

EYFS Counting Principles

Counting is often something that we take for granted or assume that children can do when we hear them recite numbers but there are 5 key principles that children need to understand in order to be able to count. These principles underpin much of our early teaching of number in school.

1) The one-to-one principle

This involves children assigning each object in a group one number name. Children need to make sure they count each object only once and need to ensure they have counted every object.

2) The stable-order principle

Children understand when counting that the numbers have to be said in a certain order.

3) The cardinal principle

Children understand that the number name they give to the final object in the group is the total number of objects in that group. This means they recognise that if they count a group of objects and give the final object the name 4 then there are 4 objects in that group.

4) The abstraction principle

This involves children understanding that anything can be counted not just things they can touch so they can also count noises, jumps, skips, etc.

5) The order-irrelevance principle

This involves children recognising that it does not matter which order they count the objects in there will still be the same amount if they count each object once.



Pre School Maths

Throughout their time at Pips pre-school children will learn the following mathematical knowledge and skills.

Develop fast recognition of up to 3 objects without having to count them (subitising)	Compare quantities using language (more than, less than)	Combine shapes to make new ones
Recite numbers past 10	Talk about and explore 2-D and 3-D shapes using informal and mathematical language	Talk about and identify the patterns around them
Say one number for each item in order	Understand position through words alone without the need for pointing	Extend and create ABAB patterns
Know that the last number reached when counting a whole set of objects tells you how many there are in total	Describe a familiar route	Notice and correct an error in a repeating pattern
Link numerals to amounts	Discuss routes and locations, using words like 'in front of' and 'behind'	Begin to describe a sequence of events, real or fictional
Experiment with their own symbols and marks as well as numerals	Make comparisons between objects relating to size, length, weight and capacity.	Count objects, actions and sounds.
Solve real world mathematical problems with numbers up to 5	Select shapes appropriately for different purposes	



Maths River Map- Pre School



Learn new mathematical vocabulary including number names, comparative words such as more or less and operation words such as add and subtract.



Communication and Language

Articulate their ideas in whole sentences using the sentence openers 'I know...' and 'I think...'

Use talk to solve problems particularly through sharing ideas with a partner.

Learn mathematical poems and rhymes such as 'One, Two, Three, Four, Five, once I caught a fish alive.'



Personal, Social and Emotional Development

Understand that other people might have used a different method to get the answer and recognise that they can both be correct.

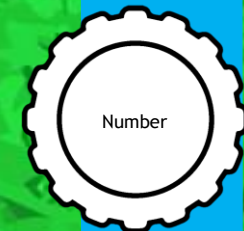
Show resilience when the learning is tricky and persevere to find the correct answer.

Subitise up to 5 (recognise how many objects are in a group without having to count individually such as when looking at a dice)

Count objects, actions and sounds.

Link numbers and quantities (such as counting the number of hearts on a playing card and linking to the number shown).

Count beyond 10 and 20.



Number

Compare numbers using the language of more than, less than and equal to or the same as.

Know all number bonds to 5 and some number bonds to 10.

Fully understand how numbers to 5 and then to 10 are made up (e.g. 3 and 3 makes 6 so if he has 3 sweets and she has 3 sweets they have 6 altogether)

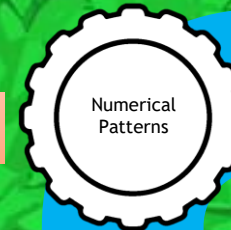
Understand the concept of one more and one less.

Explore which numbers can be shared equally.

Verbally count beyond 20.

Explore and represent patterns with numbers up to 10 including odd and even numbers.

Recognise the pattern of numbers (e.g. 25 is 20 and 5, 32 must come after 31 because 2 comes after 1)



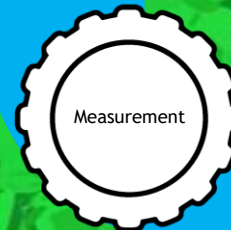
Numerical Patterns

Compare quantities up to 10 in different contexts (e.g. if your group has 3 people and their group has 6 people who has more?).

Find doubles of numbers up to 5.

Make and test predictions (e.g. which do you think holds more the jug or the cup?)

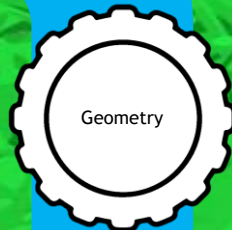
Compare length, weight and capacity.



