Sentence Stems / Key Learning

A sentence stem is a very structured sentence that often expresses a key conceptual idea or generalisation. It provides pupils with a way to communicate their ideas with mathematical precision and clarity.

Stem sentences should be used to:

- establish structures and help children move to working in the abstract e.g. ___ times ___ ones is equal to ___ ones, so ___ times ___ tenths is equal to ___ tenths.”
- support pupils to use precise and accurate language in mathematics e.g. addend plus addend equals sum.
- make generalisations about maths to support with problem solving e.g. If one addend is increased by an amount and the other addend is decreased by the same amount, the sum remains the same.

Once pupils have learned to use a core sentence structure, they should be able to adapt and reason with it to apply their lerning in new contexts.

Encourage repetition of the sentence stem throughout the lesson / lessons to come.

Sentence stems can be a whole sentence, for example: ***A half is one of two equal parts.***
or with missing parts to be filled, for example: ***A (fraction) is (numerator) out of (denominator) parts.***
By providing the pupils with a structure to follow, they will have an accurate way to discuss the given topic.

By using repetition, the concepts expressed in the sentence stems will become embedded.

Years 1-6

Year 1 | Number and Place Value

Place Value General

The number before a number is one less. The number after a number is one more.

- *One more than 5 is 6. 6 is one more than 5.*
- *One less than 5 is 4. 4 is one less than 5.*

(number) has (number) tens and (number) ones.

- *24 has 2 tens and 4 ones.*

OR (number) is made from (digit) tens and (digit).

- *24 is made from 2 tens and 4 ones.*

Zero is a place holder. It is used when a place has no value**.**

Comparison

There are more (item) than (item).

- *There are more sticks than bears.*

There are fewer (item) than (item).

- *There are fewer bears than sticks.*

(number) is greater than / more than (number).

- *7 is greater than 5.*

(number) is smaller / less than (number).

- *5 is smaller than 7.*

(number) is equal to (number).

• *5 is equal to 5.*

To compare two-digit numbers, compare the tens digits first. If the tens are the same, compare the ones.

Place Value Within 10

One, two (continue counting). There are (number) items.

Each of the numbers 1-5 can be partitioned in different ways. If we know one part, we can find the other.

- *The whole is five and one part is two so the other part must be three.*

The numbers 6-9 are made of 'five and a bit'. (Number) is five and (number) more.

- *Six is five and one more.*

Place Value Over 10

Ten ones are equal to one group of ten.

(number) ones are equal to (number) tens.

- *20 ones are equal to 2 tens / 2 groups of ten.*

The numbers 11-19 are equal to '10 and a bit'. (Number) is ten and (number) more.

- *12 is ten and 2 more*

There is/ are (digit) tens and (digit) ones in (number).

- There is 1 ten and 5 ones in 15

Counting in 2s / 5s / 10s

There are (number/ items) in each group. There are (number) groups. There are (number/ items) altogether.

- *There are 2 cubes in each group. There are 4 groups. There are 8 cubes altogether*

Whole and Part

A whole can be split into two parts in different ways.
A whole is always bigger than a part of the whole.
A part is always smaller than its whole.

(Number) is the whole; (number) is a part and (number) is a part.

- The five represents all the counters, the three represents the blue counters. The two represents the red counters. Five is the whole, two is a part and three is a part.

The whole/ number is (number). One part is (number), the other part is (number). •

- *The whole is 17. One part is 10, the other part is 7.*

A whole can be represented by one object or one group of objects.

- *This is the whole carrot because I have all of it.*
- *This is not the whole apple because I don't have all of it / I only have part of it*
- *This is the whole group of cakes because I have all of them.*
- *This is not the whole group of cakes because some of them are missing / because we don't have all of them.*
- *There are four pencils in the whole group, there are three pencils in this part of the group.*

Odd and Even Numbers

Numbers that can be made out of groups of two are even.

Numbers that cannot be made out of groups of two are odd.

A number is even if the ones digit is even, it can be made out of groups of two.

A number is odd if the ones digit is odd, it cannot be made from groups of two.

We only need to look at the ones digit t.o know if a number is odd or even

Vocabulary

Subitise
Digit
Order
Compare
Numbers from 1 to 100
Forwards / Backwards
Equal / unequal
More/ most
Less/ least
Greater than
Less than
Before / after
Partition
Multiples
Twos (2s), Fives (5s), Tens (10s)
Ordinal numbers - first, second...tenth
Last
Odd / even

Year 2 | Number and Place Value

Place Value General

Consecutive numbers always have a difference of one.

Consecutive odd numbers always have a difference of two.

Consecutive even numbers always have a difference of two.

One more than (number) is (number).
OR (number) is one more than (number).

- *One more than 21 is 22. 22 is one more than 21.*
- *One less than (number) is (number).*

OR (number) is one less than (number). •

- *One less than 21 is 20.*
- *20 is one less than 21.*

Comparison

(number/ items) is greater than (number/ items).

- *15 is greater than 11.*

(number/ items) is less than (number/ items).

- 11 is less than 15.

(number/ items) is equal to (number/ items).

- *15 is equal to 15.*

(number) is greater than (number) but less than (number).
• 38 is greater than 27 but less than 40.

Tens and Ones

There is/ are (digit) ten(s) and (digit) one(s). The number is (number).

- *There are 3 tens and 1 one. The number is 31.*

(digit) ten(s) + (digit) one(s) = (number)

- *3 tens + 1 one = 31*

Counting in 2s / 5s / 10s

There are (number/ items) in each group.
There are (number) groups.
There are (number/ items) altogether.

- *There are 2 cubes in each group. There are 4 groups. There are 8 cubes altogether.*

When counting in tens, the ones column will not change.

Vocabulary

Hundred (one hundred etc)
Regroup
Digit
Greater than >
Less than <
Count in steps
Numberline
Intervals
Estimate
Compare
Consecutive
Place holder

Year 3 | Number and Place Value

Place Value General

There are ten tens in one hundred.

There are one hundred ones in one hundred.

The (item) represents (number). The value of (items) is (number).

- *The green counter represents 10. The value of the 3 green counters is 30.*

The digit (digit) is in the (place value) column. It has a value of (number).

- *236 - The digit 6 is in the ones column. It has a value of 6. The digit 3 is in the tens column. It has a value of 30. The digit 2 is in the hundreds column. It has a value of 200.*

One/ ten / one hundred more/ less than (number) is (number).
OR (number) is one/ ten / one hundred more/ less than (number). •

- *Ten more than 15 is 25.* OR *25 is ten more than 15.*

When finding ten more/ less, the ones column does not change.*

When finding one hundred more/ less, the ones and tens columns do not change.

Hundreds, Tens and Ones

There are (digit) hundred(s), (digit) ten(s) and (digit) one(s). The number is (number).

- *There are 7 hundreds, 2 tens and 8 one. The number is 728.*

(digit) hundreds + (digit) tens + (digit) ones = (number)

- *7 hundreds + 2 tens + 8 ones = 728*

Comparison

When comparing three-digit numbers, start with the hundreds. If the hundreds are the same, compare the tens. If the tens are the same, compare the ones.

Vocabulary

Fifties (50s)
Estimate
Approximately / approximate
Ascending / descending
10 more / less
100 more / less
Flexible partitioning
Intervals

Year 4 | Number and Place Value

Place Value General

When finding one thousand more/ less than a positive number, the ones and tens columns do not change.

There are ten hundreds in one thousand.
There are one hundred tens in one thousand.
There are one thousand ones in one thousand.

There are (digit) thousand(s), (digit) hundred(s), (digit) ten(s) and (digit) one(s). The number is (total).

- *There are 2 thousands, 5 hundreds, 3 tens and 9 ones. The number is 2,539.*

Rounding

These can be adapted for rounding to 100 or 1,000:

The previous multiple of ten is (multiple of 10). The next multiple of ten is (multiple of 10). (number) is nearer to (multiple of 10). (number) rounded to the nearest ten is (multiple of 10).

- *34 - The previous multiple of ten is 30. The next multiple of ten is 40. 34 is nearer to 30. 34 rounded to the nearest ten is 30.*

When rounding to the nearest 10, if the ones digit is four or less, round to the previous multiple. If the ones digit is five or more, round to the next multiple.

Comparison

To compare two numbers, start with the largest place value digit. Compare digits with the same place value.

Negative Numbers

Negative numbers are less than or below zero.
Positive numbers are greater than or above zero.

Decimal Numbers

When one is divided into ten parts, each part is one tenth of the whole. 1 is ten times the size of 0.1.

When one whole is divided into 100 parts, each part is one hundredth of the whole. 1 is one hundred times the size of 0.01.

