



Ark Blacklands Primary Academy Mathematics Curriculum



Subject Aims

Maths at Ark Blacklands has problem solving at its core. Our Mastery approach ensures that every child, in every maths lesson, is both challenged and supported in order to develop their mathematical thinking and resilience. **Our Maths curriculum ensures that children are active participants in the learning process;** they are challenged to think, question, reflect and discuss.

Curriculum Approach

In Maths teaching, we aim to equip pupils with tools such as logical reasoning, problem solving skills and the ability to think in abstract ways. Instead of learning mathematical procedures by rote, we teach pupils to build a deep understanding of concepts, which will enable them to apply their learning in different situations. Mathematics is taught through practical and written activities that have real meaning for the children, enabling them to develop their numerical skills and the ability to solve problems. In order to support teachers and pupils in achieving our aims, we balance the statutory requirements of the National Curriculum with the mastery approach prompted by the Mathematics Mastery Programme.

By following the curriculum design of Mathematics Mastery, we approach problem solving using the Dimensions of Depth:

Conceptual Understanding – Creating connections between concepts and allowing pupils to represent mathematical concepts in many ways using the **concrete-pictorial-abstract (CPA) approach**, where **concrete** is the doing (using manipulatives such as dienes, tens frames and place value counters), **pictorial** is the seeing (drawing a diagram or picture of a problem, or drawing objects to help solve it) and **abstract** is using the symbols (representing a problem using mathematical notation).

Language and Communication – Pupils actively participate in every lesson and strong emphasis is placed on vocabulary and the use of full sentences. Language is a form of communication but supports making stronger links between representations and concepts. In all Maths lessons at Blacklands, a strong emphasis is placed on **collaborative learning**, where pupils work together to explain, describe and explore different mathematical concepts using precise vocabulary.

Mathematical Thinking – Promoting an ethos within the classroom that all pupils think mathematically. Through different forms of questioning, pupils extend their understanding beyond that of procedural Maths and reason with the concepts.

Throughout the academy, we teach the following areas of study:

- using and applying maths in different contexts;
- number and algebra;
- shape, space and measure;
- data handling.

In addition to a daily maths lesson, children take part in regular Maths Meetings where pupils consolidate and develop fluency in all areas of maths. Here, we place a **strong emphasis on arithmetic**, developing mental recall of number facts before introducing written calculations for the four operations.

The Science, Design Technology and PE curriculums also offer opportunities for children to use and apply their mathematical problem-solving skills and knowledge in practical, real-life situations.

Mathematics Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Reception	Early mathematical experiences Pattern and early number	Numbers within 6 Addition and subtraction within 6 Measures Shapes and sorting	Numbers within 10 Calendar and time Addition and subtraction within 10 Grouping and sharing	Number patterns within 15 Doubling and halving Shape and pattern	Securing addition and subtraction facts Number patterns within 20 Number patterns beyond 20 Money	Measures Exploration of patterns within number
Year 1	Numbers to 10 Addition and subtraction within 10	Shapes and patterns Numbers to 20 Addition and subtraction within 20	Time Calculation strategies within 20 Numbers to 50	Adding and subtracting within 20 Fractions: Quarter and Half Measures: Length and mass	Numbers from 50 to 100 and beyond Adding and subtracting within 100 Money	Multiplication and division Measures: Capacity and volume
Year 2	Number within 100 Addition and subtraction 2-digit numbers Addition and subtraction word problems	Measures: Length Graphs Multiplication and division: 2, 5 and 10	Time Fractions Addition and subtraction of 2-digit numbers	Money Face, shapes and patterns: lines and turns	Number within 1000 Measures: Capacity and volume Measures: Mass	Exploring calculation strategies Multiplication and division: 3x 4x
Year 3	Number sense and reasoning within 100 Place value Graphs	Addition and subtraction with up to three digits Length and perimeter	Multiplication and division Deriving multiplication and division facts	Time: Analogue, digital and measuring time Fractions	Angles and shapes Measures: Mass and volume	Securing multiplication and division: 6x and 8x Exploring calculation strategies and place value
Year 4	Reasoning with four-digit numbers Addition and subtraction	Multiplication and division Discrete and continuous data	Securing multiplication facts Fractions Time	Decimals Area and perimeter	Solving measure and money problems Shape and symmetry	Position and direction Reasoning with patterns and sequences 3D Shape
Year 5	Reasoning with large whole integers: Up to one million Integer addition and subtraction Line graphs and timetables	Multiplication and division Area and perimeter	Fractions and decimals Angles	Fractions and percentages Transformations	Converting units of measure Calculating with whole numbers and decimals	2-D and 3-D shapes Volume Problem solving
Year 6	Number and Place value Multiplication and division	Fractions Coordinates and shape	Angles and Lengths Decimals and Measures	Percentage and Statistics Proportion Algebra	Reasoning in Maths Investigations	Multicultural multiplication Surveys and investigations

