and pm. Solve time word problems.
13	5	Handling Data	• Solve a given problem by collecting, classifying, representing and interpreting data in tally charts, frequency tables, pictograms (symbols representing 2, 5, 10 units).; • Include use of computer.

Medium term plan: Spring term **Year 4**

EVERY DAY: Practise and develop oral and mental skills (e.g. counting, mental strategies, rapid recall of + , – , x and ÷ facts)	
Read and write whole numbers up to 1000 Count on/back in 10s, 100s from any two-/three-digit number Recall addition and subtraction facts for each number to 20 Round any three-digit number to the nearest 10 or 100 Add/subtract a pair of two-digit numbers (crossing 10 but not 100 boundary)	Derive doubles of multiples of 10 to 500, corresponding halves Recall multiplication facts in x2, x3, x4, x5, x10 tables and derive division facts. Derive multiplication facts in 8 times table and begin to recall them Multiply and divide whole numbers by 10Write subtraction fact corresponding to given addition fact

Unit	Days	Topic	Objectives: children will be taught to
1	3	Place value, ordering, rounding Reading numbers from scales	• Multiply and divide an integer up to 1000 by 10; understand the effect; • Read and write the vocabulary of comparing and ordering numbers; • Use symbols = <> correctly. Give a number lying between two others; • Use vocabulary of approximation; • round any positive number less than 1000 to nearest 10; • Recognise negative numbers in context: number line, thermometer.
2–3	10	Understanding + and – Mental calculation strategies (+ –) Pencil and paper procedures (+ –) Money and 'real life' problems Making decisions, checking results	• Understand principle (not name) of commutative law for + not –; • Add several small numbers by finding pairs that total 10, or 9 or 11; • Partition into tens and units, adding tens first; • Ass three two-digit multiples of 10; • Develop/refine written methods for addition/subtraction, including money; • Choose appropriate number operations and calculation methods to solve money and 'real life' word problems with one or more steps; • Explain working. Check with an equivalent calculation.

5–6	8	Measures, and time, including problems Shape and space Reasoning about shapes	• Estimate and check times using seconds, minutes, hours; • Measure and compare using kilograms and grams and know and use the relationship between them. Know $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ and 1/10 of 1 kg in grams; • Suggest suitable units and equipment to estimate or measure mass; • Read scales; • Record measurements to suitable degree of accuracy, using mixed units, or the nearest whole/half/quarter unit (e.g. 3.25kg); • Measure and calculate area of rectangles and simple shapes, using counting methods and standard units (square centimetres); • Choose appropriate number operations and calculation methods to solve measurement word problems with one or more steps. Explain working; • Make shapes and discuss properties; • Visualise solid shapes from 2-d drawings; • Identify simple nets; • Recognise clockwise, anti-clockwise; • Start to draw, measure and order angles; • Use eight compass point; • Recognise horizontal and vertical lines; • Solve shape problems or puzzles; • Explain reasoning and methods.

Read and write whole numbers up to 10000 Count on or back in equal steps including below zero Derive doubles of multiples of 10 to 500, corresponding halves Round any three-digit number to the nearest 10 or 100 Add/subtract two two-digit numbers (crossing 10 but not 100 boundary).	Recall addition and subtraction facts for each number up to 20 Recall multiplication facts in x2, x3, x4, x5, x10 tables and derive division facts. Derive multiplication facts in x6 table and begin to recall them Multiply and divide whole numbers by 10 Derive addition pairs that total 100, multiples of 50 that total 1000

8	5	Properties of numbers and number sequences Reasoning about numbers	• Recognise, extend number sequences formed by counting from any number in steps of constant size, extend beyond zero if counting back; • Investigate general statements about familiar numbers; • Explain methods and reasoning.

9–10	10	Understanding x and ÷ Mental calculation strategies (x ÷) Pencil and paper procedures (x ÷) Money and 'real life' problems Making decisions, checking results	• Understand commutative and associative laws of multiplication; • Divide a whole number of £ by 2, 4, 5 or 10 to give £/p. • Use closely related facts, e.g. derive x9 or x11 from x10, or derive x6 from x4 plus x2; • Partition and multiply; • Develop and refine written methods of Tu x U; • Choose appropriate number operations and calculation methods to solve money and 'real life' word problems with one or more steps; • Explain working; • Check with inverse operation.
11	5	Fractions and decimals	• Recognise equivalence of simple fractions; • Identify two fractions with total of 1; • Compare a fraction with one half, and say whether it is greater or less; • Use decimal notation for tenths, hundredths (money, metres and centimetres) and use in context. Round to the nearest £ or metre; • Convert £ to p, or metre to centimetres and vice versa; • Order decimals with two places.
12	5	Handling data	• Solve a given problem by collecting, classifying, representing and interpreting data in bar charts; intervals labelled in 2s, 5s, 10s, 20s; • Include use of computer.