Vocabulary

Thousand
Rounding to the nearest 10/100/1000
Twenty-fives (25s)
Positive (number)
Negative (number)
Roman Numerals to 100
Numberline - midpoint, intervals
Whole number
Decimal number
Tenths
Hundredths

Year 5 | Number and Place Value

Place Value General

There are ten one thousands in ten thousand.
There are one hundred hundreds in ten thousand.

There are ten ten thousands in one hundred thousand.
There are one hundred one thousands in one hundred thousand.

There are ten hundred thousands in one million.
There are one hundred tens of thousands in one million.

Rounding

When rounding to a power of ten, the digit to the right of the place value you are rounding determines how you round.

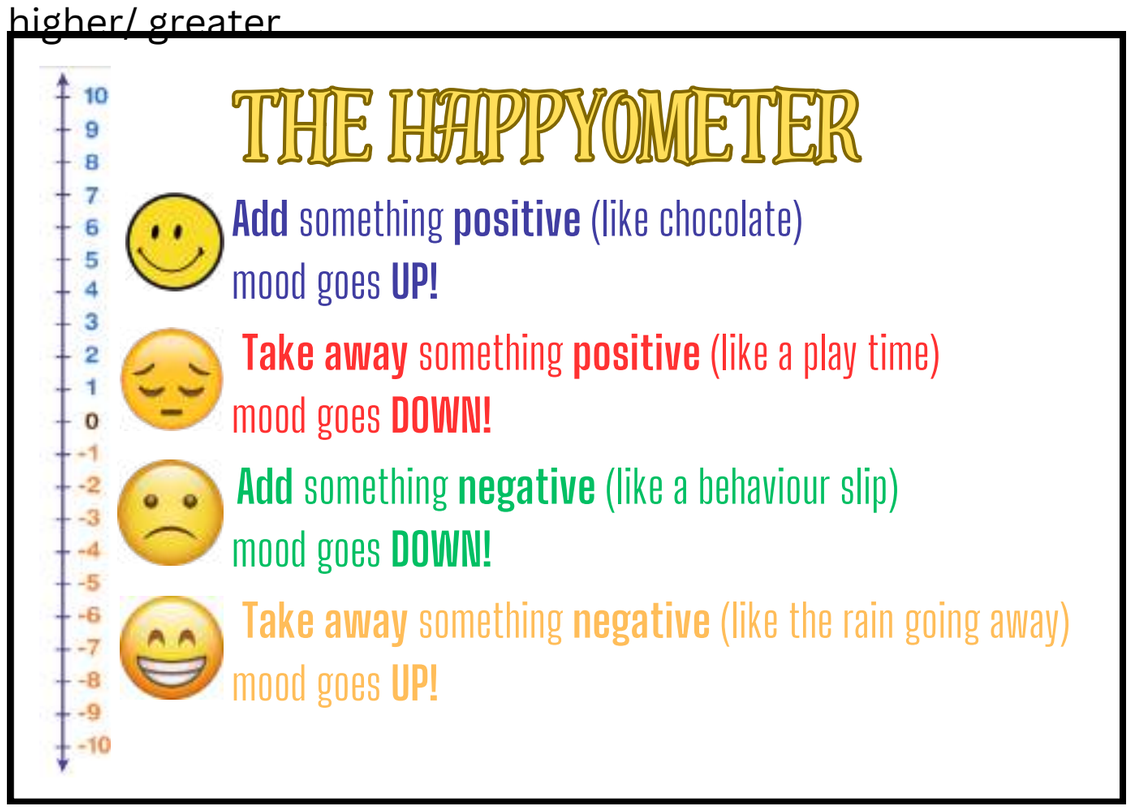
Powers of ten

10 to the power of 2 is 10 x 10 = 100 10^2
10 to the power of 3 is 10 x 10 x 10 = 1000 10^3

Negative Numbers

For positive and negative numbers, the larger the number, the further away from zero it is. (34 is further from zero than 2 and -34 is further from zero than -2).

If we add a positive number, the number gets higher/ greater. If we subtract a positive number, the number gets lower/ smaller.
If we add a negative number, the number gets smaller/ lower. If we subtract a negative number, the number gets higher/ greater



Vocabulary

Ten thousand (10,000)
One hundred thousand (100,000)
One million (1,000,000)
Integer
Roman Numerals to 1000
Powers of 10
Less than or equal to ≤
Greater than or equal to ≥
Approximately equal to
Positive / negative

Year 6 | Number and Place Value

Place Value General

There are one thousand thousands in one million.

Vocabulary

Million
Half a million
Ten million (10,000,000)
Factorise
Prime
Prime Factor

Year 1 | Addition and Subtraction

Adding/ Subtracting General

Part + part = whole, whole = part + part
Whole - part = part, part = whole - part

Adding one gives one more.

Subtracting one gives one less.

When zero is added to a number, the number does not change

When zero is subtracted from a number, the number does not change.

Addition is commutative. We can change the order of the addend and the sum remains the same.

- *6 + 3 = 3 + 6*

Subtraction is not commutative.

- *6 - 3 is not equal to 3 - 6*

Adding

Addend plus addend equals sum.
Sum equals addend plus addend.

The whole is (number). One part is (number), so the other part must be (number). OR (number) is the whole, (number) is a part, (number) is a part.

- *The whole is 10. One part is 4, so the other part must be 6. OR 10 is the whole, 4 is a part, 6 is a part.*

There are (number/ item) and (number/ item). We can write this a (number) plus (number).

- *There are 5 cars and 5 trains. We can write this as 5 plus 5.*

(number) is equal to (number) plus (number). OR (number) plus (number) is equal to (number).

- *6 is equal to 2 plus 4. OR 2 plus 4 is equal to 6.*

There are (number/ item). There are (number/ item). There are (number/ item/ description) altogether.

- *There are 5 red cards. There are 3 black cards. There are 8 cards altogether*

Ten plus (number) is equal to (number).

- *Ten plus 5 is equal to 15.*

(number) and (number) are the addends. (number) is the sum.

- *4 and 2 are the addends. 6 is the sum.*

We can change the order of the addends but the sum remains the same.

Subtracting

(number) is equal to (number) subtract (number). OR (number) subtract (number) is equal to (number).

- *6 is equal to 8 subtract 2. OR 8 subtract 2 is equal to 6.*

The difference between (number) and (number) is (number).

- *The difference between 10 and 7 is 3.*

There are (number/ item) and (number/ item) are taken away. We can write this as (number) subtract (number).

- *There are 7 cars and 5 cars are taken away. We can write this as 7 subtract 5.*

First...then...now

First there were (number/ item). Then there were (number/ item) added. Now there are (number/ item).

- *First there were 6 apples. Then there were 3 apples added. Now there are 9 apples.*
-

First there were (number), then (number) were subtracted, (number) were left.

- First there were 10, then 2 were subtracted, 8 were left.
- First, four people were sitting on the bus, then one person got off. Now there are three people left on the bus.

If we know any two parts of the story, we can work out the third part.

If we know any two numbers in an equation, we can work out the third part.

- *We don't know how many coins Jamal had to start with at **first.** **Then** he got two more. **Now** he has five coins. How many coins did Jamal have at **first**?*

Vocabulary

Add /Addition
Addend
Sum
Total
Altogether
How many more...
Subtract
Take away
Left (left over)
Fewer
Difference
Minus
Equals
The same as
Partition
Double
Near double

Year 2 | Addition and Subtraction

Adding/ Subtracting General

When adding numbers, we can add them in any order.
We can change the order of the addends but the sum remains the same.

(number) plus (number) is equal to (number) so (number) plus (number) is equal to (number).

- *There are two ways to use this: 7 plus 3 is equal to 10 so 7 plus 4 is equal to 11. OR 7 plus 3 is equal to 10 so 17 plus 3 is equal to 20.*

(number) minus (number) is equal to (number) so (number) minus (number) is equal to (number).

- *There are two ways to use this: 10 minus 7 is equal to 3 so 11 minus 7 is equal to 4. OR 10 minus 7 is equal to 3 so 20 minus 7 is equal to 13.*

The value on both sides of the equals symbol must be the same.

The more we subtract, the less we are left with.

The less we subtract, the more we are left with.

Two digit numbers can be partitioned in different ways.

When adding three numbers, we should look for the most efficient order in which to add them.

- We can look for pairs of addends which sum to ten, we can use a 'make ten' strategy by partitoning one of the addends.

Adding / Subtracting 10

When adding 10, the tens digit changes, the ones digit stays the same.

When subtracting 10, the tens digit changes, the ones digit stays the same.

If (number) plus (number) is equal to (number), then (number) tens plus (number) tens is equal to (number) tens.