Arithmetic Common Teaching Order

This common teaching order of the arithmetic curriculum has been devised for Years 2 -5 to align with the new cumulative arithmetic assessments. For years 2-4, all arithmetic content will have been covered by the end of Spring term; the last term will therefore offer an opportunity to revisit arithmetic skills. In year 5, all arithmetic content will have been covered by the end of Summer 1; the last half term will therefore offer an opportunity to revisit arithmetic skills. Items in blue indicate topics from the previous year for revision. Teachers should recap previous years' skills before moving on to new content.

	Autumn 1	Autumn 2	Spring 1	Spring 2
Year 2	<p>Addition</p> <p>1a) Count forwards across 100 from any given number</p> <p>1b) Add 1-digit and 2-digit numbers to 20</p> <p>2a) Add a 2-digit and 1-digit number (up to 100)</p> <p>2b) Add a 2-digit number and tens (up to 100)</p> <p>2c) Add three 1-digit numbers (up to 100)</p> <p>Subtraction</p> <p>1c) Count backwards across 100 from any given number</p> <p>1d) Subtract 1-digit and 2-digit numbers to 20</p> <p>2d) Subtract a 2-digit and 1-digit number (up to 100)</p> <p>2e) Subtract a 2-digit number and tens (up to 100)</p> <p>Fractions</p> <p>1e) Find half of a quantity</p> <p>1f) Find quarter of a quantity</p>	<p>Addition</p> <p>2f) Add two 2-digit numbers (up to 100 no regrouping)</p> <p>2g) Solve addition missing number problems (up to 100 no regrouping)</p> <p>Subtraction</p> <p>2h) Subtract two 2-digit numbers (up to 100 no regrouping)</p> <p>2i) Solve subtraction missing number problems (up to 100 no regrouping)</p> <p>Fractions</p> <p>2j) Use multiplication facts for the 2, 5 and 10 multiplication tables</p>	<p>Division</p> <p>2k) Use division facts for the 2, 5 and 10 multiplication tables</p> <p>Fractions</p> <p>1e) Find half of a quantity</p> <p>1f) Find quarter of a quantity</p> <p>2l) Find one third of a quantity</p> <p>2m) Find two quarters of a quantity</p> <p>2n) Find three quarters of a quantity</p>	<p>Addition</p> <p>2o) Add two 2-digit numbers with regrouping</p> <p>2p) Solve addition missing number problems (up to 100 with regrouping)</p> <p>Subtraction</p> <p>2q) Subtract two 2-digit numbers with regrouping</p> <p>2r) Solve subtraction missing number problems (up to 100 with regrouping)</p>
Year 3	<p>Addition</p> <p>2a) Add a 2-digit and 1-digit number (up to 100)</p> <p>2b) Add a 2-digit number and tens (up to 100)</p> <p>2c) Add three 1-digit numbers</p> <p>3a) Apply knowledge of partitioning with numbers up to 999</p> <p>3b) Add a 3-digit number and ones (up to 999)</p> <p>3c) Add a 3-digit number and tens (up to 999)</p> <p>3d) Add a 3-digit number and hundreds (up to 999)</p> <p>Subtraction</p>	<p>Addition</p> <p>2f) Add two 2-digit numbers (up to 100 – no regrouping)</p> <p>2g) Solve addition missing number problems (up to 100 – no regrouping)</p> <p>2o) Add two 2-digit numbers - with regrouping</p> <p>2p) Solve addition missing number problems (up to 100 – with regrouping)</p> <p>3i) Add numbers up to 3-digits using formal method of column addition</p> <p>3j) Solve addition missing number problems (up to 999 – with regrouping)</p>	<p>Multiplication</p> <p>2j) Use multiplication facts for the 2, 5 and 10 multiplication tables</p> <p>3m) Multiply a 2-digit by a 1-digit number (2, 3, 4, 5 and 8)</p> <p>3n) Multiply more than two numbers together (2, 3, 4, 5, 8 and 10)</p> <p>3o) Solve multiplication missing number problems (2, 3, 4, 5, 8 and 10)</p> <p>Division</p> <p>2k) Use division facts for the 2, 5 and 10 multiplication tables</p>	<p>Fractions</p> <p>2l) Find one third of a quantity</p> <p>2m) Find two quarters of a quantity</p> <p>2n) Find three quarters of a quantity</p> <p>3r) Add fractions with the same denominator within one whole</p> <p>3s) Subtract fractions with the same denominator within one whole</p> <p>3t) Find fractions of quantities (up to 100) where the denominator is 2, 3, 4, 5, 8 or 10</p>

