

Mathematics progression of concepts – year 1 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

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

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 (\times), division (\div) 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

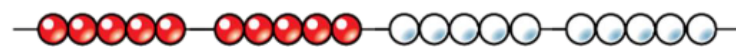
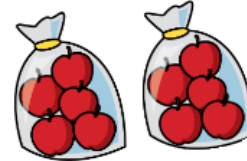
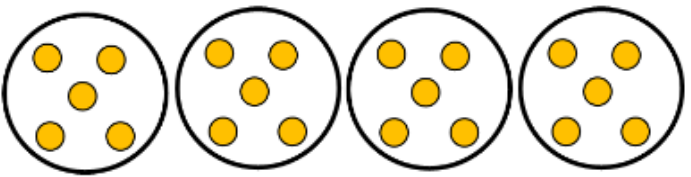
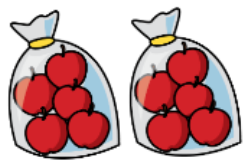
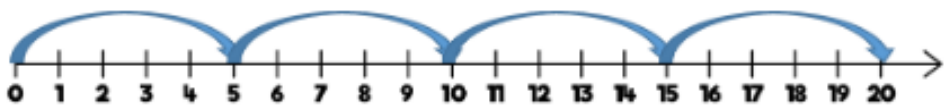
In my future I can...

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

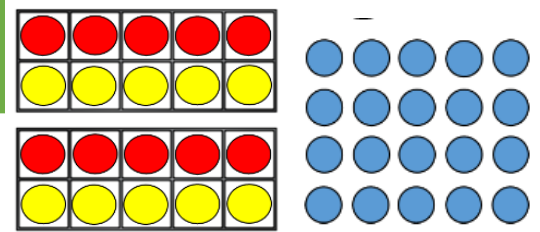
- Life skills**
- shopping and budgeting
 - critical thinking
 - playing sport
 - map reading
 - interpreting statistics
 - working with computers

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

Representations and manipulatives



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



Mathematics progression of concepts – year 2 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 table multiplication/division fact

In year 1, I have learnt...

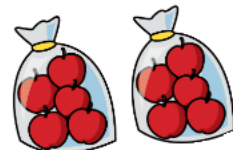
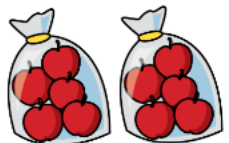
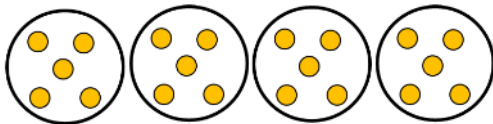
Multiplication and division facts

- 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

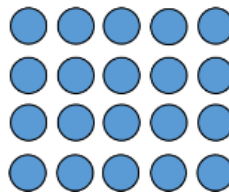
-to calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs

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

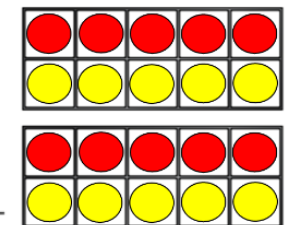
-science – understanding data
-DT – taking measurements
-PE – keeping score, measuring, angles
-geography – coordinates, maps
-computing – databases, coding

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



Mathematics progression of concepts – year 3 multiplication and division

Key vocabulary:

Odd even lots of groups of multiple times multiply
repeated addition double half share group array divide
equal groups of rows column inverse fact families
multiplication table multiplication/division fact product factor

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 (\times), division (\div) 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

	H	T	O	
		3	4	
\times			5	
	1	7	0	
	1	2		

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 1000
-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



Mathematics progression of concepts – year 4 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 table multiplication/division fact product factor remainder derive scaling correspondence

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

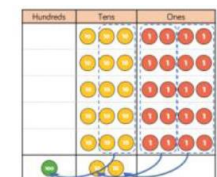
- shopping and budgeting
- critical thinking
- playing sport
- map reading
- interpreting statistics
- working with computers

Careers

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

Representations and manipulatives

	H	T	O	
		3	4	
x			5	
	1	7	0	
	1	2		



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 table 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
x				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 (2^2) and cubed (3^3)

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. $\frac{3}{8}$)

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

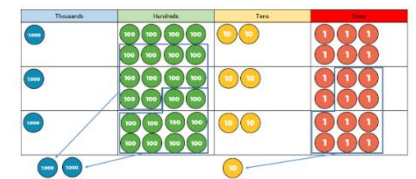
Life skills

- 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



Mathematics progression of concepts – year 6 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 table multiplication/division fact product factor remainder derive scaling correspondence prime number composite number square cube prime factor divisibility factorise

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. $\frac{3}{8}$)

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,

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 multiple and 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 as associated roots

Representations and manipulatives

T	Th	H	T	O
	2	7	3	9
×			2	8
2	1	9	1	2
2	5	3	7	
5	4	7	8	0
1		1		
7	6	6	9	2

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