- *If 3 plus 2 is equal to 5, then 3 tens plus 2 tens is equal to 5 ten.*

This is (number). Ten more than (number) is (number). (number) is ten more than (number).

- *This is 5. Ten more than 5 is 15. 15 is ten more than 5.*

If (number) minus (number) is equal to (number), then (number) tens minus (number) tens is equal to (number) tens.

- *If 3 minus 2 is equal to 1, then 3 tens minus 2 tens is equal to 1 ten.*

This is (number). Ten less than (number) is (number). (number) is ten less than (number).

- *This is 15. Ten less than 15 is 5. 5 is ten less than 15.*

Partitioning

(First number) can be partitioned into (number) tens and (number) ones.
(Second number) can be partitioned into (number) tens and (number) ones.
(number) tens + (number) tens = (number) tens.
(number) ones + (number) ones = (number) ones
(number) tens + (number) ones = (number)

- *For 23 + 21. 23 can be partitioned into 2 tens and 3 ones. 21 can be partitioned into 2 tens and 1 one. 2 tens + 2 tens = 4 tens, 3 ones + 1 one = 4 ones, 4 tens + 4 ones = 44*

To subtract (number), first subtract (number) then subtract (number).

- *To subtract 6, first subtract 5 then subtract 1. OR To subtract 13, first subtract 3 then subtract 10.*

Subtraction as difference

The (number) represent the number of ____, the (number) represents the number of ____, the (number) represents the difference between the number of ___ and the number of ____.

- *The 8 represents the number of children, the 3 represents the number of pencils, the 5 represents the difference between the number of children and the number of pencils.*

For a subtraction calculation where both numbers have the same ones digit, the difference is a multiple of 10.

Vocabulary

Commutative
Crossing / bridging the (tens) boundary
Regrouping
Difference
Sum
Partitioning / flexible partitioning

Year 3 | Addition and Subtraction

Adding/ Subtracting General

Addend plus addend equals the sum.

The minuend is the number we need to subtract from.

Minuend minus subtrahend is equal to the difference.

When using column addition/ subtraction, start with the right most column.

Adding

(number) one(s) add (number) one(s) is equal to (number) one(s).
(number) ten(s) add (number) ten(s) is equal to (number) ten(s).

- *For 35 + 23. 5 ones add 3 ones is equal to 8 ones. 3 tens add 2 tens is equal to 5 tens.*

When adding, if the (ones/ tens/ hundreds) is equal to (10/ 100/ 1,000 etc), we must regroup to the column on the left**.**

Subtracting

(number) one(s) subtract (number) one(s) is equal to (number) one(s).
(number) ten(s) subtract (number) ten(s) is equal to (number) ten(s).

- *For 35 - 23. 5 ones subtract 3 ones is equal to 2 ones. 3 tens subtract 2 tens is equal to 1 ten.*

If we cannot subtract, we must regroup from the column to the left.

Finding the difference

Subtraction calculations can be solved using a 'find the difference' strategy. This is the same as 'adding on' to find a missing part.

'The finding the difference' strategy for subtraction is an efficient strategy for calculating change when paying in whole pounds or notes.

Vocabulary

Addend
Sum
Minuend
Subtrahend
Subtrahend
Difference
Regroup
Inverse
Commutative

Year 4 | Addition and Subtraction

Subtracting General

The minuend is the whole.
The subtrahend and the difference are parts.

If we know the minuend and subtrahend we have to subtract to find the difference (the missing part)

If we do not know the minuend (whole), we have to add the subtrahend and the difference (parts) together to find it.

If we do not know the subtrahend, we have to subtract the difference from the minued to find the missing part.

Order of Addition / Subtraction

For calculations involving both addition and subtraction, we can add then subtract or subtract then add. The final answer will be the same.

Vocabulary

Inverse

Year 5 | Addition and Subtraction

Adding/ Subtracting General

If one addend is increased by an amount and the other addend is decreased by the same amount, the sum remains the same.

If one addend is increased (or decreased) and the other addend remains the same, the sum increase (or decreases) by that amount.

If you have increased (or decreased) the minuend and subtrahend by the same amount, the difference stays the same.

If the minuend is increased (or decreased) and the subtrahend remains the same, the difference must increase (or decrease) by the same amount.

The more we subtract the less we are left with. The less we subtract, the ore we are left with.

For calculations that involve both addition and subtraction steps, we can add then sbtract or subtract then add; the final answer is the same.

Addition and Multiplication

When a whole is split into equal parts, it can be both an additive and a multiplicative number sentence.

Missing Number Calculations

For a question where the whole is split into three parts and two of the values are known; the sum of the two known parts plus the missing part is equal to the whole.

For a question where the whole is split into three parts and two of the values are known; the whole minus the two known parts is equal to the missing parts.

Estimate to Check Answers

(First number) rounds to (number).

(Second number) rounds to (number).

When (adding/ subtracting) (first number) to/from (second number) the answer will be approximately (number).

- *3,981, rounds to 4,000. 8,231 rounds to 8,000*. When adding 3,981 to 8,231, the answer will be approximately 12,000.

Balanced Equations

The value of the expressions on each side of the equals sign must be the same.

Vocabulary

Additive
Estimation
Approximate
Balanced Equation

Year 6 | Addition and Subtraction

Addition and Multiplication

When estimating you find an approximate answer.

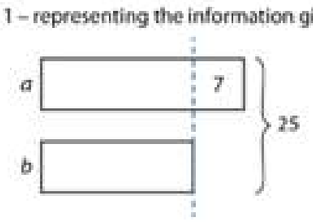
Problems with two unknowns

Problems with two unknowns can have more than one solution.

A problem with two unknowns only has one solution if the sum of the two unknowns and the difference between them is given, or if the sum of the two unknowns and a multiplicative relationship between them is given.

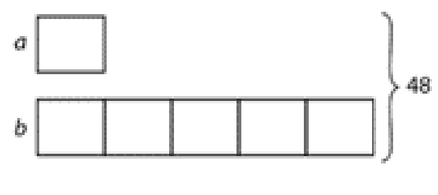
'The sum of two numbers, a and b, is 25, and the difference between them is 7. What are the two numbers?

Step 1 – representing the information given:



'The sum of two numbers is 48. One number is one-fifth of the other number. What are the two numbers?'

- *'There are six equal parts that sum to forty-eight.'*



Vocabulary

See previous vocabulary

Year 1 | Multiplication and Division

Equal / unequal groups

Objects can be grouped into equal or unequal groups.

There are (number) groups/lots/sets of (number/ item).

- *There are 3 groups of 5 cars.*

This is not (number) groups/lots/sets of (number/ item) as they are not equal groups.

- *This is not 2 groups of 10 sweets, as they are not equal groups.*

Equal groups can be represented with repeated addition or multiplication.

Arrays

In this array, there is/ are (number/ item) in each row. There is/ are (number) rows of (number/ items).

- *In this array, there are 5 oranges in each row.*

There are 6 rows of 5 oranges. In this array, there is/ are (number/ item) in each column. There is/ are (number) columns of (number/ item).

- *In this array, there are 10 cookies in each column. There are 3 columns of 10 cookies.*

Doubling

Double (number) is (number).

- *Double 5 is 10.*

Twice as much as (number) is (number).

- *Twice as much as 5 is 10.*

Grouping

One group of (number), two groups of (number), three groups of (number)...

- *One group of 5, two groups of 5, three groups of 5,...*

Each (item) can hold (number/ item). (number/ item) will need (number/ item).

- *Each box can hold 2 cupcakes. 8 cupcakes will need 4 boxes.*

There are (number) equal groups of (number). There are (number) altogether.

- *There are 6 equal groups of 2. There are 12 altogether.*

We can write a multiplication sentence where the groups contain 0 items and where the groups contain 1 item.

Sharing

(number/ item) have been shared equally into (number) groups/ lots/sets. There are (number/ item) in each group/lot/set. OR each group/lot/set has (number/ item).

- *15 toy cars have been shared equally into 3 groups. There are 5 toy cars in each group. OR Each group has 5 toy cars.*

(number/ item) have not been shared equally between (number) groups/lots/sets. There are not equal groups/lots/sets of (item).

- *20 sweets have not been shared equally between 3 groups.*

There are not equal groups of sweets. Share (number) equally between (number) groups. Each group has (number).

- *Share 14 equally between 2 groups. Each group has 7.*

Vocabulary

Lots of / Sets of / Groups of
Equal groups
Array
Row
Column
Patterns
Double / Doubling
Twice as much as...
Twos Fives Tens
Skip counting
Equal groups of / Equal sets of
Grouping
Share equally / Sharing / Share
Half Halves Halving
Half as much/ many as...