Medium term plan: Summer term **Year 4**

EVERY DAY: Practise and develop oral and mental skills (e.g. counting, mental strategies, rapid recall of + , − , x and ÷ facts)	
Read and write whole numbers up to 10000 Add/subtract 10, 100, 1000 from any two-/three-digit number Derive doubles of multiples of 100 to 5000, corresponding halves Round any three-digit number to the nearest 10 or 100 Add/subtract a pair of two-digit numbers (crossing 10 but not 100 boundary)	Recall addition and subtraction facts for each number to 20 Derive addition pairs that total 100 and multiples of 50 that total 1000 Recall multiplication facts in x2, x3, x4, x5, x10 tables and derive division facts Begin to recall facts in x6 and x8 tables Multiply or divide whole numbers by 10 or 100 Multiply TU by U, e.g. 13x3

Unit	Days	Topic	Objectives: children will be taught to
1	3	Place value, ordering, rounding Reading numbers from scales	• Begin to multiply whole numbers by 100; • Order a set of whole numbers up to 10000; • Round any positive integer to the nearest 10 or 100; • Read a variety of scales and dials to a suitable degree of accuracy.
2–3	10	Understanding + and – Mental calculation strategies (+ –) Pencil and paper procedures (+ –) Money and 'real life' problems Making decisions, checking results	• Understand the principles of associative law for addition (not name); • Add or subtract the nearest multiple of 10 and adjust; • Use number facts and place value to add/subtract mentally any pair of two-digit whole numbers; • Develop, refine written methods for column addition/subtraction; • Add more than two whole numbers less than 1000, and money; • Choose appropriate operations and calculation methods to solve money and 'real life' word problems with one or more steps; • Explain working; • Check using knowledge of sums of odd/even numbers;
4–6	13	Measures, including problems Shape and space Reasoning about shapes	• Use, read, write, litre (l), millilitre (ml), pint; • Know $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 1/10 of 1 litre in ml; • Suggest suitable units and equipment to estimate or measure capacity; • Read scales; • Record measurements to suitable degree of accuracy, using mixed units, or the nearest whole/half/quarter unit (e.g. 3.25 litres); • Choose appropriate number operations and calculation methods to solve measurement word problems with one or more steps; • Explain working; • Sketch reflection of simple shape in a mirror; • Read and begin to write the vocabulary of movement; • Make and describe patterns involving translation; • Begin to measure angles in degrees; • Know whole turn 360, 4 right angles; quarter turn, 90, 1 right angle; half turn, 180, 2 right angles; • Recognise 45 as half a right angle.

Read and write whole numbers up to 10000 Count on/back in equal steps including beyond zero Recall addition and subtraction facts for each number to 20 Round any three-digit number to the nearest 10 or 100 Add/subtract any pair of two-digit numbers (including crossing 10 and 100 boundary).	Derive doubles of multiples of 100 to 5000, corresponding halves Derive addition pairs that total 100, multiples of 50 that total 1000 Recall multiplication facts in x2, x3, x4, x5, x10 tables and derive division facts. Begin to recall facts in x6 and x8 tables Derive facts in x9 table, e.g. from 10 lots subtract 1 lot Multiply by partitioning, e.g. 23x4

8	5	Properties of numbers and number sequences Reasoning about numbers	• Recognise multiples of 2, 3, 4, 5, 10 up to 10th multiple; • Solve number problems and puzzles; • Explain methods and reasoning orally and in writing.
9–10	10	Understanding x and ÷ Mental calculation strategies (x ÷) Pencil and paper procedures (x ÷) Money and 'real life' problems Making decisions, checking results	• Understand distributive law; • Round up or down after division; • Use relation between x and ÷; • Use known facts to multiply and divide; • Develop and refine written methods for TU ÷ U; • Choose appropriate operations and calculation methods to solve many and 'real life' word problems with one or more steps; • Explain working; • Check results by approximating.
11	5	Fractions and decimals	• Begin to use ideas of simple proportion; • Recognise the equivalence of decimal, fraction forms of one half, one quarter and tenths.
12	5	Understanding + and – Mental calculation strategies (+ –) Pencil and paper procedures (+ –) Time, including problems	• Consolidate understanding of addition and subtraction; • Add/subtract mentally any pair of two-digit whole numbers; • Refine column addition and subtraction; • Read timetables and use this year's calendar; • Solve problems involving time.
13	5	Handling data	• Solve a given problem by collecting, classifying, representing and interpreting data in Venn and Carroll diagrams: two criteria; • Use a computer and a branching tree program to sort shapes or numbers.

