**Previously, I have learnt...** → **In Year 1, I am learning...** → **In Year 2, I will learn...** → **My future...**

### Previously, I have learnt...
- To explore and represent even and odd numbers
- To explore and represent doubles
- To explore and represent how quantities can be shared equally
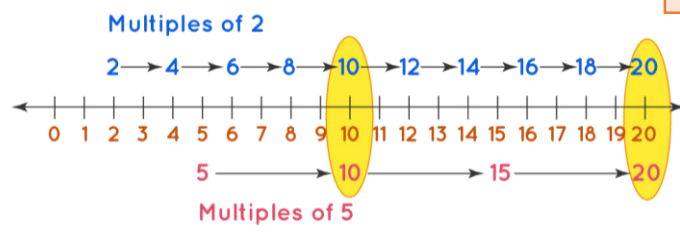
### In Year 1, I am learning...

**x and ÷ facts**
- To count in multiples of 2, 5 and 10

**Problem solving**
- To solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays

### In Year 2, I will learn...

**Counting**
- To count in steps of 2, 3, and 5 from zero
- To count in tens from any number, forwards or backwards

**Reading and writing numbers**
- To read and write numbers to at least 100 in numerals and words

**Comparing numbers**
- To compare and order numbers from 0 up to 100
- To use the signs: <, > and =

**Understanding place value**
- To recognise the place value of each digit in a two-digit number (tens and ones)

**Identifying, representing and estimating numbers**
- To identify, represent and estimate numbers using objects and pictorial representations including the number line

### My future...

**In other subjects**
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

**Jobs**
Shop worker
Bank cashier
Architect
Doctor
Nurse
Teacher
Computer programmer
and many more!

**Multiples of 2**
2 → 4 → 6 → 8 → 10 → 12 → 14 → 16 → 18 → 20

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

5 → 10 → 15 → 20
**Multiples of 5**

3 + 3 + 3 + 3 = 12

$3 \times 4 = 12$

5 + 5 + 5 = 15
or
$5 \times 3 = 15$

### Vocabulary

| | | |
|---|---|---|
| odd, even | multiply | equal groups of |
| How many times...? | repeated addition | array |
| lots of | double | divide |
| groups of | halve | left over |
| multiple | share equally | |
| times | group | |

Alan Turing

# Windmill L.E.A.D Academy
## Lead · Empower · Achieve · Drive

## Mathematics: Year 2
## Multiplication and Division

Previously, I have learnt... → In Year 2, I am learning... → In Year 3, I will learn... → My future...

## x and ÷ facts
- To count in multiples of 2, 5 and 10

## Problem solving
- To solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays

| 2 Times Table | 3 Times Table | 5 Times Table |
|---|---|---|
| 1 x 2 = 2 | 1 x 3 = 3 | 1 x 5 = 5 |
| 2 x 2 = 4 | 2 x 3 = 6 | 2 x 5 = 10 |
| 3 x 2 = 6 | 3 x 3 = 9 | 3 x 5 = 15 |
| 4 x 2 = 8 | 4 x 3 = 12 | 4 x 5 = 20 |
| 5 x 2 = 10 | 5 x 3 = 15 | 5 x 5 = 25 |
| 6 x 2 = 12 | 6 x 3 = 18 | 6 x 5 = 30 |
| 7 x 2 = 14 | 7 x 3 = 21 | 7 x 5 = 35 |
| 8 x 2 = 16 | 8 x 3 = 24 | 8 x 5 = 40 |
| 9 x 2 = 18 | 9 x 3 = 27 | 9 x 5 = 45 |
| 10 x 2 = 20 | 10 x 3 = 30 | 10 x 5 = 50 |
| 11 x 2 = 22 | 11 x 3 = 33 | 11 x 5 = 55 |
| 12 x 2 = 24 | 12 x 3 = 36 | 12 x 5 = 60 |

## Counting
- 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 times tables
- To recognise 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 x and ÷ facts

## Counting
- To count in multiples of 4, 8, 50 and 100 from zero
- To find 10 or 100 more or less than a given number

## Reading and writing numbers
- To read and write numbers up to 1,000 in numerals and words
- To read Roman numerals from 1 to 12 (I to XII) - to help with telling the time on an analogue clock

## Comparing numbers
- To compare and order numbers up to 1,000

## Understanding place value
- To recognise the place value of each digit in a three-digit number (hundreds, tens and ones)

## Identifying, representing and estimating numbers
- To identify, represent and estimate numbers using different representations

## In other subjects
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

## Jobs
Shop worker
Bank cashier
Architect
Doctor
Nurse
Teacher
Computer programmer
and many more!

## Vocabulary

| | | | |
|---|---|---|---|
| odd, even | multiply | equal groups of | multiplication table |
| How many times...? | repeated addition | array | multiplication fact |
| lots of | double | divide | division fact |
| groups of | halve | left over | fact families |
| multiple | share equally | row, column | |
| times | group | inverse | |

$$4 \times 2 = 8 = 2 \times 4$$

Multiplication is commutative – multiplication of two numbers can be done in any order.