Year 2 | Multiplication and Division

General Multiplication

Multiplication is commutative – you can swap the order of the numbers in the calculation.

- *5 groups of 4 is the same as 5 times 4, which equals 20.*

(number) is a multiple of (number) because it is in the (number) times table.

- 8 is a multiple of 2 because it is in the 2 times table.

(number) cannot be in the (number) times table because…

- *21 cannot be in the 10 times table because….*

Halving is the inverse of doubling.

Repeated Addition / Arrays

There are (number) groups of (number/ item). (number) (number) = (number). There are (number/ item) altogether.

- *There are 3 groups of 5 stars. 5 + 5 + 5 = 15. There are 15 stars altogether.*

(number a) x (number b) = (number b) x (number a).

- *3 × 10 = 10 × 3*

In this array, there are (number/ item) in each row. There are (number) rows of (number/ item). So (number) x (number) = (total)

- *In this array, there are 5 oranges in each row. There are 6 rows of 5 oranges. So 5 × 6 = 30*

Grouping

(number a) can be put into groups of (number b). This is the same as (number a) being divided into groups of (number b), which equals (number c). This can be written as (number a) ÷ (number b) = (number c)

- *20 can be put into groups of 4. This is the same as 20 divided into groups of 4, which equals 5. This can be written as 20 ÷ 4 = 5*

(number a) divided by (number b) equals (number c).

- *20 divided by 4 equals 5.*

Sharing

(number a) can be shared equally between (number b) groups/lots/etc.

- *20 can be shared equally between 4 groups. This is the same as 20 shared into 4 groups, which equals 5. This can be written as 20 ÷ 4 = 5*

(number a) can be shared equally into (number b) groups/lots/sets because (number a) is a multiple of (number b).

- *20 can be shared equally into 2 groups because 20 is a multiple of 2.*

(number a) cannot be shared into (number b) groups/lots/sets because there is/are (number c) left over.

- *21 cannot be shared equally into 2 groups because there is 1 left over.*

Division is **not** commutative – you cannot swap the numbers around in the calculation/equation.

Factors and Products

For equally grouped objects, the number of groups is a factor, the group size is a factor and the total number of objects is the product.

Factor times factor is equal to the product.
The product is equal to factor times factor.

Factor pairs can be written in either order and the product will remain the same. (commutativity)

When 0 is a factor, the product is zero

When 1 is a factor, the product is equal to the other factor.

When one factor is 2, the product is double the other factor.

Linking the 5 and 10 times tables

(For every group of 10, there are two groups of 5.
Products in the 10 times table are also in the 5 times table.

Number	**0**	1	2	3	4	**5**	6	7	8	9	**10**	11	12	13	14	**15**	16	17	18	19	**20**	21	22	23	24	**25**
Counting in 5s	✓					✓					✓					✓					✓					✓
Counting in 10s	✓										✓										✓					

Remainders

(Objects that can't begrouped equally have a remainder.

Divisibility Rules

A number can be divided by two if the ones digit is even.

A number can be divided by ten if the ones digit is zero.

A number can be divided by five if the ones digit is five or zero.

Vocabulary

Times / Multiply
Multiplied by
Multiple of
Repeated addition
Ten/five times as much/many as…
Commutative
Bar model
Divided by
Grouped
Shared
Repeated subtraction
Remainder
Multiple
Factor
Product

Year 3 | Multiplication and Division

General Multiplication

(I know that (number a) times (number b) equals (number c) because (number b) times (number a) equals (number c).

- *I know that 3 times 6 equals 18 because 6 times 3 equals 18.*

The product of (number a) and (number b) is (number c).

- *The product of 7 and 4 is 28.*

If (number a) x (number b) = (number c), then (number c) ÷ (number a/b) = (number b/a)

- I*f 3 × 8 = 24, then 24 ÷ 8 = 3 OR 24 ÷ 3 = 8*

Odd factor x odd factor = even product
Even factor x even factor = even product
Odd factor x even factor = odd product

Multiply and divide by 4 and 8

To calculate 4 lots of (number), I can double (number) and double the answer.

- *To calculate 4 lots of 6, I can double 6 and double the answer.*

To multiply by 8, I can double and double again.

To divide a number by 4, I can half the number and half the answer.

To find a quarter of something is the same as dividing by 4.

To divide something by 8, I can halve, halve and halve again.

For every group of 4 there are two groups of 2.

Products in the 4 times table are also in the 2 times table.

Products in the 4 times table are double the products in the 2 times table.

Products in the 8 times table are also in the 2 and 4 times tables.

Number	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Multiples of 2	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓
Multiples of 4	✓				✓				✓				✓				✓				✓				✓
Multiples of 8	✓								✓								✓								✓

For numbers with more than two digits: if the final two digits are divisible by four then the number is divisible by four.

Scaling

There are (number) times as many (item) as (item).

- *There are 3 times as many red tops as blue tops.*

Inverse

The inverse of 'multiply' is 'divide'.

Correspondence

E.g. How many outfits combinations could be made? (number a/ item a) and (number b/ item b) means (number a) x (number b). So there are (product) different combinations.

- *4 shirts and 3 shorts means 4 × 3. So there are 12 different combinations.*

Using known facts

Examples:

- I know that 24 ÷ 3 = 8 because 8 × 3 = 24
- 72 ÷ 8 = ?, this means ? × 8 = 72
- If 8 × 7 = 56, then 56 tens ÷ 7 = 8 tens, so 560 ÷ 7 = 80.
- If 40 ÷ 4 = 10, then 40 tens ÷ 4 = 10 tens, so 400 ÷ 4 = 100

Remainder

(number a) is not in the (number b) times tables; when you divide (number a) by (number b) there is a remainder of (number c).

- *32 is not in the 3 times tables; when you divide 32 by 3 there is a remainder of 2.*

Using known facts

If (number a) x (number b) = (number c), then (number a) tens x (number b) = (number c) tens.

- *If 8 × 7 = 56, then 8 tens × 7 = 56 tens = 560 and 8 × 7 tens = 56 tens = 560*

If (number a) x (number b) = (number c), then (number c) ÷ (number a/b) = (number b/a)

- *If 40 × 2 = 80, then 80 ÷ 2 = 40 OR 80 ÷ 40 = 2*

General Division

Dividend ÷ divisor = quotient

The dividend is the number you are dividing.

The divisor is the number you are dividing by.

The quotient is the answer to a division fact. (42 ÷ 6 = 7, so the quotient is 7).

If the divisor is 2, the quotient is half of the dividend.

Vocabulary

Product
Factor
Scaling
Correspondence
Remainder
Inverse
Dividend
Quotient
Divisor

Year 4 | Multiplication and Division

Multiplying / Dividing by zero / one

When the dividend is zero, the quotient is zero.

When one factor is 1, the product is equal to the other factor.

When the divisor is one, the quotient is equal to the dividend.

When the dividend is the same as the divisor, the quotient is one.

Multiplying / Dividing by 10 / 100

When multiplying by 10, the digits move one place to the left. The number is ten times bigger. To multiply a whole number by 10, add a placeholder.

When multiplying by 100, the digits move two places to the left. The number is 100 times bigger. To multiply a whole number by 100, add two placeholders.

When dividing by (10 or 100), the number is being split into (10 or 100) equal parts. The number is (10 or 100) times smaller.

When dividing by 10, the digits move one place to the right. he number is 10 times smaller. To divide a multiple of 10, remove the final placeholder.

When dividing by 100, the digits move two places to the right. The number is 100 ties smaller. To divide a multiple of 100 by 100, remove the final two placeholders.

Multiplying a number by 100 is the same as multiplying by 10 and then multiplying the product by 10.
Dividing a number by 100 is the same as dividing by 10 and dividing the quotient by 10.

If one factor is made 10 (100) times bigger then the product will be 10 (100) times bigger.

If the dividend is 10 (100) times the size, the quotient will be 10 (100)times the size.

Linking times tables

(To multiply by 6, I can multiply by 3 and double the product. For every group of 6 there are two groups of 3.

For every group of 12, there are 2 groups of 6.

For every group of 9 there are 3 groups of 3.

Inverse

I know that 48 ÷ 6 = 8 because 8 × 6 = 48

Factor / factor pair and Multiples

(number a) ÷ (number b) = (number c), so (number b) and (number c) are factors of (number a).

- *42 ÷ 8 = 6, so 8 and 6 are factors of 42.*

The product of (number a) and (number b) is (number c), so (number b) and (number c) are a factor pair of (number a)

- *The product of 6 and 8 is 42, so 6 and 8 are a factor pair of 42*

(number a) is a multiple of both (number b) and (number c).

