



# 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

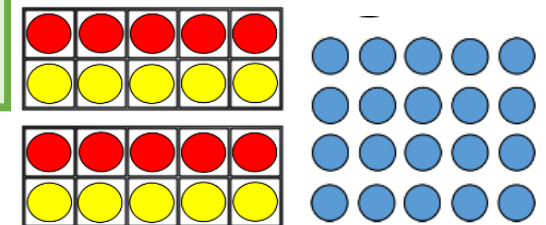
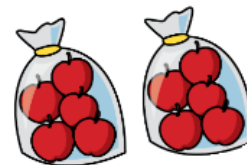
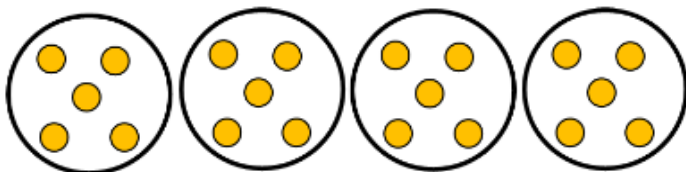
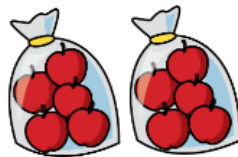
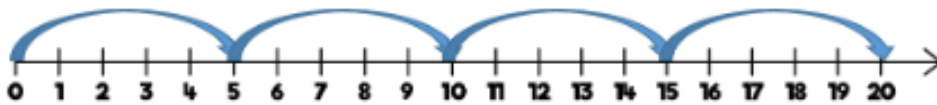
### Life skills

- 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...

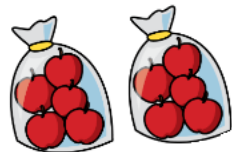
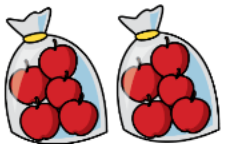
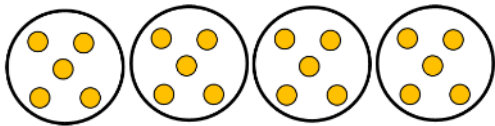
### Multiplication and division facts

- 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

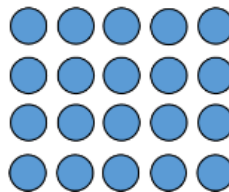
-to calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication ( $\times$ ), division ( $\div$ ) and equals (=) signs

### 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

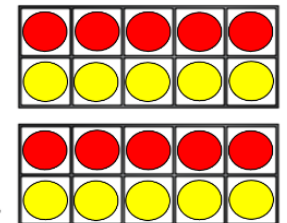
-science – understanding data  
-DT – taking measurements  
-PE – keeping score, measuring, angles  
-geography – coordinates, maps  
-computing – databases, coding

### 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 repeated multiplication multiplication table  
 even groups of multiplication/division  
 lots of double share multiplication fact  
 groups of multiple array divide  
 times repeated addition equal groups of rows column inverse fact families  
 multiply multiply divide  
 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  $12 \times 12$

**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**

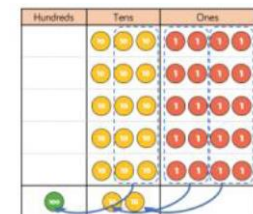
-science – understanding data  
 -DT – taking measurements  
 -PE – keeping score, measuring, angles  
 -geography – coordinates, maps  
 -computing – databases, coding

**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  $12 \times 12$

**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**

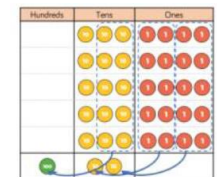
- shopping and budgeting
- critical thinking
- playing sport
- map reading
- interpreting statistics
- working with computers

**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  $12 \times 12$

#### 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

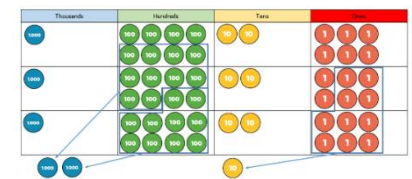
#### Life skills

- 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. 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 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**

TTh	Th	H	T	O
	2	7	3	9
x			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