Medium term plan: Autumn term **Year 5**

EVERY DAY: Practise and develop oral and mental skills (e.g. counting, mental strategies, rapid recall of + , − , x and ÷ facts)	
Read and write whole numbers up to 100000 Count on/back in equal steps (e.g. 25, 100) including beyond zero Round any three- or four-digit number to nearest 10 or 100 Recall addition and subtraction facts for each number up to 20 Add/subtraction any pair of two-digit numbers, including crossing 100	Find pairs with sum of 100; derive multiples of 50 with a sum of 1000 Double or halve any whole number of 100 Recall facts in times x2, x3, x4, x5, x6, x10 tables and derive division facts Begin to recall facts in x7, x8, x9 tables, squares to 10x10 Multiply or divide whole numbers up to 10000 by 10 or 100

Unit	Days	Topic	Objectives: children will be taught to
1	3	Place value, ordering, rounding Using a calculator	• Read and write whole numbers in figures and in words and know what each digit represents; • Multiply and divide any positive whole number up to 10000 by 10 or 100 and understand the effect; • Use the vocabulary of comparing and order numbers ; • Give one or more numbers lying between two others; • Develop calculator skills and use a calculator effectively.
2–3	10	Understanding x and ÷ Mental calculation strategies (x ÷) Pencil and paper procedures (x ÷) Money and 'real life' problems Making decisions, checking results, including using a calculator	• Understand the effect of and relationships between the four operations, and the principles of the arithmetic laws as they apply to multiplication; • Use doubling/halving: double any two-digit number, halve an even number, double the other, multiply by 25 by x100, then ÷ 4; multiply by 16 by x8, then double; find 1/6 by halving 1/3; • Approximate first. Use informal pencil and paper method to support, record or explain x and ÷; • Extend written methods to HTU x U or U.t x U; • Use all four operations to solve money or 'real life' word problems; • Choose appropriate operations/calculation methods. Explain working; • Check by estimating; • Use inverse operation.
4–5	10	Fractions, decimals and percentages Ratio and proportion	• Use fraction notation, including mixed numbers and vocabulary numerator and denominator; • Change an improper fraction to a mixed number; • Recognise simple equivalent fractions, including tenths and hundredths; • Use decimal notation for tenths and hundredths, know what each digit represents in numbers with up to two decimal places; • Begin to understand percentage as the number of parts in every 100; • Solve simple problems involving ration (one for every).
6	8	Handling data Using a calculator	• Discuss chance or likelihood; • Present and interpret data on a bar chart and bar line graph: axis in 2s, 5s, 10s, 20s, 100s; • Recognise when intermediate points have no meaning; • Make a simple database on paper. Identify the mode;

Read and write whole numbers to at least 100000 Count on/back in equal steps (e.g. 25, 100, 0.1) including beyond zero Round any three- or four- digit number to nearest 10 or 100 Recall addition and subtraction facts for each number up to 20 Add/subtract any pair of two-digit numbers, including crossing 100	Double any whole number to 100 and multiples of 10 to 1000 Recall facts in x2, x3, x4, x5, x6, x10 tables and derive division facts Begin to recall multiplication facts in x7, x8, x9 tables, squares to 10 x 10 Multiply of divide whole numbers up to 10000 by 10 or 100 Convert metres to centimetres and £ to pence and vice versa

8–10	15	Shape and space Reasoning about shapes Measures, including problems	• Identify and recognise properties of rectangles; • Classify triangles, isosceles, equilateral, scalene, lines of symmetry; • Recognise positions, read and plot co-ordinates in first quadrant; • Solve shape puzzles; • Explain methods and reasoning orally and in writing; • Understand, measure and calculate perimeter of rectangles, regular polygons; • Measure and draw lines to nearest mm; • Use, read and write standard metric units of length, abbreviations and relationships. Convert larger to smaller units of length. Know mile; • Read the time on 24 hour digital clock, e.g. 19:53; • Suggest suitable units/equipment to estimate or measure length. Record estimates/measurements from scales to suitable degree of accuracy; • Use all four operations to solve measurement word problems, including time. Choose appropriate operations/calculation methods. Explain working.
11	5	Mental calculation strategies (+ –) Pencil and paper procedures (+ –) Money and 'real life' problems Making decisions, checking results, including using a calculator	• Find difference by counting up through next multiple of 10, 100, 1000; • Partition into HTU and add most significant digits first; • Use informal pencil and paper methods; • Extend written methods +/- of two integers less than 10000; • Use all four operations to solve money of 'real life' word problems; • Choose appropriate operations/calculation methods; • Explain working; • Check calculations using inverse operation, including with calculator.
12	5	Properties of numbers and number sequences Reasoning about numbers	• Recognise and extend number sequences formed by counting from any number in steps of constant size, extend beyond zero when counting back; • Know squares to at least 10x10; • Identify factors of two-digit numbers; • Solve mathematical problems or puzzles; • Recognise patterns, generalise.