- *2 is a multiple of both 8 and 6*

Remainders

If the dividend is a multiple of the divisor there is no remainder. If the dividend id not a multiple of the divisor there is a remainder.

The remainder is always less than the divisor.

When solving word problems with remainders, we need to think about the context.

- *4 scouts can fit in each tent, how many tents are needed for 30 scouts? 30 ÷ 4 = 8 r 2. We need another tent for the 2 left over scouts. 8 tents are needed.*

Connecting Multiplication and Division / Distributive law

The product in a multiplication calculation has the same value as the dividend in the matching division equation.

The factors in a multiplication calculation have the same values as the divisor and the quotient in the matching division calculation.

Multiplication is commutative, division is not commutative.

Multiplication is distributive - we can work out products by partitioning one of the factors.

- $9 \times 8 = 10 \times 8 - 1 \times 8$
- $11 \times 8 = 10 \times 8 + 1 \times 8$
- 12 groups of 6 is the same as 10 groups of 6 plus 2 groups of 6

Written Methods - Multiplication

If there are more than 10 ones, we need to regroup them into tens and ones. If there are more the 10 tens, we need to regroup into hundreds and tens.

Written Methods - Multiplication

If dividing the tens leaves a remainder, we need to regroup the remaining tens for ones. If dividing the hundreds leaves a remainder, we need to regroup the remaining hundreds for tens.

Vocabulary

Inverse
Distributive law
Dividend
Divisor
Quotient
Divisible by
Factor
Factor pair
Product
Square number

Year 5 | Multiplication and Division

Factors, Multiples, Prime Numbers and Composite Numbers

1 is a factor of all positive integers.

Every positive integer is a factor of itself.

The smallest factor of a positive integer is 1, the largest factor of a positive integer is itself.

Factors come in pairs, all positive integers have an even number of factors apart from square numbers. Square numbers have an odd number of factors.

A **common factor** is a factor that is shared by two or more numbers.

Numbers that have more than two factors are **composite numbers.**

Numbers that only have two factors are **prime numbers.** A prime number only has two factors, 1 and itself.

Common multiples of given numbers are numbers that are in the times tables of both numbers. Common multiples of (number a) and (number b) are ....

- Common multiples of 2 and 5 are 10, 20, 30....

Multiplying and Dividing by 1000

When multiplying by 1,000, the digits move three places to the left. When multiplying by 1,000, the number is 1,000 times bigger. To multiply a whole number by 1000, add three placeholders.

When dividing by 1,000, the digits move three places to the right. When dividing by 1,000, the number is 1,000 times smaller.

Square Number

When both factors are the same, the product is called a square number.

Square numbers can be represented by square arrays.

Cube Number

A cube number is made when you multiply a number by itself twice. (number) x (number) x (number) = (product), so (product) is a cube number.

- *2 × 2 × 2 = 8, so 8 is a cube number*

Decimal Fractions

Multiplying by 0.1 is equivalent to dividing by 10.
Multiplying by 0.01 is equivalent to dividing by 100.

If one factor is made one-tenth (one-hundredth)the size, the product will be one-tenth (one-hundredth) the size.

When a number is multiplied by a factor greater than one, the product is greater than the original number.

When a number is multiplied by a factor less than one, the product is less than the original number.

Equivalence

If we double one factor and halve the other factor, the product will remain the same.

If we multiply one factor and divide the other factor by the same amount, the product will remain the same.

If we multiply the dividend and divisor by the same amount, the quotient will remain the same.

Divisible by

(number a) is a multiple of (number b). This means that (number a) is divisible by (number b).

- *108 is a multiple of 9. This means that 108 is divisible by 9.*

(number a) is divisible by (number b) because (number b) x (number c) = (number a)

- *108 is divisible by 9 because 9 × 12 = 108*

Combining multiplicatoin with addition and subtraction

(When there are no brackets, multiplication is complete before addition and subtraction.

When there are brackets, the calculation in the brackets is completed first

Vocabulary

Common factors
Common multiples
Composite numbers
Square / Squared
Cube / Cubed
Prime
Multiplying / Dividing by 10, 100 and 1,000
Decimal Fraction

Year 6 | Multiplication and Division

Lowest Common Multiple

The smallest common multiple of any given numbers is called the lowest common multiple (LCM). The LCM of (number) and (number) is (LCM).

- *The LCM of 3 and 6 is 6.*

Indices (Powers)

Indices show how many times to multiply a number by itself.

For (number) squared, write (number)2.
This is the same as (number) x (number).

- *For 5 squared, write 5^2. This is the same as 5 x 5.*

For (number) cubed, it is the same as (number) x (number) x (number). This can be read as (number) to the power of 3.

- *For 5 cubed, it is the same as 5 x 5 x 5. This can be read as 5 to the power of 3.*

Order of operations

A bracket is used to tell us which part of an equation to do first.

When there are brackets, the calculation within the brackets is always completed first.

Multiplication and division have equal priority and should be copleted before additions and subtractions.

BIDMAS or BODMAS

BIDMAS or BODMAS tells us the order in which to complete a calculation.

- **B**rackets, **I**ndices, **D**ivision & **M**ultiplication, **A**ddition and **S**ubtraction.
- **B**rackets, **O**rders, **D**ivision & **M**ultiplication, **A**ddition and **S**ubtraction. .

Combining Multiplication and Division with Addition and Subtraction

When two dividends are divided by the same divisor, we can add / subtract the dividends first and then divide.

Highest Common Factor

(The highest common factor (HCF) is the largest common factor of given numbers. The common factors of (number) and (number) are ... – the HCF is (number).

- *The common factors of 16 and 20 are 1, 2 and 4 – the HCF is 4.*

Using Compensation to Calculate

For multiplication, if there is a multiplicative change to one factor, the product changes by the same scale factor.

For division, if there is a multiplicative change to the dividend and the divisor remains the same, the quotient changes by the same scale factor.

For division, if there is a multiplicative increase to the divisor and the dividend remains the same, the quotient decreases by the same scale factor; if there is a multiplicative decrease to the divisor and the dividend remains the same, the quotient increases by the same scale factor.

	True (✓) or false (✗)
Since 16 × 8 = 128 Then 32 × 8 = 256	
Since 7,344 ÷ 72 = 102 Then 7,344 ÷ 36 = 51	
Since 5,985 ÷ 63 = 95 Then 5,985 ÷ 126 = 190	
Since 1,764 ÷ 42 = 42 Then 1,764 ÷ 84 = 21	

Mean Average

The mean is the size of each part when a quantity is shared evenly.

If the number of values in the set stays the same and the total increases, the mean also increases.

If the number of values in the set stays the same and the total decreases, the mean also decreases.

Vocabulary

Indices (powers)
Lowest common multiple
Highest common factor
Brackets
Order of operations (BIDMAS or BODMAS)
Mean average

Year 1 Fractions

Fractions General

A fraction is a number that represents equal parts of a whole.

Equal parts look exactly the same.

Parts and Wholes

The whole is the total number of parts.

The whole is always bigger than a part of the whole.

A part is always smaller than the whole.

This is a whole (item) because I have all of it.
OR This is a whole group of (items) because I have all of them.

- *This is a whole cake because I have all of it. OR This is a whole group of cakes because I have all of them.*

This is a not whole (item) because I don't have all of it.
OR This is not a whole group of (items) because I don't have all of them.

- *This is not a whole circle because I don't have all of it. OR This is not a whole group of circles because I don't have all of them.*

If (item/ number) is the whole then (item/ number) is part of the whole.

- *If 4 is the whole then 2 is part of the whole.*

Half

A half is one of two **equal parts**.

There are (number/ items). Half of (whole) is (half).

- *There are 8 counters. Half of 8 is 4.*

It is split in half because it is in two equal groups.

It is not split in half because it is not in two equal groups.

Quarter

A quarter is one of four **equal parts**.

Vocabulary

Fraction
Whole
Equal parts
Equal grouping
Equal sharing
Parts of a whole
Half
Quarter

Year 2 Fractions

Fractions General

A unit fraction is any fraction where the numerator is 1.
A unit fraction is one equal part of a whole.

The denominator is the total number of equal parts that make up a whole. **The whole has been divided into ___ equal parts.**

The numerator shows the number of equal parts being looked at. **The whole has been divided into ___ equal parts, I have ___ of them.**

If the numerators are the same, the larger the denominator the larger the fraction.
If the numerators are the same, the smaller the denominator the smaller the fraction.

If the denominators are the same, the larger the numerato, the larger the fraction.
If the denominators are the same, the smaller the numerator the smaller the fraction.

Equal sized parts do not have to look the same.

Half / Quarters / Thirds

We can find a half / third / quarter of a number by sharing it into 2/3/4 equal groups.

