The Treehouse School
Nature, nurture and nourishment

MATHEMATICS POLICY

This Policy was last reviewed in August 2017.

The Policy will next be reviewed and updated in August 2019.

Trustee with Responsibility: Eve Evans – Learning and Teaching Team.

MATHEMATICS POLICY

Rationale

At The Treehouse School we recognise that maths is essential to everyday life, critical to science, technology and engineering and therefore vital in the workplace. In preparation for which, we imbue our children with core mathematical skills, positive attitudes and the ability to draw on an array of strategies, ready for the next stage of their education. In responding to children's developmental needs, rather than their chronological age, our mathematics curriculum recognises that some concepts need to be delivered in structured lessons, using concrete apparatus to provide them with secure foundations, that are embedded; whilst other concepts are best delivered in everyday contexts, where they are purposeful and independent of the abstract.

Principles

We aim to develop:

- Positive attitudes towards mathematics and an awareness of its relevance in everyday life
- Competence and confidence in mathematical knowledge, skills and concepts
- The ability to solve problems, to reason, think logically; working systematically and with accuracy
- Initiative and ability to work both independently and in cooperation with others
- The ability to communicate mathematical ideas
- The ability to use and apply mathematics across the curriculum and in real life

Breadth of Study

Through careful planning, continuous assessment and preparation, we aim to ensure that throughout the school children are given opportunities for:

- Practical activities and mathematical games
- Problem solving
- Individual, paired, group and whole class discussions and activities
- Open and closed tasks
- A range of methods including mental, pencil and paper and using a calculator

In addition to which we seek to identify and exploit opportunities to apply and extend mathematical concepts in all areas of the curriculum.

Planning and Organisation

Teachers are responsible for planning for their group, with guidance from a 'consultant'. The approach to the teaching of mathematics within the school is based on three key principles:

- Formal lessons, for which, the children are divided into three groups. These groups are determined by developmental stage rather than chronological age.
- Some concepts such as Time and Measure are woven into our daily systems and routines in contexts that enable them to make sense e.g. being on time for different parts of the day, cooking with accuracy, estimating and measuring the weight/height/ length/capacity or finding the cost of everyday objects.
- An emphasis on mental skills e.g. tables knowledge, which need to be rehearsed regularly both within and beyond the school day to become embedded.

The National Curriculum for Mathematics 2014 is used as a reference point in planning to ensure both consistency and progression. (Appendix 1).

Assessment

A combination of formative and summative assessment is used in mathematics. Teachers continually assess children's skills both in and beyond lessons, identifying and responding to areas for development. During Focus weeks, three times a year, children are levelled using Ferre Laever's

criteria; this information is then collated on a spreadsheet, to track both individual and cohort progress.

This policy is reviewed bi-annually, to enable staff to evaluate its impact and effectiveness.

Appendix 1 - Maths Progression

SKILLS	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
NUMBER Counting	I can put a model of numbers in order. Such as Numicon or dice numbers. I can recite numbers in order to 10. I can count objects up to 10. I can count actions or objects which cannot be moved. I can count out up to six objects from a larger group.	I can count to and across 100 forwards and backwards I can count in multiples of 2, 5 and 10 forwards and backwards I can count, read and write numbers to 100 I can identify one more and one less	I can count from 0 in multiples of 2, 3 and 5 I can count in 10s from any number forwards or backwards I can count in ½ and ¼ steps up to 10	I can count from 0 in multiples of 4, 8, 50 and 100 I can use number stories to count in steps of 3 and 5 from any number I can count up and down in 1/10 steps	I can count in multiples of 6, 7, 9, 25 and 1000 I can use number stories to count in steps of 4, 8, 50 and 100 from any number I can count backwards through 0 I can count up and down in 1/100	I can count in steps of any size from any number I can count in fraction steps	I can count in steps of any size from any number I can calculate intervals across 0
NUMBER Place value			**I can recognise place value in 2 digit numbers**	I can recognise place value in 3 digit numbers I can find 10 or 100 more or less than any number	I can recognise place value in 4 digit numbers and decimals to 1 place I can find 1000 more or less than any number	I can recognise place value in 5 digit numbers and decimals to 2 places I can multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	**I can determine the place value of digits in any number to 3 decimal places**