Ada Lovelace

**Previously, I have learnt...** → **In Year 3, I am learning...** → **In Year 4, I will learn...** → **My future...**

## Previously, I have learnt...

**Counting**
- 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 times tables
- To recognise 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 x and ÷ facts

## In Year 3, I am learning...

**Counting**
- To recall and use multiplication and division facts for the 3, 4 and 8 times tables

**Mental calculation**
- To use known multiplication facts to calculate with mentally

**Written calculation**
- To use formal written methods to multiply two-digit by one-digit numbers

**Inverse operations, estimating and checking answers**
- To estimate the answer to a calculation and use inverse to check answers

**Problem solving**
- To solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems

## In Year 4, I will learn...

**Counting**
- To count in multiples of 6, 7, 9, 25 and 1 000
- To recall multiplication and division facts for times 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.

**Written calculation**
- To multiply two-digit and three-digit numbers by a one-digit numbers using formal written methods

**Properties of numbers**
- To recognise and use factor pairs and commutativity in mental calculations

**Inverse operations, estimating and checking answers**
- To estimate the answer to a calculation and use inverse to check answers

**Problem solving**
- To solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems

## My future...

**In other subjects**
Science – understanding data
DT – taking measurements
PE – keeping score, measuring, angles
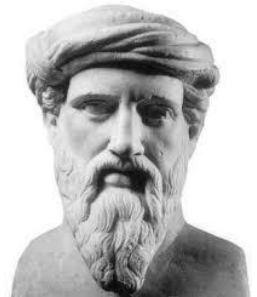Geography – coordinates, maps
Computing – databases, coding

**Life Skills**
Shopping and budgeting
Critical thinking
Playing sport
Map reading
Interpreting statistics
Working with computers

**Jobs**
Shop worker
Bank cashier
Architect
Doctor
Nurse
Teacher
Computer programmer
and many more!

## Vocabulary

| | | |
|---|---|---|
| odd, even | double | row, column |
| How many times...? | halve | inverse |
| lots of | share equally | multiplication table |
| groups of | group | multiplication fact |
| multiple | equal groups of | division fact |
| times | array | fact families |
| multiply | divide | **product** |
| repeated addition | left over | **factor** |

Pythagoras

# Windmill L.E.A.D Academy
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## Mathematics: Year 4
## Multiplication and Division

**Previously, I have learnt...** → **In Year 4, I am learning...** → **In Year 5, I will learn...** → **My future...**

### Previously, I have learnt...

**Counting**
- To recall and use multiplication and division facts for the 3, 4 and 8 times tables

**Mental calculation**
- To use known multiplication facts to calculate with mentally

**Written calculation**
- To use formal written methods to multiply two-digit by one-digit numbers

**Inverse operations, estimating and checking answers**
- To estimate the answer to a calculation and use inverse to check answers

**Problem solving**
- To solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems

### In Year 4, I am learning...

**Counting**
- To count in multiples of 6, 7, 9, 25 and 1 000
- To recall multiplication and division facts for times tables up to 12 x 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.

**Written calculation**
- To multiply two-digit and three-digit numbers by a one-digit numbers using formal written methods

**Properties of numbers**
- To recognise and use factor pairs and commutativity in mental calculations

**Inverse operations, estimating and checking answers**
- To estimate the answer to a calculation and use inverse to check answers

**Problem solving**
- To solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems

### In Year 5, I will learn...

**Counting**
- To recall and apply multiplication and division facts for times tables up to 12 x 12

**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 1,000

**Written calculation**
- To multiply numbers up to 4 digits by a one- or two-digit number using a formal written method
- To divide numbers up to 4 digits by a one-digit number using the formal written method of short division, interpreting remainders appropriately for the context

**Properties of numbers**
- 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 numbers
- To establish whether a number up to 100 is prime and recall the prime numbers up to 19
- To recognise and use square ($^2$) numbers and cube ($^3$) numbers

**Inverse operations, estimating and checking answers**
- To estimate the answer to a calculation and use inverse to check answers

**Problem solving**
- To solve problems involving understanding the meaning of the equals sign
- To solve problems involving multiplication and division, including scaling by simple fraction and problems involving simple rates

### My future...

**In other subjects**
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

**Jobs**
Shop worker
Bank cashier
Architect
Doctor
Nurse
Teacher
Computer programmer
and many more!

### Vocabulary

| | | | |
|---|---|---|---|
| odd, even | repeated addition | divide | fact families |
| How many times...? | double | left over | product |
| lots of | halve | row, column | factor |
| groups of | share equally | inverse | remainder |
| multiple | group | multiplication table | derive |
| times | equal groups of | multiplication fact | scaling |
| multiply | array | division fact | correspondence |

Rene Descartes

## In Year 4, I learnt...

**Counting**
- To count in multiples of 6, 7, 9, 25 and 1 000
- To recall multiplication and division facts for times tables up to 12 x 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.