- *To find one half of 4, you share it into 2 equal group and look at 1 equal group.*

NB The NC requires children in KS1 to find 1/3 ad 1/4 of numbers - this requires some thought as dividing by 3 and 4 is in the KS2 curriculum.)

The whole is (total). Half/ quarter/ third of (total) is (answer).

- *The whole is 10. One half of 10 is 5.*

Equivalent Fractions

Equivalent means equal value

Vocabulary

Equivalent
Numerator
Denominator
One whole
Two halves/ quarters
Third
Unit fraction
Non-unit fraction

Year 3 | Fractions

Fractions General

A whole can be divided into any number of equal parts.

When the whole is the same, the more equal parts the smaller each equal part is / the smaller the number of equal parts. the bigger each equal part is.

A non-unit fraction has a numerator greater than one.

When the numerator and denominator are the same, the fraction is equivalent to one whole.

If we know the size of a unit fraction, we can work out the whole.

All unit and non-unit fractions can be put on a number line.

Comparison

When comparing unit fractions, the greater the denominator the smaller the fraction.

When we compare fractions with the same numerator, the greater the denominator the smaller the fraction.

When we compare fractions with the same denominator, the denominator the greater the fraction.

Tenths

(number) tenth(s) is/are the same as (number) out of ten equal parts.

- *3 tenths are the same as 3 out of ten equal parts.*

Fraction of a set of objects

To find (fraction) of a set of objects, you divide the objects into (denominator) equal groups and count the amount in (numerator) equal part(s).

- *To find 1/5 of a set of objects, you divide the objects into 5 equal groups and count the amount in 1 equal part.*
- *To find ¾ of a set of objects, you divide the objects into 4 equal groups and count the amount in 3 equal parts.*

Adding / Subtracting

When the denominators are the same, add / subtract the numerators and keep the denominator the same.

To subtract from a whole, first convert the whole to a fraction where the numerator and denominator are the same.

Vocabulary

Unit fractions
Non-unit fraction
Tenths
Sixths
Sevenths
Eighths

Year 4 | Fractions & Decimals

Hundredths / Thousandths (Fractions)

(number) hundredth(s) is/are the same as (number) out of one hundred equal parts.

- *46 hundredths are the same as 46 out of one hundred equal parts.*

(number) thousandth(s) is/are the same as (number) out of one thousand equal parts.

- *321 thousandths are the same as 321 out of one thousand equal parts.*

Tenths and Hundredths (Decimals)

There are (number) ones and (number) tenths. We can write this as (decimal). (number) ones + (number) tenths = (decimal)

- *(For 3.2) There are 3 ones and 2 tenths. We can write this as 3.2. • 3 ones + 2 tenths = 3.2*

Each square is one out of ten equal squares. The coloured section is (fraction). This is (decimal).

- *Each square is one out of one ten equal squares. The coloured section is 5/10. This is 0.5*

Each square is one out of one hundred equal squares. The coloured section is *(fraction). This is (decimal).*

- *Each square is one out of one hundred equal squares. The coloured section is 15/100. This is 0.15*

(number) tenths is/are larger than (number) hundredths.

- *2 tenths are larger than 2 hundredths.*

There are (number) ones, (number) tenths and (number) hundredths. I can write this as (decimal). (number) ones + (number) tenths + (number) hundredths = (decimal)

- (For 3.21) There are 3 ones, 2 tenths and 1 hundredth. I can write this as 3.21.
- 3 ones + 2 tenths + 1 hundredth = 3.21

Improper Fractions and Mixed Numbers

Quantities made up of both whole numbers and a fractional part can be written as mixed numbers.

Mixed numbers can be written as improper fractions.

An improper fraction is a fraction where the numerator is equal to or greater than the denominator. Its value is alwasy one or greater than one.

Equivalent Fractions

When two or more fractions have the same value, we call them equivalent fractions.

Equivalent fractions go on the same place on a number line.

Dividing by 10 or 100 (Decimals)

When dividing by 10 / 100, the number is being split into 10 / 100 equal parts.

When we divide by 10/100, the number becomes 10 /100 times smaller.

When dividing by 10, we move the digits one place to the right.

When dividing by 100, we move the digits two places to the right.

Making a Whole (Decimals)

(tenths/ hundredths) + (tenths/ hundredths) = one whole.

- *0.45 + 0.55 = one whole*

Comparing Decimals

When comparing numbers, always start by comparing the highest value columns.

Rounding Decimals

This can be adapted for rounding to other decimal places.

When rounding to the nearest whole, if the tenths digit is four or less, round to the previous whole number.

If the ones digit is five or more, round to the next whole number.

(number) is closer to (number) than (number). (number) rounds to (number) when rounded to the nearest whole.

- *1.7 is closer to 2 than 1.*
- *1.7 rounds to 2 when rounded to the nearest whole number.*

Vocabulary

Hundredths
Decimal
Decimal point
Decimal place
Tenths
Hundredths
Improper fraction
Mixed number
Equivalent fractions

Year 5 | Fractions, Decimals & Percentages

Hundredths (Fractions)

(number) hundredth(s) is/are the same as (number) out of one hundred equal parts.

- *46 hundredths are the same as 46 out of one hundred equal parts.*.

Finding Common Multiples (Fractions)

(denominator) and (denominator) have a lowest common multiple of (number). The fractions can both have a denominator of (lowest common multiple).

- *For ½ and 1/5, 2 and 5 have a lowest common multiple of 10. The fractions can both have a denominator of 10.*

Improper and Mixed Number Fractions

An improper fraction is a fraction with a numerator is greater than the denominator. A mixed number contains an integer and a proper fraction.

- *In the fraction 6/5, 5 equal parts make one whole.*

Fractions to Decimals

The fraction (fraction) is the same as (decimal).

- *The fraction 15/1000 is the same as 0.015.*

Equivalent Fractions

When the numerator and denominator are multiplied or divided by the same number, the value of the fraction remains the same.

Add or Subtract Fractions

Fractions must have the same denominator before they can be added or subtracted.

To add or subtract fractions with different denominators, convert one fraction so they have the same (**common**) denominator.

Related fractions are fractions where one denominator is a multiple of the other.

Hundredths and Thousandths (Decimals)

(number) hundredths is/are larger than (number) thousandths.

- *2 hundredths are larger than 2 thousandths.*

Adding / Subtracting (Decimals)

When adding/ subtracting decimals using the formal written method, align the decimal points.

Percentages

Percentage or percent means how many parts per hundred.
Cent means hundred.

Vocabulary

Thousandths
Lowest common multiple
Percentage
Common denominator
Related fractions
Per cent %

Year 6 | Fractions, Decimals & Percentages

Simplify Fractions

To simplify a fraction, divide the numerator and denominator by their highest common factor.

Compare Fractions

To compare fractions, find a common denominator or common numerator.

Multiply or Divide Fractions

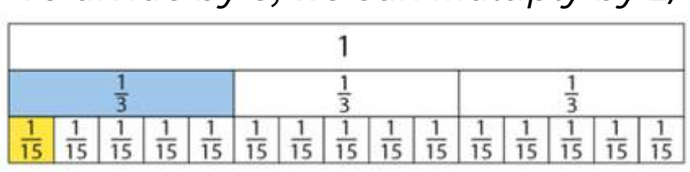
When a whole number is multiplied by a unit fraction, it makes the whole number smaller.

When multiplying unit fractions, the product is smaller than the fractions being multiplied.

When multiplying unit fractions, multiply the numerators and multiply the denominators.

To divide a fraction by a whole number, we can change ot to an equivalent multiplication.

- *To divide by 5, we can multiply by 1/5*



When a fraction is divided by a whole number it makes it smaller.

Percentages

(percentage) is equivalent to (fraction). To find (percentage) of an amount, divide by (denominator).

- *50% is equivalent to ½. To find 50% of an amount, divide by 2.*

Ratio

Ratios shows the relationship between two amounts. For every (number/ item) there are (number/ item).

- *For every 3 red cubes there are 2 yellow cubes.*

The notation of a ratio relates to the order of the parts. The ratio of (item) to (item) is (number) : (number).

- *The ratio of red counters to blue counters is 1 : 2.*

Scale Factor

(item) is (number) times as big as (item).

- *Shape A is 2 times as big as shape B.*

Vocabulary

Enlarged
Enlargement
Highest common factor
Proportion
Ratio
Scale factor
Scale factor of
Similar
Simplify

Year 1 | Shape

General

A 2D shape is a flat shape.

Naming and Recognising Shapes

This is a …
square, triangle, rectangle, circle
cuboid, cube, pyramid, sphere

I can see the (3-D shape) has a (2-D shape face).