Measurement

Select, rotate and manipulate shapes (e.g. copying patterns or shapes made by others)

Continue, copy and create repeating patterns



Geometry

Investigate how shapes can be combined to make other shapes (e.g. two triangles make a square)

Use the language of bigger than, less than, longer than, shorter than, heavier than, lighter than



Maths River Map- EYFS



Learn new mathematical vocabulary including number names, comparative words such as more or less and operation words such as add and subtract.



Communication and Language

Articulate their ideas in whole sentences using the sentence openers 'I know...' and 'I think...'

Use talk to solve problems particularly through sharing ideas with a partner.

Learn mathematical poems and rhymes such as 'One, Two, Three, Four, Five, once I caught a fish alive.'



Personal, Social and Emotional Development

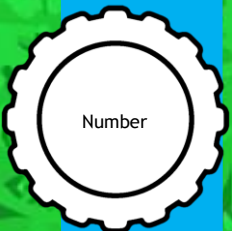
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Show resilience when the learning is tricky and persevere to find the correct answer.

Subitise up to 5 (recognise how many objects are in a group without having to count individually such as when looking at a dice)

Count objects, actions and sounds.

Link numbers and quantities (such as counting the number of hearts on a playing card and linking to the number shown).



Number

Count beyond 10 and 20.

Compare numbers using the language of more than, less than and equal to or the same as.

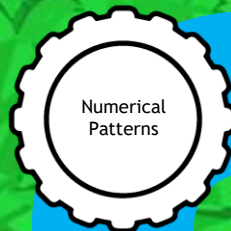
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Fully understand how numbers to 5 and then to 10 are made up (e.g. 3 and 3 makes 6 so if he has 3 sweets and she has 3 sweets they have 6 altogether)

Understand the concept of one more and one less.

Explore which numbers can be shared equally.

Verbally count beyond 20.



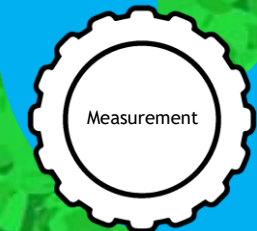
Numerical Patterns

Recognise the pattern of numbers (e.g. 25 is 20 and 5, 32 must come after 31 because 2 comes after 1)

Explore and represent patterns with numbers up to 10 including odd and even numbers.

Compare quantities up to 10 in different contexts (e.g. if your group has 3 people and their group has 6 people who has more?).

Find doubles of numbers up to 5.

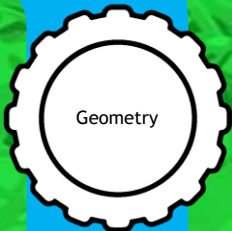


Measurement

Compare length, weight and capacity.

Make and test predictions (e.g. which do you think holds more the jug or the cup?)

Select, rotate and manipulate shapes (e.g. copying patterns or shapes made by others)



Geometry

Continue, copy and create repeating patterns

Investigate how shapes can be combined to make other shapes (e.g. two triangles make a square)



Maths River Map- Year 1



Count to and across 100, forwards and backwards, from any given number.

Count, read and write numbers to 100 in numerals.

Identify one more and one less than a given number.

Use the language or equal to, more than, less than, most and least.

Read and write numbers to 20 in words.

Identify and represent numbers in a range of different ways.

Count in steps of 2, 5 and 10.

With the support of the teacher and a range of manipulatives, solve one-step problems.

Multiplication and division

Read, write and interpret mathematical statements involving addition, subtraction and equals signs.

Represent and use number bonds to 20 and their related subtraction facts.

Addition and Subtraction

Solve one step problems including missing number problems.

Add and subtract one-digit and two-digit numbers to 20, including 0.

Understand that halves and quarters have to consist of equal parts.

Recognise, find and name a quarter.

Fractions

Recognise, find and name a half.

Measure and begin to record lengths, mass, capacity, volume and time.

Use the language of longer/shorter, heavier/lighter, full/empty, quicker/slower.

Compare, describe and solve practical problems for length, height, mass, capacity and time.

Tell the time to the nearest hour and half hour.

Recognise and know the value of different coins and notes.

Sequence events in chronological order.

Recognise and use language relating to dates such as days of the week and months of the year.

Describe position, direction and movement using language such as full turn, half turn, quarter/three-quarter turn, left, right, forwards, backwards

Recognise and name common 3-D shapes (including cuboids, pyramids and spheres)

Geometry

Recognise and name common 2-D shapes (including squares, rectangles, circles and triangles)

Love

Equality

Friendship

Forgiveness

Trust



Maths River Map- Year 2

Ask and answer simple questions about graphs and tables.

