Warren Academy
A L.E.A.D. Academy

Mathematics progression of concepts – Year 1 multiplication and division

In F2, I have learnt…

Number bonds
- to explore and represent even and odd numbers
- to explore and represent doubles
- to explore and represent how quantities can be shared equally

Representations and manipulatives

In year 1, I am learning…

Multiplication and division facts
- to count in multiples of twos, fives and tens

Problem solving
- to solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher

In year 2, I will learn…

Multiplication and division facts
-to count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward
-to recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers

Mental calculation
-to show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot

Written calculation
-to calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs

Problem solving
-to solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in

In my future I can…

Across the curriculum

-science – understanding data
-DT – taking measurements
-PE – keeping score, measuring, angles
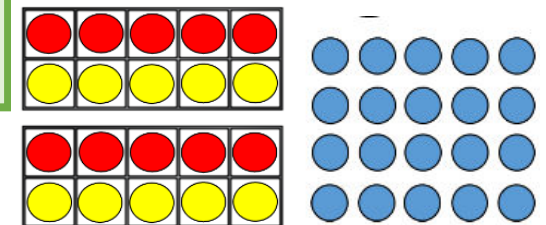-geography – coordinates, maps
-computing – databases, coding

Life skills
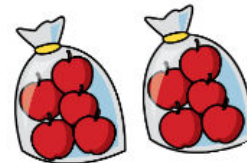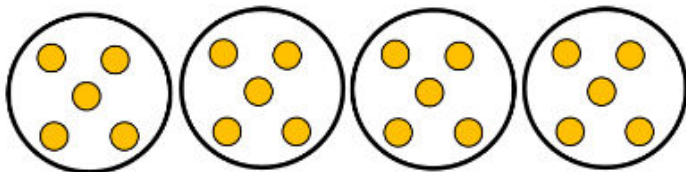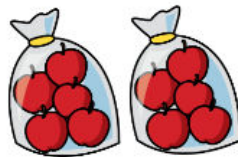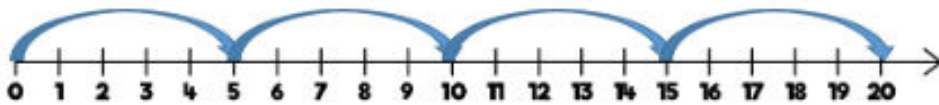
-shopping and budgeting
-critical thinking
-playing sport
-map reading
-interpreting statistics
-working with computers

Careers

-shop worker
-bank cashier
-architect
-doctor
-nurse
-teacher
-computer programmer

$$5 + 5 + 5 + 5 = 20$$

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Mathematics progression of concepts – Year 2 multiplication and division
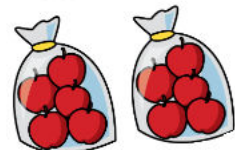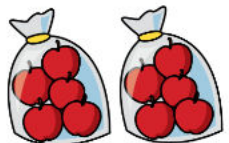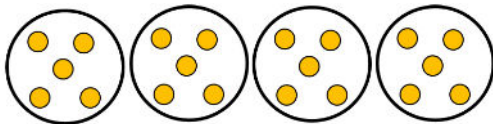
In year 1, I have learnt…

Multiplication and division facts
- to count in multiples of twos, fives and tens

Problem solving
- to solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher

Representations and manipulatives

In year 2, I am learning…

Multiplication and division facts
-to count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward

Mental calculation
-to show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot

Written calculation
-to calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs

Problem solving
-to solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

$$4 \times 5 = 20$$
$$5 \times 4 = 20$$

In year 3, I will learn…

Multiplication and division facts
-to count from 0 in multiples of 4, 8, 50 and 100
-to recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables

Mental calculation
-to write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one digit numbers, using mental and progressing to formal written

Written calculation
-to write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods

Problem solving
- solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects

In my future I can…

Across the curriculum

-science – understanding data
-DT – taking measurements
-PE – keeping score, measuring, angles
-geography – coordinates, maps
-computing – databases, coding