SKILLS	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
NUMBER Reading, writing and comparing	I can recognise numerals of personal significance. Ir5 can recognise numerals 1 to 5.	I can read and write numbers from 1 to 20 in numerals and words I can use the language of: equal to, more than, less than (fewer), most, least	I can read and write numbers up to 100 in numerals and words I can compare and order numbers from 0 up to 100; use <, > and = signs	I can read and write numbers up to 1000 in numerals and words I can compare and order numbers up to 1000	I can order and compare numbers up to 10000 and up to 2 decimal places	I can read, write, order and compare numbers to at least 100 000 and up to 3 decimal places I can identify common factors of 2 numbers I know prime and square numbers up to 100	
NUMBER Number facts + / - / x / ÷	I can find one more or one less from a group of up to five objects, then ten objects. I can use the language of more or fewer to compare two sets of objects.	I know families of ± facts for each number to 10	I know families of ± facts for each number to 20 **I know my 2, 5, and 10 times tables**	I can derive and use families of ± facts up to 100 I know my 3, 4 and 8 times tables	I can derive and use addition and subtraction facts for decimals to one place I know my times tables up to 12 x 12	I can derive and use addition and subtraction facts for decimals to two places I can use my times tables up to 12 x 12 to work out facts for multiplying multiples of 10	I can use my times tables up to 12 x 12 to work out facts for multiplying decimals

SKILLS	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
NUMBER Mental +/-	I can count objects and relate them to the correct number. I can find the total number of items in two groups by counting all of them.	I can count on or back to ±	I can choose to count on or back, reorder, partition, bridge, adjust or use near doubles to ± mentally	I can choose to count on or back, reorder, partition, bridge, adjust or use near doubles to ± mentally	I can choose to count on or back, reorder, partition, bridge, adjust or use near doubles to ± mentally	I can identify calculations for which I can use an efficient mental method such as counting on or back, reordering, partitioning, bridging, adjusting or using near doubles to ± mentally	**I can identify calculations for which I can use an efficient mental method such as counting on or back, reordering, partitioning, bridging, adjusting or using near doubles to ± mentally**
NUMBER Written +/-	I can begin to represent numbers using fingers, marks on paper, pictures, models and images, sometimes matching numeral and quantity correctly	Use models and images including the number line to ± 1 digit & 2 digit numbers to 20 including 0	**Use models and images including the number line to 23 ± 5 =, 23 ± 20 = 3 + 7 + 4 =, 34 ± 17 =**	I can add and subtract numbers with up to 3 digits using formal methods of ±	I can add and subtract numbers with up to 4 digits using formal methods of ±	I can use formal written methods for calculations such as 87654 ± 4567= 43.8 ± 23.4 =	**I can use formal written methods for calculations such as 10.36 ± 9.285=**