	<p>2d) Subtract a 2-digit and one-digit number (up to 100)</p> <p>2e) Subtract a 2-digit and tens (up to 100)</p> <p>3e) Subtract multiples of 10 or 100 from a number (up to 999) – including regrouping / bridging</p> <p>3f) Subtract a 3-digit number and ones (up to 999)</p> <p>3g) Subtract a 3-digit number and tens (up to 999)</p> <p>3h) Subtract a 3-digit number and hundreds (up to 999)</p>	<p>Subtraction</p> <p>2h) Subtract two 2-digit numbers (up to 100 – no regrouping)</p> <p>2i) Solve subtraction missing number problems (up to 100 – no regrouping)</p> <p>2q) Subtract two 2-digit number with regrouping</p> <p>2r) Solve subtraction missing number problems (up to 100 – with regrouping)</p> <p>3k) Subtract numbers up to 3-digits using formal method of column subtraction</p> <p>3l) Solve subtraction missing number problems (up to 999 – with regrouping)</p>	<p>3p) Use known multiplication facts to create associated division facts (2, 3, 4, 5, 8 and 10)</p> <p>3q) Solve division missing number problems (2, 3, 4, 5, 8 and 10)</p>	
Year 4	<p>Addition</p> <p>3a) Apply knowledge of partitioning with numbers up to 999</p> <p>3b) Add a 3-digit number and ones (up to 999)</p> <p>3c) Add a 3-digit number and tens (up to 999)</p> <p>3d) Add a 3-digit number and hundreds (up to 999)</p> <p>3i) Add numbers up to 3-digits using formal method of column addition</p> <p>3j) Solve addition missing number problems (up to 999 with regrouping)</p> <p>4a) Apply knowledge of partitioning with numbers up to 9,999</p> <p>4b) Add multiples of 1, 10, 100 and 1,000 to a number (up to 9,999)</p> <p>4c) Add numbers up to 4-digits using formal method of column addition</p> <p>4d) Solve addition missing number problems (up to 9,999 with regrouping)</p> <p>Subtraction</p> <p>3e) Subtract multiples of 10 or 100 from a number (up to 999) – including regrouping / bridging</p> <p>3f) Subtract a 3-digit number and ones (up to 999)</p> <p>3g) Subtract a 3-digit number and tens (up to 999)</p>	<p>Multiplication</p> <p>3m) Multiply a 2-digit by a 1-digit number (2, 3, 4, 5 and 8)</p> <p>3n) Multiply more than two numbers together (2, 3, 4, 5, 8 and 10)</p> <p>3o) Solve multiplication missing number problems (2, 3, 4, 5, 8 and 10)</p> <p>4h) Use place value, known and derived facts to multiply (e.g. 4000×5)</p> <p>4i) Multiply a number by 0 and 1</p> <p>4j) Multiply 2- and 3-digit numbers by a 1-digit number using a formal written method</p> <p>4k) Multiply together three numbers (all times tables)</p> <p>Division</p> <p>3p) Use known multiplication facts to create associated division facts (2, 3, 4, 5, 8 and 10)</p> <p>3q) Solve division missing number problems (2, 3, 4, 5, 8 and 10)</p> <p>4l) Use place value, known and derived facts to multiply (e.g. $1400 \div 7$)</p> <p>4m) Use known multiplication facts to create associated division facts (all times tables), knowledge of inverse</p> <p>4n) Divide a number by 0, 1 and itself</p>	<p>Fractions</p> <p>3r) Add fractions with the same denominator within one whole</p> <p>3s) Subtract fractions with the same denominator within one whole</p> <p>3t) Find fractions of quantities (up to 100) where the denominator is 2, 3, 4, 5, 8 or 10</p> <p>4o) Add fractions with the same denominator where the answer may be an improper fraction</p> <p>4p) Subtract fractions with the same denominator where the answer may be an improper fraction</p> <p>4q) Find fractions of quantities using known multiplication facts</p>	<p>Addition</p> <p>4r) Add using up to two decimal places (to either a whole number or where numbers have the same number of decimal places)</p> <p>Subtraction</p> <p>4s) Subtract using up to two decimal places (from either a whole number or where numbers have the same number of decimal places)</p> <p>Multiplication</p> <p>4t) Multiply one- or two-digit numbers by 10 and 100 where the answer is no greater than 10,000 (answers to be whole numbers only)</p> <p>Division</p> <p>4u) Divide one- or two-digit numbers by 10 and 100 (answers to include up to 2 decimal places)</p>