Life skills

-shopping and budgeting
-critical thinking
-playing sport
-map reading
-interpreting statistics
-working with computers

Careers

-shop worker
-bank cashier
-architect
-doctor
-nurse
-teacher
-computer programmer

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Mathematics progression of concepts – Year 3 multiplication and division

In year 2, I have learnt…

Multiplication and division facts
-to count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward

Mental calculation
-to show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
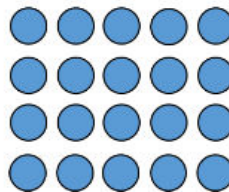
Written calculation
-to calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs

Problem solving
-to solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

Representations and manipulatives

In year 3, I am learning…

Multiplication and division facts
-to count from 0 in multiples of 4, 8, 50 and 100
-to recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables

Mental calculation
-to write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one digit numbers, using mental and progressing to formal written

Written calculation
-to write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods

Problem solving
- solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects

In year 4, I will learn…

Multiplication and division facts
- to count in multiples of 6, 7, 9, 25 and 1 000
-to recall multiplication and division facts for multiplication tables up to 12 × 12

Mental calculation
-to use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers
-to recognise and use factor pairs and commutativity in mental calculations

Written calculation
- to multiply two-digit and three-digit numbers by a one digit number using formal written layout

Properties of number
- recognise and use factor pairs and commutativity in mental calculations

Inverse, estimating and checking
- to estimate and use inverse operations to check answers to a calculation

Problem solving
- to solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why

In my future I can…
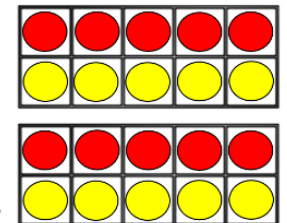
Across the curriculum

-science – understanding data
-DT – taking measurements
-PE – keeping score, measuring, angles
-geography – coordinates, maps
-computing – databases, coding

Life skills

-shopping and budgeting
-critical thinking
-playing sport
-map reading
-interpreting statistics
-working with computers

Careers

-shop worker
-bank cashier
-architect
-doctor
-nurse
-teacher
-computer programmer

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Mathematics progression of concepts – Year 4 multiplication and division

In year 3, I have learnt…

Multiplication and division facts
-to count from 0 in multiples of 4, 8, 50 and 100
-to recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables

Mental calculation
-to write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one digit numbers, using mental and progressing to formal written

Written calculation
-to write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods

Problem solving
- solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects

In year 4, I am learning…

Multiplication and division facts
- to count in multiples of 6, 7, 9, 25 and 1 000
-to recall multiplication and division facts for multiplication tables up to 12 × 12

Mental calculation
-to use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers
-to recognise and use factor pairs and commutativity in mental calculations

Written calculation
- to multiply two-digit and three-digit numbers by a one digit number using formal written layout

Properties of number
- recognise and use factor pairs and commutativity in mental calculations

Inverse, estimating and checking
- to estimate and use inverse operations to check answers to a calculation

Problem solving
- to solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why

In year 5, I will learn…

Multiplication and division facts
-to count forwards or backwards in steps of powers of 10 for any number up to 1 000 000

Mental calculation
-to multiply and divide numbers mentally drawing upon known facts
-to multiply and divide whole numbers and those involving decimals by 10, 100 and 1000

Written calculation
-to multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
-to divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context

Properties of number
-to identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.
-to know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers
-to establish whether a number up to 100 is prime and recall prime numbers up to 19
-to recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)

Problem solving
-solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes

In my future I can…
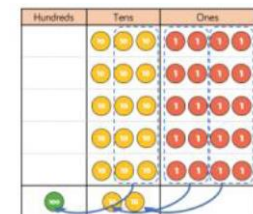
Across the curriculum
-science – understanding data
-DT – taking measurements
-PE – keeping score, measuring, angles
-geography – coordinates, maps
-computing – databases, coding

Life skills
-shopping and budgeting
-critical thinking
-playing sport
-map reading
-interpreting statistics
-working with computers

Careers
-shop worker
-bank cashier
-architect
-doctor
-nurse
-teacher
-computer programmer