- *I can see the cube has a square (face).*

Sorting Shapes

These shapes have been sorted by… because…
This shape will roll because…
This shape will stack because…

Patterns

The pattern is (say pattern).

- *The pattern is circle, square, triangle, circle, square, triangle.*

The core pattern is (say pattern) and then it repeats. •

- *The core pattern is circle, square, triangle and then it repeats.*

The (shape) comes before/ after (shape).

- *The circle comes before the square*

Vocabulary

Cube
Cuboid
Pyramid
Cone
Cylinder
Sphere
Face
Curved
Flat
Rectangle
Square
Circle
Triangle
2D, 3D
Sides

Year 1 | Position and Direction

Turns

This (item) has made a (quarter/ half/ three-quarter/ full) turn.

- *This shape has made a half turn.*

Position

The (item a) is (position) the (item b).

- *The box is below the table.*

Vocabulary

Turn
Quarter
Half
Three-quarter
Full
Left/ Right
Forwards / Backwards
Above / Below
Top / Bottom
In between

Year 2 | Shape

General

A vertex is where two sides meet.

2D Properties of Shapes

This is a 2-D shape. It is a (name of shape). It has (number) sides.

- *This is a 2-D shape. It is a square. It has 4 sides.*

This is a 2-D shape. It is a (name of shape). It has (number) vertices.

- *This is a 2-D shape. It is a square. It has 4 vertices.*

Symmetry

A shape is symmetrical if it can be divided into two equal parts and both parts look exactly the same.

Making Patterns

In this pattern, the (number) shape will be (shape) because...

- *In this pattern, the 10th shape will be a square because...*

3D Properties of Shapes

This is a 3-D shape. It is a (name of shape). It has (number) flat faces.

- *This is a 3-D shape. It is a cuboid. It has 6 flat faces.*
- *This is a 3-D shape. It is a cylinder It has 2 flat faces and one curved surface.*
- *This is a 3-D shape. It is a sphere. It has one curved surface.*

An edge is where two faces meet or where a face and a curved surface meet. .

- *This is a 3-D shape. It is a cube. It has 12 edges.*

Vocabulary

Pentagon
Hexagon
Sides
Vertices or vertex
Symmetry
Line of symmetry
Face
Surface
Curved surface
Edge

Year 2 | Position and Direction

Movement

The (item) has moved (number) squares (direction).

- *The car has moved 2 squares forwards.*

Clockwise is the direction the hands move on a clock.

Anti-clockwise is the opposite direction.

This (item) has made a (quarter/ half/ three-quarter/ full) turn (direction).

- *This shape has made a half turn clockwise.*

Vocabulary

Forwards
Backwards
Up
Down
Clockwise
Anti-clockwise

Year 3 | Properties of Shape

Angles

An angle is made where two lines meet at a point.

Angles are measured by the amount of turn it would take for one line to meet the other line.

A right angle is a quarter turn.
Two right angles make a half turn.
Three right angles make a three-quarter turn.
Four right angles make a full turn.

An angle that is greater than a right angle (but less than a straight line) is called an obtuse angle.

An angle that is less than a right angle is called an acute angle.

Lines

A line that runs straight from left to right is a horizontal line.

A line that runs straight up and down is a vertical line.

Parallel lines never meet, they stay the same distance apart.

Perpendicular lines meet at a right angle.

A diagonal line is a straight line that joins two vertices on a polygon.

3D and 2D Shapes

A prism is the same shape all the way through.

A polygon is a closed 2-D shape made with three or more straight sides and vertices.

This is a (3-D shape). It has (number) faces, (number) edges and (number) vertices.

- *This is a cube. It has 6 faces, 12 edges and 8 vertices.*

Vocabulary

Turn
Angle
Clockwise / Anti-clockwise
Right angle
Acute angle
Obtuse angle
Horizontal lines
Vertical lines
Diagonal ine
Parallel
Perpendicular
Prism
Polygon
Right angle triangle

Year 4 | Properties of Shape

Describing Angles

Angles are measured in degrees.

An acute angle is more than 0 degrees and less than 90 degrees.

A right angle is exactly 90 degrees.

An obtuse angle is more than 90 degrees and less than 180 degrees.

A straight line is 180 degrees.

Triangles

An equilateral triangle has three equal sides and equal internal angles.

An isosceles triangle has two equal sides and two equal internal angles.

A scalene triangle has three different length sides and three different internal angles.

A right angle-triangle is a triangle containing a right angle.

Quadrilaterals

A quadrilateral is a shape with four sides and four vertices

.A rectangle has 4 right angles and 4 straight sides. Its opposite sides are equal.

A square has 4 right angles and 4 equal straight sides.

A parallelogram has two pairs of parallel sides. Its opposite sides are equal.
Squares and rectangles are parallelograms.

A rhombus is a parallelogram with 4 equal sides. Its opposite angles are equal.
A square is a rhombus but not all rhombuses are squares.

A trapezium has one pair of parallel sides.

A kite has two pairs of equal adjacent sides.

Vocabulary

Degrees
Isosceles
Scalene
Equilateral
Right-angle triangle
Quadrilateral
Trapezium
Rhombus
Parallelogram
Kite
Adjacent

Year 4 | Position and Direction

Co-ordinates

A coordinate is a fixed point.

The x-axis is the horizontal axis.

The y-axis is the vertical axis.

Coordinates are written (x-axis, y-axis).

Read the x-axis then the y-axis.

Coordinates are plotted on the grid lines.

Translation

Translate means to move.

Shapes do not change size or shape when translated.

Translate (number) units to the (left/ right) and (number) units (up/down).

- *Translate 3 units to the left and 3 units down.*

Vocabulary

Coordinates
x-axis
y-axis
Translate

Year 5 | Properties of Shape

Angles

The turn from line a to line b is (more than/ less than) a right angle. It is an (acute/ obtuse) angle.

- *The turn from line a to line b is more than a right angle. It is an obtuse angle.*

A full turn is 360 degrees.

A reflex angle is larger than 180 degrees and smaller than 360 degrees.

Protractors

A protractor is used to measure angles.

When using a protractor, the vertex must be in the middle of the protractor.

(Note that pupils should try to measure with one line on 0 degrees but they need to understand that this is not essential.)

Regular and Irregular Shapes

If all the sides and internal angles of a shape are equal, it is a regular shape.

If the sides are not all equal and the internal angles are not all equal, the shape is irregular.

Position and Direction

Reflection

The object is the name of the shape before the reflection.
The image is the name of the shape after reflection.

Vocabulary

Reflex	**Reflection**
Protractor	**Reflect**
Regular	**Mirror line**
Irregular	**Translation**

Year 6 | Properties of Shape

Vertically Opposite Angles

Where lines intersect (cross), they create vertically opposite angles.

Vertically opposite angles are always equal.

Internal Angles in Shapes

The internal angles of a triangle always add up to 180 degrees.

The internal angles of quadrilaterals always add up to 360 degrees.

For the sum of internal angles in polygons: 180 degrees x (number of sides – 2) •

- *For a pentagon: 180 degrees x (5 – 2)*

Vocabulary

Vertically opposite

Year 1 | Measure

Length and Height

The (item) is (longer/ taller/ shorter) than the (item).

- *The blue pencil is longer than the red pencil.*

The (item) is (number) cubes long.

- *The pencil is 5 cubes long.*

The (item) is (number) cm.

- *The pencil is 7cm.*

Weight and Volume

The (item) is (heavier than/ lighter than/ equal to) the (item).

- *The cat is heavier than the book.*

The (item) weighs the same as (number) (non-standard unit of measure).

- *The ball weighs the same as 8 cubes.*

This (container) is (empty/ almost empty/ almost full/ full).

- *This cup is empty.*

This (container) has (more than/ less than) this (container).

- *This cup has more than this cup.*

If (number/ container) fill one (container), then (number/ container) will fill two (containers).

- I*f 3 cups fill one bucket, then 6 cups will fill two bucketsI*

Time

(activity) happens before/after (activity).

- *Getting dressed happens before school.*

Today is (day), yesterday was (day). / Yesterday was (day), today is (day).
Today is (day), tomorrow is (day) / Tomorrow is (day), today is (day)

- *Today is Tuesday, yesterday was Monday.*

My birthday is in (month).

The time is 6 o'clock.

The time is half past (number).

(activity) is about (number) (seconds/ minutes/ hours) long.

- *Lunch time is about 1 hour long.*

(item/ person/ time) is (faster/ slower/ earlier/ later) than (item/ person/ time).

- *Sarah is faster than Peter.*

Money

This is a (coin name). It is the same as (number of one pence coins).

- *This is a 10p coin. It is the same as 10 one pence coins.*

(number of coins/ coins) are equivalent to (total).