Write simple fractions (e.g. $\frac{1}{2}$ of 6 = 3)

Recognise the equivalence of $\frac{1}{2}$ and $\frac{2}{4}$.

Identify and describe the properties of 2-D shapes (e.g. number of sides).

Identify the 2-D shapes that are on the surface of 3-D shapes.

Compare and sort common 2-D and 3-D shapes.

Identify and describe the properties of 3-D shapes (e.g. number of faces, number of vertices).

Create patterns and sequences.

Compare and sequence intervals of time.

Tell the time to the nearest 5 minutes.

Know there are 60 minutes in an hour and 24 hours in a day.

Recognise the symbols for pounds and pence.

Compare and order measurements using <, > and =

Choose and use appropriate standard units (e.g. cm and m) to estimate and measure.

Combine coins and notes to make a particular value of money.

Solve practical money problems and calculate change.

Recognise that multiplication can be done in any order but division cannot.

Solve problems involving multiplication and division.

Write multiplication and division statements using the correct symbols ($\times$ $\div$ =)

Draw and use arrays.

Recall and use 2, 5 and 10 times table facts.

Add and subtract with 2-digit numbers.

Add three one-digit numbers

Recognise that addition can be done in any order but division cannot.

Interpret and construct pictograms, tally charts, block diagrams and tables.

Count in steps of 10 forwards and backwards from any number.

Recognise the place value of each digit in a 2-digit number (e.g. 36 is made up of 3 tens and 6 ones.)

Compare and order numbers up to 100.

Use the <, > and = signs to compare numbers.

Identify and represent numbers in a range of different ways, including on a number line.

Derive addition and subtraction facts to 100.

Use the inverse (opposite) relationship between addition and subtraction to check answers and to solve missing number problems.

Count in steps of 2, 3 and 5 from 0.

Number and Place Value

Statistics

Fractions

Recognise, find and name $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of lengths, shapes and quantities.

Geometry

Measurement

Multiplication and division

Addition and Subtraction

Love

Equality

Friendship

Forgiveness

Trust



Maths River Map- Year 3



Number
and
Place
Value

Count in steps of 4, 8 50 and 100 from 0.

Find 10 and 100 more or less than any given number.

Recognise the place value of each digit in a 3-digit number (e.g. 365 is made up of 3 hundreds, 6 tens and 5 ones. .

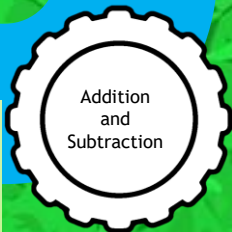
Compare and order numbers up to 1000.

Read and write numbers to at least 1000 in numerals and words.

Identify and represent numbers in a range of different ways, including on a number line.

Use mental methods to add and subtract ones, tens or hundreds from a 3-digit number.

Use formal written methods such as the column method to add and subtract numbers with up to 3-digits.



Addition
and
Subtraction

Estimate the answer to a calculation.

Solve addition and subtraction problems including those with missing numbers.

Use inverse operations to check answers.

Calculate the answers to multiplication questions involving 2-digit numbers multiplied by 1-digit numbers.

Solve problems involving one and two steps (e.g. how many more chose ___ than ___)

Interpret and present data using bar charts, pictograms and tables.



Statistics

Use different scales when drawing bar charts.

Use the times tables facts they already know to solve multiplication problems.



Multiplication
and
division

Recall and use 3, 4 and 8 times table facts.

Recognise that tenths come from dividing into 10 equal parts.

Recognise, find and write fractions of a set of objects.



Fractions

Know the difference between unit fractions and non-unit fractions.

Count up and down in tenths.

Compare and order fractions with the same numerator or the same denominator.

Find and show fractions that are equivalent fractions

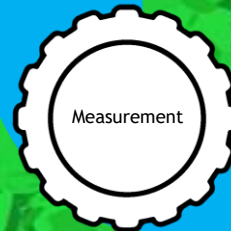
Add and subtract fractions with the same denominator.
(e.g. $\frac{4}{7} + \frac{2}{7} = \frac{6}{7}$)

Tell and write the time using 12 and 24 hour clocks.

Add and subtract amounts of money to give change.

Measure the perimeter of simple 2-D shapes.

Measure, compare, add and subtract: lengths (m/cm/mm), mass (kg/g) and volume/capacity (l/ml).



Measurement

Tell the time to the nearest minute.

Use time vocabulary including: o'clock, a.m., p.m., morning, afternoon, noon and midnight.