	<p>3h) Subtract a 3-digit number and hundreds (up to 999)</p> <p>3k) Subtract numbers up to 3-digits using formal method of column subtraction</p> <p>3l) Solve subtraction missing number problems (up to 999 with regrouping)</p> <p>4e) Subtract multiples of 1, 10, 100 and 1,000 from a number (up to 9,999)</p> <p>4f) Subtract numbers up to 4-digits using formal method of column subtraction</p> <p>4g) Solve subtraction missing number problems (up to 9,999 with regrouping)</p>			
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	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1
Year 5	<p>Addition</p> <p>4a) Apply knowledge of partitioning with numbers up to 9,999</p> <p>4b) Add multiples of 1, 10, 100 and 1,000 to a number (up to 9,999)</p> <p>4c) Add numbers up to 4-digits using formal method of column addition</p> <p>4d) Solve addition missing number problems (up to 9,999 – with regrouping)</p> <p>5a) Add multiples of 10, 100, 1,000, 10,000 and 100,000 to a number (up to 999,999)</p> <p>5b) Add numbers with more than 4- digits using formal method of column addition</p> <p>5c) Apply knowledge of partitioning with numbers up to 1,000,000</p> <p>5d) Solve addition missing number problems (up to 999,999 – with regrouping)</p> <p>Subtraction</p> <p>4e) Subtract multiples of 1, 10, 100 and 1,000 from a number (up to 9,999)</p> <p>4f) Subtract numbers up to 4-digits using formal method of column subtraction</p> <p>4g) Solve subtraction missing number problems (up to 9,999 – with regrouping)</p> <p>5e) Subtract multiples of 10, 100, 1,000, 10,000 and 100,000 from a number (up to 999,999)</p> <p>5f) Subtract numbers with more than 4- digits using formal method of column subtraction</p> <p>5g) Solve subtraction missing number problems (up to 999,999 – with regrouping)</p>	<p>Multiplication</p> <p>4h) Use place value, known and derived facts to multiply (e.g. 4000×5)</p> <p>4i) Multiply a number by 0 and 1</p> <p>4j) Multiply 2- and 3-digit numbers by a 1- digit number using a formal written method</p> <p>4k) Multiply together three numbers (all times tables)</p> <p>5h) (i) Multiply numbers up to 4-digits by a 1-digit or (ii) 2-digit number</p> <p>5i) Multiply whole numbers by 10, 100 and 1,000 (where the answer is no greater than 999,999)</p> <p>5j) Multiply multiples of 10 by further multiples of 10 drawing upon known facts (e.g. 30×400)</p> <p>5k) Solve problems using square and cube numbers</p> <p>Division</p> <p>4l) Use place value, known and derived facts to divide (e.g. $1400 \div 7$)</p> <p>4m) Use known multiplication facts to create associated division facts (all times tables), knowledge of inverse</p> <p>4n) Divide a number by 0 and 1</p> <p>5l) Divide numbers up to 4-digits by a 1-digit number using the formal written method of long division (recording a remainder where required)</p> <p>5m) Divide whole numbers by 10, 100 and 1,000 (where the answer is a whole number)</p> <p>5n) Divide multiples of 10 by further multiples of 10 drawing upon known facts (e.g. $3200 \div 40$)</p>	<p>Fractions</p> <p>4o) Add fractions with the same denominator where the answer may be an improper fraction</p> <p>4p) Subtract fractions with the same denominator where the answer may be an improper fraction</p> <p>4q) Find fractions of quantities using known multiplication facts</p> <p>5o) Find fractions of quantities using formal calculation strategies</p> <p>Addition</p> <p>4r) Add using up to two decimal places (to either a whole number or where numbers have the same number of decimal places)</p> <p>5p) Add decimals up to 3 d.p. (where two numbers have a different number of decimal places e.g. $14.7 + 8.655$)</p> <p>Subtraction</p> <p>4s) Subtract using up to two decimal places (from either a whole number or where numbers have the same number of decimal places)</p> <p>5q) Subtract decimals up to 3 d.p. (where two numbers have a different number of decimal places e.g. $14.7 - 8.657$)</p>	<p>Fractions</p> <p>5r) Add fractions where there are different denominators, and one fraction is a multiple of the other</p> <p>5s) Subtract fractions where there are different denominators, and one fraction is a multiple of the other</p> <p>5t) Multiply proper fractions by whole numbers</p> <p>5u) Multiply mixed numbers by whole numbers</p> <p>Percentages</p> <p>5v) Find 10% of a number</p> <p>5w) Find a multiple of 10% of a number</p> <p>5x) Find 5% of a number</p>	<p>Multiplication</p> <p>4t) Multiply one- or two- digit numbers by 10 and 100 where the answer is no greater than 10,000 (answers to be whole numbers only)</p> <p>5y) Multiply whole number and decimal numbers by 10, 100 and 1,000 where the quotient may be have three decimal places</p> <p>Division</p> <p>4u) Divide one- or two- digit numbers by 10 and 100 (answers to include up to 2 decimal places)</p> <p>5z) Divide whole numbers and decimals by 10, 100 and 1,000 (where the quotient contains a decimal, and the dividend may contain a decimal)</p>