**Written calculation**
- To multiply two-digit and three-digit numbers by a one-digit numbers using formal written methods

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- To estimate the answer to a calculation and use inverse to check answers

**Problem solving**
- To solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems

## In Year 5, I am learning...

**Counting**
- To recall and apply multiplication and division facts for times tables up to 12 x 12

**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 1,000

**Written calculation**
- To multiply numbers up to 4 digits by a one- or two-digit number using a formal written method
- To divide numbers up to 4 digits by a one-digit number using the formal written method of short division, interpreting remainders appropriately for the context

**Properties of numbers**
- To identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
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- To recognise and use square ($^2$) numbers and cube ($^3$) numbers

**Inverse operations, estimating and checking answers**
- To estimate the answer to a calculation and use inverse to check answers

**Problem solving**
- To solve problems involving understanding the meaning of the equals sign
- To solve problems involving multiplication and division, including scaling by simple fraction and problems involving simple rates

## In Year 6, I will learn...

**Counting**
- To recall and apply multiplication and division facts for times tables up to 12 x 12

**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 numbers up to 4 digits by two-digit numbers using a formal written method
- To divide numbers up to 4 digits by a two-digit number using the formal written method of long division, interpreting remainders as whole number remainders, fractions, decimals, or by rounding, as appropriate for the context

**Properties of numbers**
- To identify common factors, common multiples and prime numbers

**Order of operations**
- To use their knowledge of the order of operations to carry out calculations involving the four operations

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

**Multiplying and dividing decimals**
- To multiply one-digit numbers with up to two decimal places by whole numbers
- To multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
- To use written methods of division in cases where the answer has up to two decimal places

**Problem solving**
- To solve problems involving all four operations, including scaling problems

## My future...

**In other subjects**
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
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**Jobs**
Shop worker
Bank cashier
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Doctor
Nurse
Teacher
Computer programmer
and many more!

## Vocabulary

| | | | | |
|---|---|---|---|---|
| odd, even | repeated addition | row, column | factor | composite number |
| How many times...? | double, halve | inverse | remainder | prime factor |
| lots of | share equally | multiplication table | derive | square, squared |
| groups of | equal groups of | multiplication fact | scaling | cube, cubed |
| multiple | array | division fact | correspondence | formal written |
| times | divide | fact families | factor pairs | method |
| multiply | left over | product | prime number | divisibility |



Katherine Johnson

**In Year 5, I learnt...**

**Counting**
- To recall and apply multiplication and division facts for times tables up to 12 x 12

**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 1,000

**Written calculation**
- To multiply numbers up to 4 digits by a one- or two-digit number using a formal written method
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- To recognise and use square ($^2$) numbers and cube ($^3$) numbers

**Inverse operations, estimating and checking answers**
- To estimate the answer to a calculation and use inverse to check answers

**Problem solving**
- To solve problems involving understanding the meaning of the equals sign
- To solve problems involving multiplication and division, including scaling by simple fraction and problems involving simple rates

**In Year 6, I am learning...**

**Counting**
- To recall and apply multiplication and division facts for times tables up to 12 x 12

**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. $^3/_8$)

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- To multiply numbers up to 4 digits by two-digit numbers using a formal written method
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- To use their knowledge of the order of operations to carry out calculations involving the four operations

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**Multiplying and dividing decimals**
- To multiply one-digit numbers with up to two decimal places by whole numbers
- To multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
- To use written methods of division in cases where the answer has up to two decimal places

**At Key Stage 3, I will learn...**
- To use the concepts and vocabulary of prime numbers, factors, multiples, common multiples, highest common factor, lowest common multiple and prime factorisation
- To use multiplication and division, both as written and mental methods, applied to integers, decimals, proper and improper fractions, and mixed numbers (all both positive and negative)
- To use integer powers and associated roots (square, cube and higher)

**My future...**

**In other subjects**
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

**Jobs**
Shop worker
Bank cashier
Architect
Doctor
Nurse
Teacher
Computer programmer
and many more!

## Vocabulary

| | | | | | | |
|---|---|---|---|---|---|---|
| odd, even | times | equal groups of | multiplication table | remainder | prime factor | divisibility |
| How many times...? | multiply | array | multiplication fact | derive | composite number | order of operations |
| lots of | repeated addition | divide | division fact | scaling | square, squared | common factors |
| groups of | double, halve | left over | fact families | correspondence | cube, cubed | common multiples |
| multiple | share equally | row, column | product | factor pairs | formal written method | factorise |
| | group | inverse | factor | prime number | | |

Muhammad ibn Musa al-Khwarizmi