Representations and manipulatives

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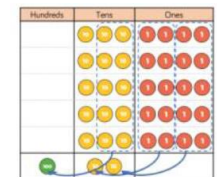
Mathematics progression of concepts – Year 5 multiplication and division

Key vocabulary:

Odd even lots of groups of multiple times multiply repeated addition double halve share group array divide equal groups of rows column inverse fact families multiplication tab le multiplication/division fact product factor remainder derive scaling correspondence prime number composite number square cube prime factor divisibility

In year 4, I have learnt…

Multiplication and division facts
- to count in multiples of 6, 7, 9, 25 and 1 000
- to recall multiplication and division facts for multiplication tables up to 12 × 12

Mental calculation
- to use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1;

Written calculation
- to multiply two-digit and three-digit numbers by a one digit number using formal written layout

Properties of number
- recognise and use factor pairs and commutativity in mental calculations

Inverse, estimating and checking
- to estimate and use inverse operations to check answers to a calculation

Problem solving
- to solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why

	Th	H	T	O
	1	8	2	6
×				3
	5	4	7	8
	2		1	

In year 5, I am learning…

Multiplication and division facts
- to count forwards or backwards in steps of powers of 10 for any number up to 1 000 000

Mental calculation
- to multiply and divide numbers mentally drawing upon known facts
- to multiply and divide whole numbers and those involving decimals by 10, 100 and 1000

Written calculation
- to multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
- to divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context

Properties of number
- to identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.
- to know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers
- to establish whether a number up to 100 is prime and recall prime numbers up to 19
- to recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)

Problem solving
- to solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes

In year 6, I will learn…

Mental calculation
- to perform mental calculations, including with mixed operations and large numbers
- to associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3 /8)

Written calculation
- to multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- to divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context

Properties of number
- to identify common factors, common multiples and prime numbers

Inverse, estimating and checking
- to use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy

Problem solving
- to solve problems involving addition, subtraction, multiplication and division

In my future I can…

Across the curriculum
- science – understanding data
- DT – taking measurements
- PE – keeping score, measuring, angles
- geography – coordinates, maps
- computing – databases, coding

Life skills
- shopping and budgeting
- critical thinking
- playing sport
- map reading
- interpreting statistics
- working with computers

Careers
- shop worker
- bank cashier
- architect
- doctor
- nurse
- teacher
- computer programmer

Representations and manipulatives

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Mathematics progression of concepts – Year 6 multiplication and division

In year 5, I have learnt…

Multiplication and division facts
-to count forwards or backwards in steps of powers of 10 for any number up to 1 000 000

Mental calculation
-to multiply and divide numbers mentally drawing upon known facts
-to multiply and divide whole numbers and those involving decimals by 10, 100 and 1000

Written calculation
-to multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
-to divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context

Properties of number
-to identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.
-to know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers
-to establish whether a number up to 100 is prime and recall prime numbers up to 19
-to recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)

In year 6, I am learning…

Mental calculation
-to perform mental calculations, including with mixed operations and large numbers
-to associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3 /8)

Written calculation
-to multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
-to divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context

Properties of number
- to identify common factors, common multiples and prime numbers

Inverse, estimating and checking
- to use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy

Problem solving
- to solve problems involving addition, subtraction, multiplication and division

In KS3, I will learn…

-to use the concepts and vocabulary of prime numbers, factors, multiples, common multiples, highest common factor, lowest common multipleand prime factorization
-to use multiplication and division both as written and mental methods, applied to integers, decimals, proper and improper fractions and mixed numbers
-to use integer powers are associated roots

Representations and manipulatives

TTh	Th	H	T	O
	2	7	3	9
×			2	8
2₂	1₅	9₃	1₇	2
5₁	4	7₁	8	0
7	6	6	9	2

1

In my future I can…

Across the curriculum

-science – understanding data
-DT – taking measurements
-PE – keeping score, measuring, angles
-geography – coordinates, maps
-computing – databases, coding

Life skills

-shopping and budgeting
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