Medium term plan: Spring term **Year 5**

EVERY DAY: Practise and develop oral and mental skills (e.g. counting, mental strategies, rapid recall of + , – , x and ÷ facts)	
Read and write whole numbers to at least 100000 Count on/back in equal steps (25, 100, 0.1, 0.2), including beyond zero Round decimals to nearest whole number. Order fractions Recall addition and subtraction facts for each number up to 20 Add/subtract any pair of two-digit numbers, including crossing 100	Find pairs with sim of 100, multiples of 50 sum 1000, decimals sum 1, 10 Use doubling to multiply two-digit numbers by 4. Halve any two-digit number. Recall facts in x2, x3, x4, x5, x6, x10 tables; derive division facts Begin to recall facts in x7, x8, x9 tables and begin to derive ÷ facts Multiply or divide whole numbers up to 10000 by 10 or 100

Unit	Days	Topic	Objectives: children will be taught to
1	3	Place value, ordering, rounding Using a calculator	• Use symbols < = > ≤ ≥ ; • Order a set of whole numbers less than 1 million; • Order positive and negative integers (number line, temperature); • Develop calculator skills and use a calculator effectively.
2–3	10	Understanding x and ÷ Mental calculation strategies (x ÷) Pencil and paper procedures (x ÷) Money and 'real life' problems Making decisions, checking results, including using a calculator	• Begin to use brackets; • Use factors; • Use closely related facts (derive x19 from x20, x12 from x10 add x2); • Partition, e.g. 47 x 6; • Extend written methods to HTU ÷ U (whole number remainder); • Convert £ to foreign currency; • Use all four operations to solve money or 'real life' word problems; • Choose appropriate operations/calculation methods; • Explain working; • Check with inverse operation or equivalent calculation.
4	5	Fractions, decimals and percentages Using a calculator	• Order a set of fractions including mixed numbers, position on a number line; • Relate fractions to division and find simple fractions, including 1/10 and 1/100 of numbers and quantities; • Order a set of numbers of measurements with same number of decimal places; • Round a number with one or two decimal places to the nearest integer; • Use a calculator effectively, e.g. to convert fractions to decimals, to find fractions of numbers.
5	8	Shape and space Reasoning about shapes	• Visualise 3-D shapes from 2-D drawings and identify nets of open cube; • Recognise directions and perpendicular and parallel lines; • Understand and use degrees; • Identify, estimate and order acute and obtuse angles to 5 ; • Make patterns from rotating shapes; • Calculate angles in a straight line; • Recognise and explain patterns and relationships, generalise and predict.

Read and write whole numbers to at least 100000 Order a set of positive and negative whole numbers Round decimals to nearest whole number. Order fractions Recall addition and subtraction facts for each number up to 20 Add/subtract any pair of two-digit numbers, including crossing 100	Use doubling to multiply two-digit numbers by 4. Halve any two-digit number Recall facts in x2, x3, x4, x5, x6, x10 tables; derive division facts Recall facts in x7, x8, x9 tables and begin to derive division facts Multiply or divide whole numbers up to 10000 by 10 or 100 Convert m to cm and £ to pence, and vice versa; convert kg to g

7–8	5	Measures including problems Handling data	• Understand area measured in square centimetres. Use formula in words for area of rectangle; • Use, read and write standard metric units of mass, abbreviations; • Know relationships between them; • Convert larger to smaller units of mass; • Suggest suitable units and equipment to estimate or measure mass; • Read measurements from scales; • Use all four operations to solve measurement word problems; • Choose appropriate operations/calculation methods; • Explain working; • Represent and interpret data in a line graph (e.g. weight of baby at monthly intervals from birth to one year); • Recognise when points can be joined to show trends.
9–10	10	Mental calculation strategies (+ –) Pencil and paper procedures (+ –) Money and 'real life' problems Making decisions, checking results, including using a calculator	• Identify near doubles, e.g. 1.5 + 1.6; • Add/subtract multiple of 10 or 100 and adjust; • Use relationship between addition and subtraction; • Extend written methods to addition of more than 2 integers less than 10000, and + and – of pair of decimals both with 1 or 2 decimal places; • Use all four operations to solve word problems involving money; • Use all four operations to solve money or 'real life' word problems; • Choose appropriate operations/calculation methods; • Explain working; • Check by adding in reverse order, including with calculator.
11	5	Properties of numbers and number sequences Reasoning about numbers	• Recognise multiples of 6, 7, 8, 9 up to the 10^{th} multiple; • Recognise and extend sequences formed by adding 6, 7, 8, 9…, starting from any number; • Know and apply tests of divisibility by 2, 4,5, 10 or 100; • Make and investigate a general statement about numbers, by finding examples that satisfy it; • Suggest extensions.