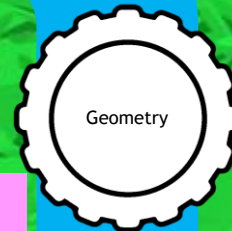
Know the number of days in each month of the year.

Compare the amount of time different events take.

Identify horizontal and vertical lines.

Identify if angles are greater or less than a right angle.

Recognise the angles in a shape including right angles.



Geometry

Identify pairs of parallel and perpendicular lines.

Draw 2-D shapes and make 3-D shapes.



Maths River Map- Year 4



Count in multiples of 6, 7, 9, 25 and 1000.

Find 1000 more or less than any given number.

Recognise the place value of each digit in a 4-digit number (e.g. 5365 is made up of 5 thousands, 3 hundreds, 6 tens and 5 ones.

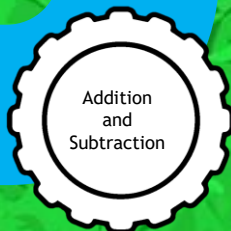
Count backwards through 0 to include negative numbers.

Order and compare numbers beyond 1000..

Round any number to the nearest 10, 100 or 1000.

Solve addition and subtraction problems with two steps.

Use formal written methods such as the column method to add and subtract numbers with up to 4-digits.



Estimate the answer to a calculation.

Interpret and present data in different ways including in bar charts and time graphs.

Know the difference between discrete and continuous data.



Solve comparison, sum and difference problems using the data in a chart or graph.



Multiply mentally by 1 and 0.

Recall times tables facts up to 12X12.

Use formal written methods to multiply 2-digit or 3-digit numbers by 1-digit numbers.

Use inverse operations to check answers.



Recognise that hundredths come from dividing an object into 100 equal pieces.

Count up and down by hundredths.

Recognise and show groups of equivalent fractions.

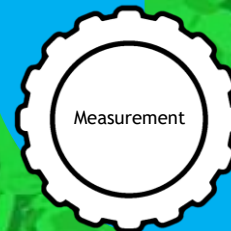
Divide numbers by 10 and 100 where the answer is a decimal

Estimate, compare and calculate different measurements.

Find the area of shapes by counting squares.

Measure and calculate the area of rectangles and rectilinear shapes.

Convert between different units of measure (e.g. cm to m, hours to minutes).



Compare numbers with up to two decimal places.

Recognise and write the decimal equivalents of any number of tenths or hundredths.

Recognise and write the decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$

Divide numbers by 10 and 100 where the answer is a decimal

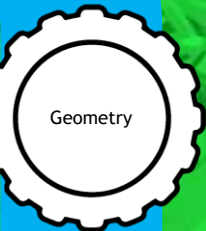
Read, write and convert time between analogue and digital clocks.

Use grid references to describe positions on a grid.

Complete shapes by reflecting in a line of symmetry.

Identify lines of symmetry in 2-D shapes.

Identify acute and obtuse angles.



Plot specified points on a grid and draw in sides to complete a given shape.

Compare and classify shapes including quadrilaterals and triangles.

Solve problems involving converting from hours to minutes, minutes to seconds, years to months and weeks to days.



Maths River Map- Year 5



Read, write, order and compare numbers to at least 1 million.

Count forwards or backwards in any multiple of 10 (e.g. 100, 10000) from an ygiven number.

Count forwards and backwards in positive and negative numbers.

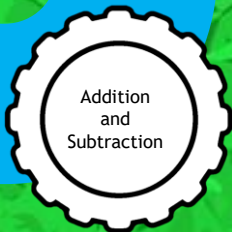
Round any number up to 1000000 to the nearest 10, 100, 1000, 10000 and 100000.

Read Roman numerals to 1000.

Recognise years written in Roman numerals.

Solve multi-step problems.

Use formal written methods such as the column method to add and subtract numbers with more than 4 digits.



Add and subtract mentally with increasingly large numbers
(e.g. $12462 - 2300 = 10162$)

Read and interpret tables and timetables.

Use given information to complete tables and timetables.

Multiply numbers up to 4-digits by 1 and 2 digit numbers.

Identify multiples and factors. .

Find all of the factor pairs of a number (e.g. the factor pairs of 8 are 1 and 8, 2 and 4)

Use rounding to check answers to a calculation.



Solve comparison, sum and difference problems using the data in a line graph.

Convert between mixed numbers and improper fractions.

Recognise mixed numbers and improper fractions.

Identify, name and write equivalent fractions.

