

The Maths Curriculum Pathway The Tilstock Way

'Pure mathematics is, in its way, the poetry of logical ideas.'

Albert Einstein,

Maths at our school aims to ensure that all our children become fluent in the fundamental of maths, reason mathematically and can solve problems.

Fluency – We know that our children must know their number bonds, times tables and place value securely to provide them with the key knowledge to enable them to work mathematically. We have regular 'maths skills' sessions using *Target Your Maths* to instil this learning into their long term memories. We use online learning platforms such as *NumBots* and *Times-table Rockstars* to allow children regular time to practice and secure the fundamentals of maths.

Reasoning- This is an essential part of the daily maths lesson. Children are encouraged to talk about and discuss how they are going to work something out, to unearth the deeper learning and thinking mathematically. Children are encouraged to answer questions such as 'What do you notice?' 'How could you begin solving this question?' 'What are the key features?' This is also an opportunity to develop and use mathematical vocabulary. We use *White Rose Maths* as a consistent framework across the school to develop reasoning skills.

Problem Solving – This is a vital strand of our maths curriculum as an opportunity for children to transfer their understanding to new concepts. As well as linking maths to cross-curriculum subjects in real-life contexts, we use Nrich and NCETM materials to expose our children to a range of mathematical problems.

Milestones – March 2021

The attached pathways show the Maths Milestones for each year group. This has been derived from the DfE publication: ***Mathematics guidance: key stages 1 and 2 Non-statutory guidance for the national curriculum in England June 2020.***

The pathways identify the most important conceptual knowledge and understanding that pupils need as they progress from year 1 to year 6. These important concepts are referred to as ready-to-progress criteria and provide a coherent, linked framework to support pupils' mastery of the primary mathematics curriculum.

The DfE recommends the use of these at the long-term planning stage, (to ensure that the most important elements that underpin the curriculum are covered at the right time, and to ensure that there is continuity and consistency for pupils as they progress from one year group to the next), and at the medium-term planning stage, (to inform decisions on how much teaching time to set aside for the different parts of the curriculum) therefore teaching time can be weighted towards the ready-to-progress criteria.

We feel that in the current circumstances we need to ensure that all children are secure in the most important conceptual knowledge and understanding to enable them to progress into the next year group.

In light blue you will find descriptors for what children should know before they learn the age related expectations (ready to progress criteria) as defined in black. They contain abbreviated

Ready-to-progress criteria strands	Code
Number and place value	NPV
Number facts	NF
Addition and subtraction	AS
Multiplication and division	MD
Fractions	F
Geometry	G