Medium term plan: Summer term **Year 5**

EVERY DAY: Practise and develop oral and mental skills (e.g. counting, mental strategies, rapid recall of + , – , x and ÷ facts)	
Read and write any whole number; round to nearest 10 or 100 Order positive and negative whole numbers; order fractions Round decimals to nearest whole number Know simple fractions as percentages Recall addition and subtraction facts for each number up to 20 Add/subtract any pair of two-digit numbers, including crossing 100	find pairs with sim of 100, multiples of 50 sum 1000, decimals sum 1, 10 Use doubling and halving to multiply or divide two-digit numbers by 4 Recall facts in x2, x3, x4, x5, x6, x10 tables; derive division facts Recall facts in x7, x8, x9 tables and begin to derive division facts Multiply or divide whole numbers up to 10000 by 10 or 00 Partition to multiply by 2, 5 or 10 and use tests of divisibility

Unit	Days	Topic	Objectives: children will be taught to
1	3	Place value, ordering, rounding Using a calculator	• Use vocabulary of estimation and approximation; • Make and justify estimates or large numbers and estimate simple proportions; • Round to the nearest 10, 100, or 1000; • Calculate a temperature rise or fall across 0 c; • Develop calculator skills and use a calculator effectively;
2–3	10	Understanding x and ÷ Mental calculation strategies (x ÷) Pencil and paper procedures (x ÷) Money and 'real life' problems Making decisions, checking results, including using a calculator	• Express a quotient as a fraction, or as a decimal when dividing a whole number by 2, 4, 5, 10 or when dividing £ and pence; • Round up or down depending on the context; • Use relationship between x and ÷; • Use known facts and place value to multiply and divide mentally; • Extend written methods to TU x TU (long multiplication); • Use all four operations to solve money or 'real life' word problems, including percentages; • Choose appropriate operations/calculation methods; • Explain working; • Check results.
4–5	10	Fractions, decimals and percentages Ratio and proportion	• Relate fractions to decimal forms (including tenths, hundredths) and to percentages; • Find fractions and simple percentages of whole number quantities; • Solve problems involving ration (1 for every) and proportion (1 in every).
6	8	Handling data Using a calculator	• Solve a problem by representing and interpreting data in bar line charts: axis in 2s, 5s, 10s, 20s, 100s; • Discuss cases where intermediate points have no meaning and cases where points where lines may be joined to show trend; • Find the mode and calculate the range of a set of data; • Use a computer to compare different presentations of the same data.

Read and write any whole number; round to nearest 10 or 100 Order a positive and negative whole numbers; order fractions Order decimals with the same number of decimal laces Know simple fractions as percentages/decimals Find simple percentages Add/subtract any pair of two-digit numbers, including crossing 100	Find pairs with sim of 100, multiples of 50 sum 1000, decimals sum 1, 10 Use doubling and halving to multiply or divide two-digit numbers by 4 Recall multiplication facts to 10 x 10 and derive all division facts Identify pairs of factors of small two-digit numbers Multiply or divide whole numbers up to 10000 by 10 or 100 Partition to multiply by 2, 3, or 10 and use tests of divisibility Convert £ to pence, m to cm, km to m, kg to g and litres to millilitres

8–10	15	Shape and space Reasoning about shapes Measures, including problems	• Recognise reflective symmetry in regular polygons; • Complete symmetrical patterns with two lines of symmetry at right angles; • Reflect shapes in mirror parallel to one side; • Recognise where shape will be after translation; • Make and investigate a general statement about shapes; • Use timetables. Know and use relationships between units of time; • Use, read and write standard metric units of capacity, including gallons to pints; • Suggest suitable units and equipment to estimate or measure capacity; • Read measurements from scales; • Use all four operations to solve measurement word problems, including time; • Choose appropriate operations/calculation methods; • Explain working.
11	5	Mental calculation strategies (+ –) Pencil and paper procedures (+ –) Money and 'real life' problems Making decisions, checking results, including using a calculator	• Add several numbers; • Use known facts and place value for mental addition and subtraction; • Extend written methods addition and subtraction of integers less than 10000 and decimals with up to two decimal places; • Use all four operations to solve money or 'real life' word problems, including percentages; • Choose appropriate operations/calculation methods; • Explain working; • Check using sums; • Differences of odd or even numbers.
12	5	Properties of numbers and number sequences Reasoning about numbers	• Find all the pairs of factors of any number up to 100; • Make general statements about odd and even numbers, including sums and differences; • Explain a generalised relationship in words.