- *Five 1ps are equivalent to 5p.*
- *Two £5 notes are equivalent to £10.*

I can count 2ps in 2s.

I can count 5ps in 5s.

I can count 10ps in 10s.

Vocabulary

Length
Height
Taller / Shorter / Longer
Non-standard unit
cm Centimetre(s)
Ruler
Heavier / Lighter
Full / Empty
Almost full / Almost empty
More / Less
Before / After
Morning / Afternoon / Evening
First / Next / Finally
Days of the week
Months of the year
O'clock
Half past
Seconds
Minutes
Hours
Faster / Slower
Earlier / Later
Money / Coin / Note
Penny/ Pence / Pound
Price/ Cost
Spend/ spent
Buy
Pay
Total

Year 2 | Measure

Length and Height

Line up the item with 0 on the ruler.

One metre is longer than one centimetre.

1 metre is the same as 100 centimetres.

Mass

The (item) weighs (more than/ less than/ equal to) the (item) but/ and (more than/ less than/ equal to) the (item).

- *The book weighs more than the pencil but less than the bag.*

The (item) weighs (number) grams (or g).

- *The apple weighs 20g.*

The (item) weighs (number) kilograms (or kg).

- *The bag weighs 2kg.*

The (item) weighs (number)kg/g more than (item).

- *The box weighs 5g more than the bag.*

Volume and Capacity

(The capacity is the amount a container can hold.

The (container)'s capacity is (number)ml or l.

- *The cup's capacity is 20ml.*

The volume is the amount of liquid the container is actually holding. There are (number)ml/ l of (liquid).

- *There are 50ml of water.*

Temperature

The temperate is (number)oC.

The (room/ item) is (warmer/ colder) than the (room/ item).

- *The bedroom is hotter than the kitchen.*

The difference between the temperature in the (room/ item) and the (room/ item) is (number) degrees Celsius.

Time

The time is (quarter past/ to) (hour).

- *The time is quarter past 9.*

The time is (minutes) (past/to) (hour).

- *The time is 5 minutes past 9.*

There are 24 hours in a day.

There are 60 minutes in an hour.

Money

I can count £1 coins in 1s.

I can count £2 coins in 2s.

I can count £5 notes in 5s.

I can count £10 notes in 10s.

I can count £20 notes in 20s.

(number/ coins) = (total)

- *Three 10p coins = 30p*

(number/ coins or notes) + (number/ coins or notes) = (total pounds) (total pence)

- *Three 10p coins + two 2p coins = 34p •*
- *Two £5 notes + 2p = £5 and 2p*

I can make (total) using (number/ coins).

- *I can make 20p using two 10ps.*

(total) is more than/ less than (total).
(total) is greater than/ less than (total).

- *£2 and 50p is more than/ greater than 50p*

The change is how much is left after spending money.

(total coins/ notes) – (total) = (change)

- *50p – 20p = 30p*

Vocabulary

Metre
Longer/ Longest
Shorter / Shortest
Mass
Grams
Kilograms
Millilitres (ml)
Litres (l)
Temperature / Degrees Celsius (oC)
Increase / Decrease
Colder / Warmer
Past / To
Quarter to / Quarter past
Duration
Change Buy/ Bought
Sell/ Sold
Compare
Comparison
More/ Less
More than / Greater than / Less than
Greatest/ Least

Year 3 | Measure

Length (converting cm and m)

Note that pupils will not be introduced to decimals at this point.

Centi- as a prefix means hundred.

To convert from metres to centimetres, multiply by 100.
When multiplying by 100, the digits move two places to the left.

To convert from centimetres to metres, divide by 100.
When dividing by 100, the digits move two places to the right.

Converting mm and cm

Milli- as a prefix means thousand.

To convert from centimetres to millimetres, multiply by 10.
When multiplying by 10, the digits move one place to the left.

To convert from millimetres to centimetres, divide by 10.
When dividing by 10, the digits move one place to the right.

Perimeter

The perimeter is the distance around a 2-D shape.

(number) (unit of measure) + (number) (unit of measure) + … (etc) = (number) (unit of measure)

- *5cm + 5cm + 5cm + 5cm = 20cm*

Mass

I estimate this (item) has a mass of (number/ unit of measure).

- *I estimate this book has a mass of 20g.*

The (item) weighs (number)kg and (number)g.

- *The box weighs 1kg and 500g.*

Capacity

The scale increases in increments of (number/ unit).

- *The scale increases in increments of 10ml.*

The capacity of the container is (number/ unit). The volume of the liquid is (number/ unit).

- *The capacity of the container is 1l. The volume of the liquid is 300ml.*

The volume/ capacity is (number)l and (number)ml.

- *The volume is 2l and 720ml*

Time

There are 365 in a year.
There are 366 days in a leap year.

There are 12 months in a year.

There are 7 days in a week.

There are 5 days in a school/ work week.

There are 60 seconds in a minute.

Time

(list of coins) make a total of (total).

- *50p and 20p and 10p make a total of 80p*

(pence) is equal to (pounds and pence).

- *125p is equal to £1 and 25p (pounds and pence) +*

(pounds and pence) = (total)

- *£5 and 20p + £2 and 30p = £7 and 50p*
-

Vocabulary

Millimetre(s)
Perimeter
Estimate
Leap year
a.m. p.m. 24-hour

Year 4 | Measure

Length (converting m and km)

Kilo- as a prefix means thousand.

To convert from kilometres to metres, multiply by 1,000.
When multiplying by 1,000, the digits move three places to the left.

To convert from metres to kilometres, divide by 1,000.
When dividing by 1,000, the digits move three places to the right.

Area

The area is the size of the surface of a 2-D shape.

There are (number) squares in each row. There are (number) rows. (number) rows of (number) squares = (number) squares. The area is (number) squares.

- *There are 2 squares in each row. There are 3 rows. 3 rows of 2 squares = 6 squares. The area is 6 squares.*

Time

(month) has (number of days) days.

- *January has 31 days.*

The time is (minutes, to/past, hour). We can also write this as (12 hour or 24 hour digital time).

- *The time is 25 minutes past 3. We can also write this as 3:25 p.m.*

Money

There is (number) pounds. There is (number) pence. This is a total of (pounds) and (pence). This is the same as (pounds and pence total).
There is 2 pounds. There is 35 pence. This is a total of £2 and 35p. This is the same as £2.35

(pounds and pence) is equivalent to (pounds).

- *£2 and 35p is equivalent to £2.35*

Time

(list of coins) make a total of (total).

- *50p and 20p and 10p make a total of 80p*

(pence) is equal to (pounds and pence).

- *125p is equal to £1 and 25p (pounds and pence) +*

(pounds and pence) = (total)

- *£5 and 20p + £2 and 30p = £7 and 50p*

Vocabulary

Kilometre
Convert
Equivalent
Kilo- (prefix)
Right angle
Rectilinear shape
Area
Digital / Analogue

Year 5 | Measure

Area

For rectangles, the area of a shape is calculated by multiplying the length by the width.

Area is measured in units squared or unit².

Metric Measures

Metric units of measure use the base language of ‘metre’, ‘litre’ and ‘gram’.

Converting Units

There are (number) grams in (number) kilograms.

There are (number) metres in (number) kilometres.

- *There are 1,000 grams in 1 kilogram.*

To convert from (unit of measure) to (unit of measure), (multiply/ divide) by (number).

- *To convert from metres to millimetres, multiply by 1,000.*

Converting between Imperial and Metric

1 inch is approximately 2.5cm. 1 inch ≈ 2.5cm

1 kilogram is approximately 2 pounds. 1kg ≈ 2lbs

There are 568 millilitres in a pint. 568ml = 1 pint.

Converting Units of Time

1 year = 12 months
1 year = 365(.25) days
1 week = 7 days
1 day = 24 hours
1 hour = 60 minutes
1 minute = 60 seconds

Volume

Volume is the amount of solid space a 3-D object takes up.

Volume is measured in units cubed or unit³.

Vocabulary

Kilograms
Milligrams
Millilitres
Metric
Imperial
Timetable

Year 6 | Measure

Converting between Imperial and Metric

5 miles is approximately 8 kilometres. 5 miles ≈ 8km

Imperial

1 foot is 12 inches.
1 pound is 16 ounces. 1lb = 16oz
1 stone is 14 pounds. 1 stone = 14lbs
1 gallon is 8 pints. 1 gallon = 8 pints

Area

Area of a triangle = base x height ÷ 2

Area of a parallelogram = base x perpendicular height

Volume

Volume of a cuboid = length x width x height

Vocabulary

Miles
Foot
Pound
Ounces
Stone
Gallon
Pint