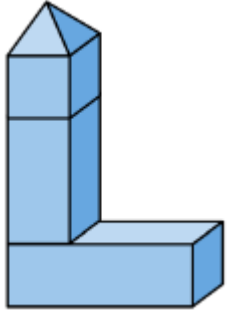
Year 1 Maths Milestones



Number

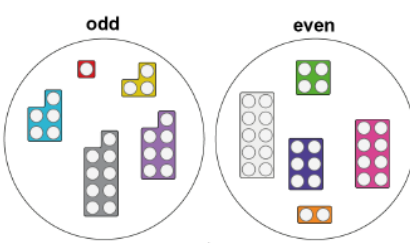
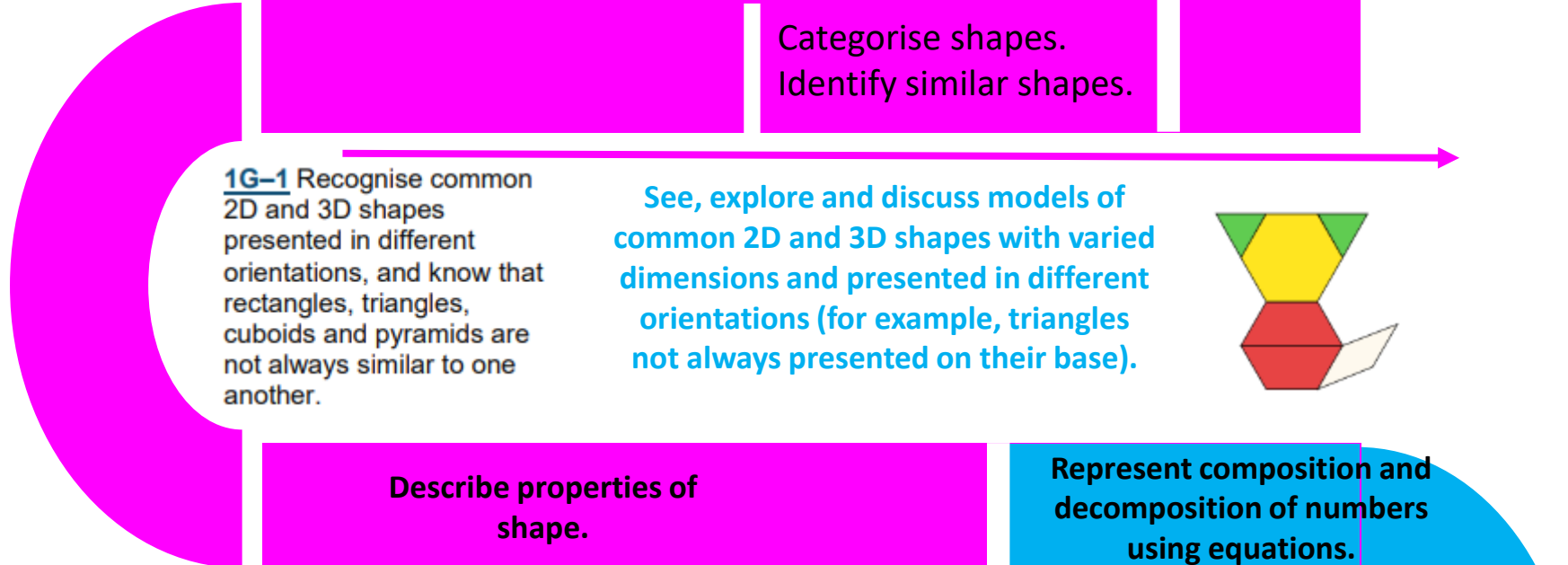
Addition/Subtraction

Shape, space & measure

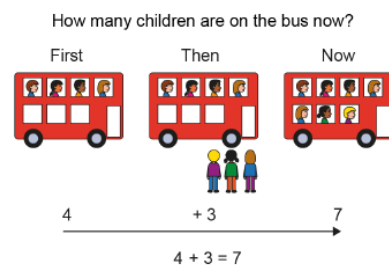


Select, rotate and manipulate shapes for a particular purpose, for example:
 rotating a cylinder so it can be used to build a tower
 rotating a puzzle piece to fit in its place