NUMBER Mental x/÷	I can compare two groups of objects saying when they have the same number.	I know doubles and halves for each number to 20	I know doubles and halves for each number to 50	I can use knowledge of doubles and halving to x/÷ (e.g. ½ of 60 is 30 so ¼ is 15) Use knowledge of number facts and place value to multiply and divide	I can ½ or double a up to 200 I can use knowledge of number facts and place value to multiply and divide (e.g. 22x5 (22x10÷2) I can use closely related facts e.g. 13x9, 13x11 I can use partitioning e.g. 32x3=30x3+2x3	I can ½ or double up to 500 I can use knowledge of number facts and place value to multiply and divide (e.g. 36x50-36x100÷2) I can use closely related facts e.g. 13x21 or 13x19 I can use partitioning (e.g. 47x6=40x6+7x6)	**I can ½ or double decimals (e.g. 0.46÷2, double 0.99) I can use knowledge of number facts and place value to multiply and divide (e.g. 39x25=39x100÷4) I can use closely related facts e.g. 13x49, 13x51 I can use partitioning (e.g. 86x7=80x7+6x7)**
NUMBER Written x/÷		I can use models and images to show multiplication facts	I can use a range of models and images including number lines and arrays to show and explain multiplication facts	I can multiply 2 digit numbers by 1 digit numbers	I can multiply and divide 3 digit numbers by 1 digit numbers	I can multiply and divide up to 4 digits by a 1 digit number	**I can multiply and divide up to 4 digit numbers by 2 digit numbers**

The Treehouse School
Nature, nurture and nourishment

	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
NUMBER Contextual +/-/×/÷	I can begin to identifly own mathematical problems based on own interests and fascinations. In practical activities and discussions, begin to use the vocabulary involved in adding and subtracting.	I can solve suitable one-step problems in contexts (including using the bar model), deciding which operations and methods to use and why	I can solve suitable one-step problems in contexts (including using the bar model), deciding which operations and methods to use and why	I can solve suitable one-step problems in contexts (including using the bar model), deciding which operations and methods to use and why	I can solve two-step problems in contexts (including using the bar model), deciding which operations and methods to use and why	I can solve multi-step problems in contexts (including using the bar model), deciding which operations and methods to use and why	**I can solve multi-step problems in contexts (including using the bar model), deciding which operations and methods to use and why**
NUMBER Estimation	Estimate how many object they can see and check by counting them		**I can give a suitable estimate for a calculation**	I can give a suitable estimate for a calculation	I can give a suitable estimate for a calculation	I can give a suitable estimate for a calculation	I can give a suitable estimate for a calculation
SKILLS	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
FDRP Fractions		I can find and describe a half as one of two equal parts of an object, shape or amount	**I can find and describe 1/3, ¼, ¾ as equal parts of an object, shape or amount**	I can find and describe unit fraction as equal parts of shapes (standard and non-standard) or amounts I can compare and order unit fractions	I can find non-unit fractions of shapes (standard and non standard) or amounts	I can compare and order fractions whose denominators are all multiples of the same number	I can use common factors compare and order any fractions

The Treehouse School

The Treehouse Trust Registered Charity Number: 1143560

The Treehouse School
Nature, nurture and nourishment

SKILLS	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
FDRP Calculating			I can add and subtract halves and quarters	I can add and subtract fractions with the same denominator within one whole	I can add and subtract fractions with the same denominator	I can add and subtract fractions with the same denominator and multiples of the same number I can multiply proper fractions and mixed numbers by whole numbers	**I can add and subtract fractions with different denominators and mixed numbers** **I can multiply simple pairs of proper fractions, writing the answer in its simplest form**
FDRP Percentage					I can recognise the % sign and understand that it means number of parts per hundred	I can find 10% of any number	I can find 1% & 10% and use this to find any percentage of a number
FDRP Equivalence			I can recognise the equivalence of 2/4 and ½	I can recognise the equivalence of fractions with small denominators I can recognise decimal equivalents of tenths and hundredths	I can show equivalence of families of common equivalent fractions	I can identify, name and write equivalent fractions including tenths and hundredths	**I can recognise the relationship between fractions, decimals and percentages and can express them as equivalent quantities**