Compare and order fractions with common denominators.

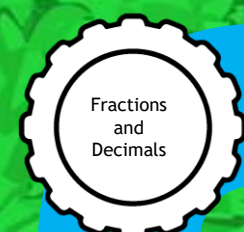
Divide numbers using short division.

Recognise and use square and cubed numbers.

Multiply and divide numbers by 10, 100 and 1000



Know and use the vocabulary of prime numbers.



Round numbers with two decimal places.

Add and subtract fractions with common denominators.

Multiply fractions and mixed numbers by whole numbers.

Read and write decimal numbers as fractions.

Recognise and use thousandths.

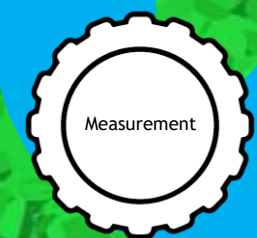
Read, write, order and compare numbers with up to 2 decimal places.

Write percentages as fractions.

Measure and calculate the perimeter of increasingly complex shapes.

Understand what imperial measurements are.

Convert between different units of measure (e.g. cm to m, hours to minutes).



Calculate and compare the area of rectangles.

Estimate volume and capacity.

Use approximate equivalences to convert between metric and imperial units.

Translate and reflect shapes.

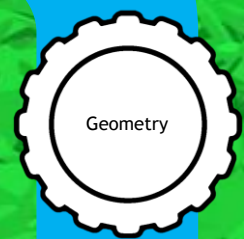
Know that angles around a point total 360° and angles on a straight line total 180°

Draw given angles and measure them in degrees.

Know angles are measured in degrees.

Know the difference between irregular and regular shapes.

Use knowledge of rectangles to find missing lengths and angles.



Identify 3-D shapes from their nets.



Maths River Map- Year 6



Read, write, order and compare numbers to at least 10 million.

Know the value of each digit in numbers up to 10 million. (e.g. in the number 564789 the value of the 4 is 4 thousand).

Round any whole number

Use negative numbers in context (e.g. know that the temperature has dropped by 7 degrees if it has gone from 3 to -4)

Use formal written methods for addition and subtraction with numbers up to 1 million.

Use rounding to check answers to a calculation.

Use estimation to check answers.

Use long multiplication effectively.

Solve multi-step problems that involve more than one operation (addition, subtraction, multiplication, division).

Show remainders from division as whole numbers, fractions or decimals.

Identify common multiples and common factors.

Identify prime numbers.

Use BODMAS

Divide numbers up to 4 digits by a 2-digit number.



Understand how to calculate the average as a mean.

Interpret and construct pie charts.

Solve problems involving percentages (e.g. What is 15% of 360?)

Solve problems using multiplication facts (e.g. if I need 8 eggs to make the recipe for 4 people how many do I need to make the recipe for 2 people?)



Use scaling to solve shape problems (e.g. if this triangles was 3 times as large how long would the base be?)

Solve problems using knowledge of fractions (e.g. if there are 25 children in a class and $\frac{3}{5}$ are boys how many are girls?)

Use simple formulae.



Compare and order fractions with common denominators.

Use algebra to express missing number problems (e.g. $x + 3 = 5$ so $x = 2$)

Generate and describe number sequences.

Add and subtract fractions with different denominators.

Compare and order fractions, including those greater than 1.

Simplify fractions.

Multiply fractions.

Divide fractions by whole numbers (e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$)



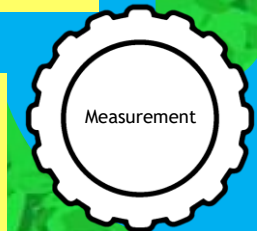
Divide numbers by 10, 100 and 1000

Multiply decimal numbers by a whole number.

Use short division to answer questions where the answer has up to 2 decimal places.

Calculate the area of parallelograms and triangles.

Calculate, estimate and compare volume.



Convert between miles and kilometres.

Use, read, write and convert between metric units of measure.

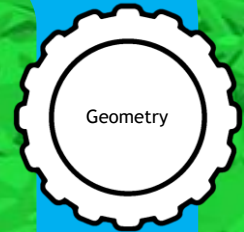
Compare and classify 2-D shapes.

Recognise, describe and build 3-D shapes.

Draw 2-D shapes using given measurements.

Draw, translate and reflect shapes on a grid.

Describe positions using all 4 quadrants on a grid.



Find unknown angles in 2-D shapes.

Know the parts of a circle (radius, diameter and circumference)