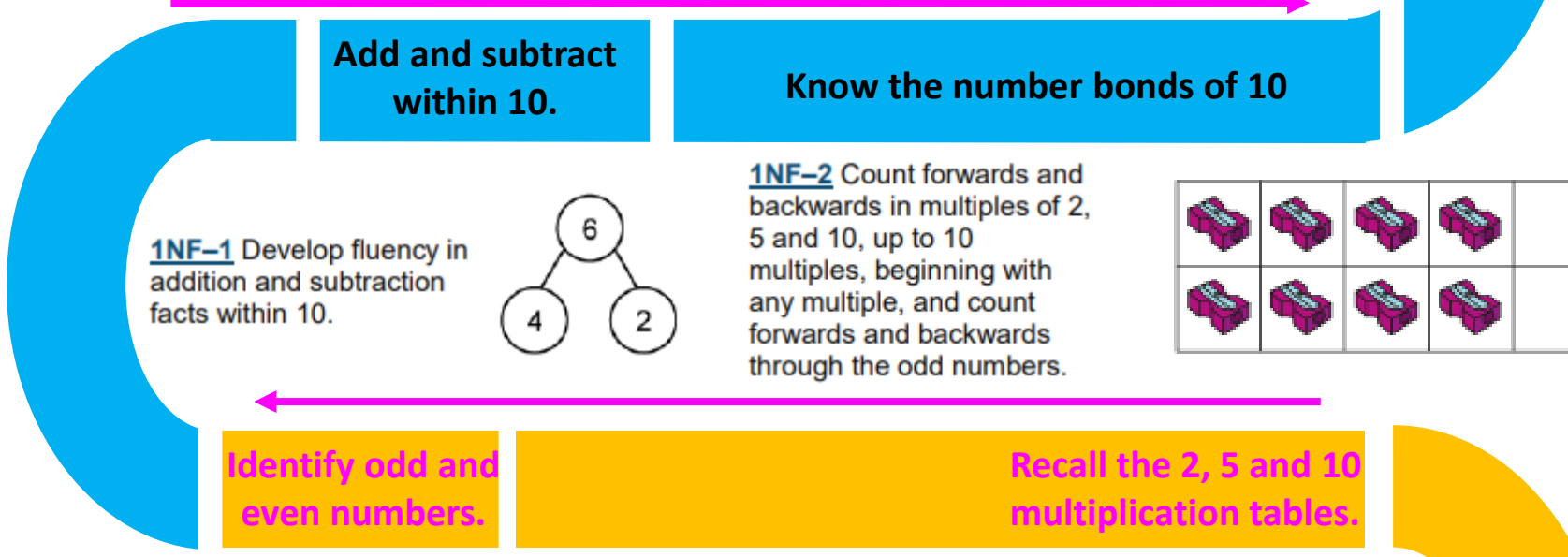
1G-2 Compose 2D and 3D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations.



1AS-1 Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers.



1AS-2 Read, write and interpret equations containing addition (+), subtraction (-) and equals (=) symbols, and relate additive expressions and equations to real-life contexts.



I subitise for up to 5 items. I automatically show a given number using fingers.

I begin to experience partitioning and combining numbers within 10.

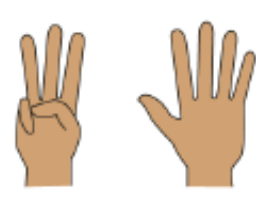
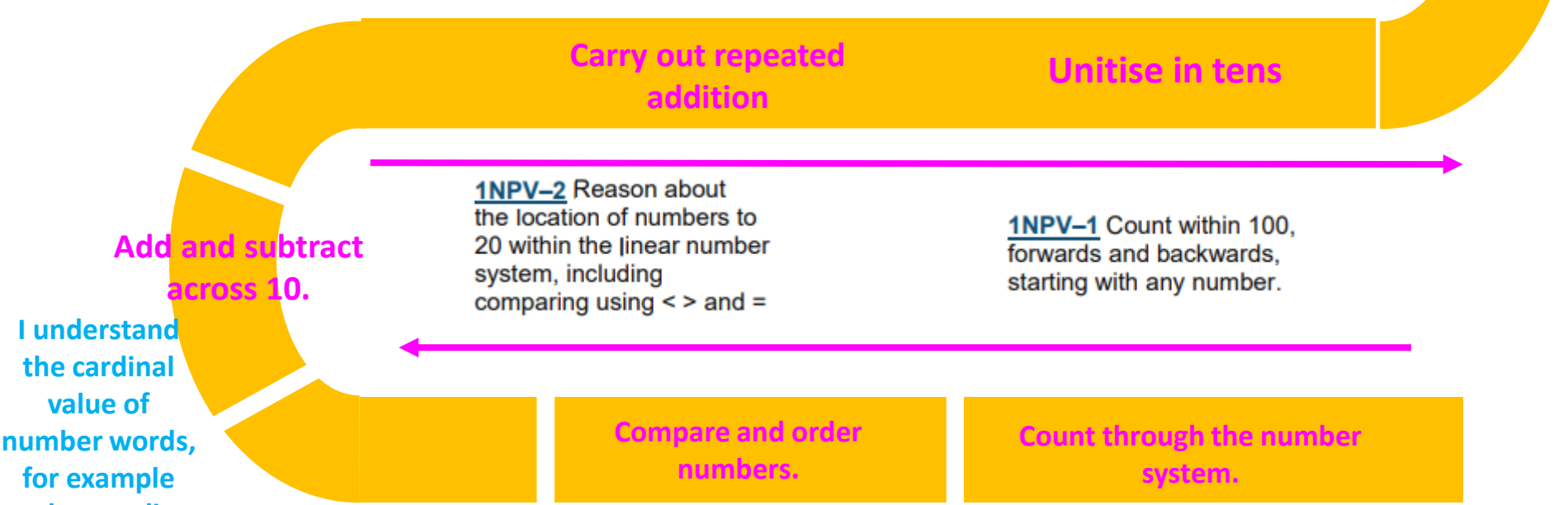