As there are no assessments in year 1, the content can be taught in any order. The year 6 curriculum has also been left to allow for teachers to cater to their pupils and teach in a sequence that works for them.

	Addition	Subtraction	Multiplication	Division	Fractions	Percentages
Year 1	1a) Count forwards across 100 from any given number 1b) Add one digit and two-digit numbers to 20	1c) Count backwards across 100 from any given number 1d) Subtract one digit and two-digit numbers to 20			1e) Find half of a quantity 1f) Find quarter of a quantity	
Year 6	6a) Add multiples of 10, 100, 1,000, 10,000, 100,000 and 1,000,000 to a number (up to 9,999,999) 6b) Add and subtract using negative numbers through zero 6c) Use BIDMAS to identify the correct order of operations	6d) Subtract multiples of 10, 100, 1,000, 10,000, 100,000 and 1,000,000 from a number up to 9,999,999	6e) Multiply a 4-digit number by a 2-digit number using the formal method of multiplication 6f) Multiply one-digit numbers with up to two decimal places by whole numbers 6g) Multiply a tenths number that is less than one by a multiple of 10 or 100 (e.g. 0.4×60) 6h) Multiply a number with decimals by a two-digit number using the formal method of long multiplication (e.g. 5.1×28)	6i) Divide numbers up to 4 digits by a 2-digit number using the formal written method of long division (where there may be a remainder) 6j) Divide numbers up to 4 digits by a 1-digit number using the formal written method of short division (where there may be a remainder)	6k) Add and subtract fractions with different denominators (using two or three fractions) 6l) Add and subtract a mixed number to a fraction, where the denominators are the same and different 6m) Add and subtract two mixed numbers, where the denominators and the same and different 6n) Multiply pairs of proper fractions 6o) Divide proper fractions by whole numbers	6p) Find a multiple of 5% of a number 6q) Find 1% of a number 6r) Find a multiple of 1% of a number

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