Medium term plan: Autumn term **Year 6**

Unit	days	topic	Objectives: children will be taught to
1	3	Place value	• Multiply and divide decimals by 10 or 100 and integers by 1000, explain the effect; • Identify and use appropriate operations (including combinations of operations) to solve problems involving numbers and quantities based on 'real life' or money, using one or more steps.
2	5	Multiplication and division, mental methods	• Use the relationship between multiplication and division; • Use related facts and doubling and halving; • Identify and use appropriate operations (including combinations of operations) to solve word problems; • Approximate first.
3	5	Multiplication and division, written methods	• Use pencil and paper methods to support, record or explain multiplications and divisions; • Extend written methods to short multiplication of numbers involving decimals; • Round up or down after division, depending on context; • Identify and use the appropriate operations (including combinations of operations) to solve word problems involving numbers and quantities; • Develop calculator skills and use a calculator effectively.
4	5	Fractions, decimals and percentages	• Reduce a fraction to its simplest form by cancelling common factors; • Recognise the equivalence between the decimal and fraction forms; • Use decimal notation for tenths and hundredths; extend to thousandths for measurements; • Know what each digit represents; • Understand percentage as the number of parts in every 100; • Find simple percentages of small whole number quantities.
5	5	Fractions, decimals and percentages ratio and proportion	• Round a number with two decimal places to the nearest tenth or to the nearest whole number; • Recognise the equivalence between the decimal and fraction forms; • Solve simple problems involving ratio and proportion.
6a	5	Handling data	• Use the language associated with probability to discuss events, including those with equally likely outcomes; • Solve a problem by representing, extracting and interpreting data in tables, graphs, charts and diagrams, including those generated by a computer, for example; line graphs, bar charts with groups discrete data; • Find the mode and range of a set of data; • Begin to find the median and mean of a set of data.
6b	3	Using a calculator	• Develop calculator skills and use a calculator effectively; • Check with the inverse operations when using a calculator; • Check with an equivalent calculation.

8	5	Shape and space Reasoning about shapes Measures	• Classify quadrilaterals using criteria such as parallel sides, equal angles, equal sides…; • Solve mathematical problems or puzzles, recognise and explain patterns and relationships (orally and in writing); • Calculate perimeter of rectangles and area of simple compound shapes that can be split into rectangles.
9	5	Measures	• Use, read and write standard metric units of length, km, m, cm, mm, including their abbreviations and relationships between them; • Convert smaller units to larger and vice versa: m to km, cm or mm to m; • Suggest suitable units and measuring equipment to estimate or measure length; • Identify and use appropriate operations to solve word problems involving numbers and quantities (based on 'real life' or measures); • Know rough equivalents of miles and kilometres; • Appreciate different times around the world.
10	5	Shape and space Position, movement an scales, and solve problems	• Read and plot co-ordinates in all four quadrants; • Recognise where a shape will be after two translations; • Identify and use appropriate operations (including combinations of operations) to solve word problems involving numbers and quantities based on 'real life' or measures (including time), using one or more steps; • Choose and use appropriate number operations to solve problems and appropriate ways of calculating (mental, mental with jottings, written methods, calculator). • Explain methods and reasoning; • Record estimates and readings from scales to a suitable degree of accuracy; • Know imperial units, know rough equivalents of lb and kg, oz and g, miles and km, litres and pints or gallons.
11	5	Addition and subtraction, problems and checking solutions	• Find a difference by counting up; add or subtract the nearest multiple of 10 100 or 100, then adjust; • Use informal pencil and paper methods to support, record or explain additions and subtractions; • Extend written methods to column addition and subtraction of numbers involving decimals; • Identify and use appropriate operations to solve word problems involving numbers and quantities; • Check with the inverse operation when using a calculator.
12	5	Number sequences	• Solve mathematical problems or puzzles, recognise and explain patterns and relationships, generalise and predict; • Recognise and extend number sequences, such as the sequence of square numbers, or the sequence of triangular numbers; • Explain methods and reasoning, orally and in writing; • Develop from explaining a generalised relationship in words to expressing it in a formula using letters as symbols.