The Treehouse Trust Registered Charity Number: 1143560

MEASURES Comparing	Order 2 or 3 items by length or height. Order 2 items by weight or capacity.	I can use the language of comparison for different measures	I can compare and order measures using >,<,=	I can estimate, compare and calculate different measures, including money I can measure the perimeter to 2D shapes	I can estimate, compare and calculate different measures, including money I can measure the perimeter of rectilinear shapes	I can calculate and compare the area and perimeter of squares and rectangles including rectilinear shapes	**I can calculate, estimate and compare volume of cubes and cuboids** **I can calculate the area of parallelograms and triangles**
MEASURES Time	I can use every day language to relate to time. I can measure short periods of time in simple ways.	Tell the time to the hour and half past the hour	**Tell and write the time to five minutes**	I can estimate and read time with increasing accuracy to the nearest minute	I can read, write and convert time between analogue, digital and 12/24 hour clocks		
MEASURES Recording	I can order and sequence familiar events.	I can measure and begin to record	I can choose the right equipment and use standard units to measure and record				
MEASURES Money	I can begin to use every day language to relate to money	I recognise and know the value of different notes and coins	I recognise and use £ and p	I can ± different amounts of money I can write different amounts of money correctly e.g. £3.05			
MEASURES Conversions			I know minutes in an hour and hours in a day	I know seconds in a minute and days in each month and the year	I can convert between different units of measure (e.g. m to km)	I can convert between different units of measure (e.g. g to kg)	I can convert using decimals up to 3 places

SKILLS	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
SHAPE P, D & M	I can describe relative position such as 'behind' or 'next to'	I can describe half, quarter and three-quarter turns	I can describe half, quarter and three-quarter turns and use clockwise and anti-clockwise	I can identify and plot points on a coordinate grid	I can describe movements between positions using left/right and up/down I can identify the missing coordinates of a polygon	I can describe the position of a shape following a reflection or translation	I can describe positions on the full coordinate grid
SHAPE 2D	I can begin to recognise these shapes as flat and be able to select a particular named shape.	I can recognise common 2D shapes	**I can identify and describe the properties of 2D shapes** I can sort 2D shapes	I can identify and describe the properties 2D shapes I can compare and classify 2D shapes	I can identify and describe the properties of any 2D shapes I can compare and classify any 2D shape including quadrilaterals and triangles		I can draw and translate simple shapes on the coordinate plane, and reflect them in the axes.
SHAPE 3D	I can begin to recognise these shapes as solid and be able to select a particular named shape	I can recognise common 3D shapes	**I can identify and describe the properties of 3D shapes** I can sort 3D shapes			I can identify 3D shapes from 2D representations	I can recognise, describe and build 3D shapes
SHAPE Angles			Identify right angles	Recognise angles as a property of a shape of a description of a turn Identify whether angles are greater or less than a right angle	Identify acute and obtuse angles	I can draw angles and measure them in degrees Find missing lengths and angles in rectangles I know key facts about angles	**Find unknown angles in any triangles, quadrilaterals and polygons**

ALGEBRA Sequenc		I can sequence events in time order	I can compare and sequence intervals of time				I can generate and describe linear number sequences
ALGEBRA Equations		I can solve suitable missing number problems including where the = sign is in different places	**I can use knowledge of inverses to solve suitable missing number problems including where the = sign is in different places**	I can solve suitable missing number problems including where the = sign is in different places	I can solve suitable missing number problems including where the = sign is in different places	I can solve suitable missing number problems including where the = sign is in different places	**I can express missing number problems algebraically** **I can use simple formulae**
DATA Charts			I can interpret and construct pictograms, tally charts, block diagrams and tables	I can interpret and present data using bar charts, pictograms and tables	I can interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	I can complete, read and interpret information in tables, including timetables	I can interpret and construct pie charts and line graphs and use these to solve problems
DATA Reading scales			**I can read scales in divisions of ones, twos, fives and tens**				
DATA Contextual			I can answer questions about data	I can solve one and two step questions about data I can answer big questions using my data handling skills	I can solve one and two step questions about data I can answer big questions using my data handling skills	I can solve one and two step questions about data I can answer big questions using my data handling skills	I can solve one and two step questions about data I can answer big questions using my data handling skills

The Treehouse School

Nature, nurture and nourishment