Medium term plan: Spring term **Year 6**

Unit	days	topic	Objectives: children will be taught to
1	3	Place value	• Find the difference between a positive and a negative integer, or two negative; integers, in the context such as temperature or a number line, and order a set of positive and negative integers; • Order a mixed set of numbers or measurements with up to 3 decimal places; • Consolidate rounding an integer to the nearest 10, 100 or 1000; • Round a number with two decimal places to the nearest tenth or nearest whole number; • Develop calculator skills and use a calculator effectively.
2	5	Multiplication and division 1	• Use known facts and place value to consolidate mental multiplication and division; • Use the relationship between multiplication and division; • Express a quotient as a fraction or as a decimal rounded to 1 decimal place; • Dividing £ and p by a two-digit number to give £ and p; • Round up or down after division depending on context; • Develop calculator skills and use a calculator effectively.
2	5	Multiplication and division 2	• Understand and use the relationship between the four operations, and the principles (not the names) of the arithmetic laws; • Use brackets; • Use factors; • Use closely related facts; • Extend written methods to: long multiplication of a three-digit by a two-digit integer; short division of TU or HTU by U (mixed-number answer); short division of numbers involving decimals.
3	5	Problem solving	• Choose and use appropriate number operations to solve problems, and appropriate ways of calculating: mental, mental with jottings, written methods, calculator; • Explain methods and reasoning; • Check with an equivalent calculation; • Develop calculator skills and use a calculator effectively.
4	5	Fractions, decimals and percentages 1	• Order fractions by converting them to fractions with a common denominator, and position them on a number line; • Use a fraction as an 'operator' to find fractions of numbers or quantities; • Change a fraction to the equivalent mixed number; • Begin to convert a fraction to decimal using division; • Express simple fractions as percentages; • Find simple percentages of small whole number quantities; • Develop calculator skills and use a calculator effectively.

5a	5	Rotations and reflections	• Recognise where a shape will be after a rotation through 90° about one of its vertices; • Recognise where a shape will be after reflection: in a mirror line touching the shape at a point (sides of shape not necessarily parallel or perpendicular to the mirror line); in two mirror lines at right angles (sides of shape all parallel or perpendicular to mirror line).
5b	3	Addition and subtraction	• Use known number facts and place value to consolidate mental +/-; • Extend written methods to column +/- of numbers involving decimals; • Identify and use appropriate operations (including combinations of operations) to solve word problems involving numbers and quantities; • Explain methods and reasoning; • Develop calculator skills and use a calculator effectively; • Check with the inverse operation when using a calculator; • Check the sum of several numbers by adding in reverse order; • Estimate by approximating then check result.
7	5	Angles, 2D and 3D shape, perimeter and area	• Recognise and estimates angles; • Use a protractor to measure and draw acute and obtuse angles to the nearest degree; • Check that the sum of the angles in a triangle is 180 degrees; • Calculate angles in a triangle or around a point; • Describe and visualise properties of solid shapes such as parallel or perpendicular faces or edges; • Visualise 3D shapes from 2D drawings and identify different nets for a closed cube; • Calculate the perimeter and area of simple compound shapes that can be split into rectangles.
8	5	Measures and problem solving	• Use, read and write standard metric units (km, m, cm, mm, kg, g, l, cl, ml) of length, mass and capacity, including their abbreviations, and relationships between them; • Convert smaller to larger units (e.g. m to km, cm or mm to m, g to kg, ml to l) and vice versa; • Know rough equivalents of lb and kg, oz and g, mls and km, litres and pints or gallons.
9	5	Ratio, prop, data handling and problem solving	• Identify and use appropriate operations (including combinations of operations) to solve word problems involving numbers and quantities based on 'real life', money or measures, using one or more steps, and calculating percentages such as VAT; • Suggest suitable units to estimate or measure length, mass or capacity; • Suggest suitable measuring equipment; • Record estimates and readings from scales to a suitable degree of accuracy; • Solve simple problems involving ratio and proportion; • Solve a problem by representing, extracting and interpreting data in tables, graphs, charts and diagrams, including those generated by a computer, e.g.:

			line graphs; frequency tables and bar charts with grouped discrete data.
10	5	Properties of and reasoning about number	• Make general statements about odd or even numbers, including the outcome of products; • Know and apply simple tests of divisibility; • Find simple common multiples; • Recognise prime numbers to at least 20; • Factorise numbers to 100 into prime factors; • Explain methods and reasoning, orally and in writing; • Solve mathematical problems or puzzles, recognise and explain patterns and relationships, generalise and predict; • Suggest extensions asking 'What if . . . ?; • Develop from explaining a generalised relationship in words to expressing it in a formula using letters as symbols (e.g. the cost of *n* articles at 15p each).

Medium term plan: Summer term **Year 6**

Unit	days	topic	Objectives: children will be taught to
1	5	Decimals, fractions and percentages	• Multiply and divide decimals mentally by 10 or 100 and integers by 1000, and explain the effect; • Order a mixed set of numbers with up to three decimal places; • Consolidate rounding an integer to the nearest 10, 100 or 1000; • Round a number with two decimal places to the nearest tenth or whole number; • Reduce a fraction to its simplest form by cancelling common factors; • Use a fraction as operator to find fractions of numbers or quantities; • Understand percentage as the number of parts in every 100; • Find simple percentages of small whole-number quantities.
2	5	Calculations	• Consolidate all (mental calculation) strategies from previous years; • Extend written methods to column addition and subtraction of decimals; • Derive quickly division facts corresponding to tables up to 10 x 10; • Extend written methods to: - Short multiplication of numbers involving decimals - Long multiplication of a three-digit by a two-digit integer - Short division of numbers involving decimals; • Explain methods and reasoning; • Use a calculator effectively; • Check results of calculations.
3	5	Shape and space	• Read and plot co-ordinates in all four quadrants; • Use a protractor to measure and draw angles to nearest degree; • Calculate perimeter and area of compound shapes that can be split into rectangles; • Classify quadrilaterals; • Calculate angles in a triangle or around a point; • Visualise 3-D shapes from 2-D drawing and identify different nets for a closed cube; • Recognise where a shape will be after reflection; • Recognise where a shape will be after two translations.
4	5	Problem solving 1	• Solve a problem by representing, extracting and interpreting data in tables, graphs, charts and diagrams, including those generated by a computer, e.g.: line graphs, frequency tables and bar charts with grouped discrete data; • Find the mode and range of a set of data; • Begin to find the median and mean of a set of data; • Use the language associated with probability to discuss events, including those with equally likely outcomes; • Identify and use appropriate operations (including combinations of operations to solve word problems involving numbers and quantities) based

			on 'real life' or money, using one or more steps; • Explain methods and reasoning.
5	5	Problem solving 2	• Identify and use appropriate operations (including combinations of operations) to solve word problems involving numbers and quantities based on 'real life'; money or measures (including time), using one or more steps, including converting pounds to foreign currency, or vice versa, and calculating percentages such as VAT.; • Explain methods and reasoning; • Solve simple problems involving ratio and proportion; • Know rough equivalents of lb and kg,oz and g,miles and km,litres and pints,g; • Develop from explaining a generalised relationship in words to expressing it in a formula using letters as symbols, e.g. the cost of n articles at 15p; • Solve mathematical problems or puzzles, recognise and explain patterns and relationships, generalise and predict. Suggest extensions asking 'What if…?'
6	5	Division, decimals and problem solving	• Derive quickly division facts corresponding to multiplication tables up to 10 x 10; • Order a mixed set of numbers with up to three decimal places; • Solve a problem by extracting and interpreting information presented in tables, graphs and charts.
7	5	Perimeter, area, Calculation Problem solving	• Carry out column addition and subtraction of numbers involving decimals; • Calculate the perimeter and area of simple compound shapes that can be split into rectangles; • Identify and use the appropriate operations (including combinations of operations) to solve word problems involving numbers and quantities and explain methods and reasoning.
8	5	Calculation, ratio percentage and problem solving	• Multiply and divide decimals mentally by 10 or 100 and integers by 1000, and explain the effect; • Understand percentage as the number of parts in every 100 and find simple percentages of whole-number quantities; • Solve simple problems involving ratio and proportion.
9	5	Calculation and problem solving	• Carry out short multiplication and division of numbers involving decimals; • Carry out long multiplication of a three-digit by a two-digit integer; • Identify and use appropriate operations (including combinations of operations) to solve problems involving numbers and quantities, and explain methods and reasoning; • Choose and use appropriate number operations to solve problems and appropriate ways of calculating: mental, mental with jottings, written methods, and calculator; • Factorise numbers into prime factors; • Develop calculator skills and use a calculator effectively.
10	5	Fractions, proportion, ratio	• Reduce a fraction to its simplest form by cancelling common factors; • Use a fraction as an 'operator' to find fractions of numbers or quantities,

		and problem solving	e.g. $^{5}/_{8}$ of 32, $^{7}/_{10}$ of 40, $^{9}/_{100}$ of 400 centimetres; • Solve simple problems involving ratio and proportion.
11	5	Angles, graphs and problem solving	• Use a protractor to measure acute and obtuse angles to the nearest degree. • Read and plot co-ordinates in all four quadrants. • Solve a problem by extracting and interpreting information presented in tables, graphs and charts.