Figure 17: 8 represented as 3 fingers and 5 fingers

I distribute items fairly, for example, put 3 marbles in each bag, recognising when items are distributed unfairly.



Year 2 Maths Milestones



Number and place value
Number facts

**Addition/
Subtraction**

**Shape, space &
measure**

I recognise common 2D and 3D shapes presented in different orientations.

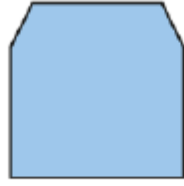


Figure 55: an irregular hexagon

2G-1 Use precise language to describe the properties of 2D and 3D shapes, and compare shapes by reasoning about similarities and differences in properties.

Describe 2D and 3D shapes

2MD-2 Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotitive division).

2MD-1 Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2, 5 and 10 multiplication tables.

2AS-4 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract any 2 two-digit numbers.

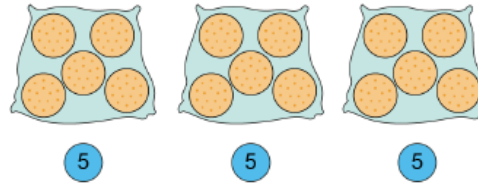
Recognise repeated addition .

Add and subtract any 2 digit number



Figure 52: recognising equal groups – 3 groups of 5 eggs

I can count in multiples of 2, 5 and 10.

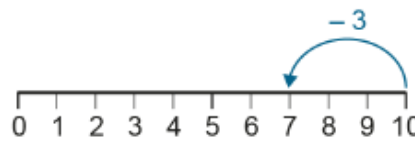


I know that a multiple of 10 is made up from a number of tens, for example, 50 is 5 tens.

Add and subtract across 10

Recognise the subtraction structure of difference

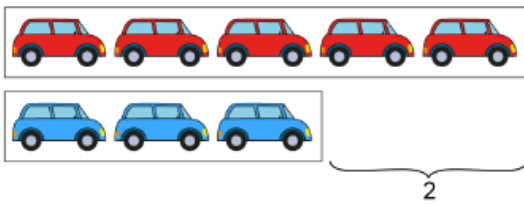
2AS-1 Add and subtract across 10, for example:
 $8 + 5 = 13$
 $13 - 5 = 8$



2AS-2 Recognise the subtraction structure of 'difference' and answer questions of the form, "How many more...?".

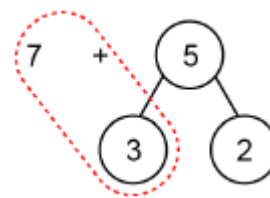
2AS-3 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract only ones or only tens to/from a two-digit number.

Solve contextual subtraction problems for all three subtraction structures.



Solve missing addend problems within 10, for example:
 $4 + ? = 10$

I partition numbers within 10, for example:
 $5 = 2 + 3$



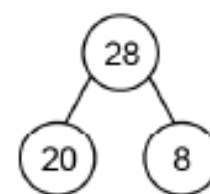
I have learnt and use number bonds to 10, for example:
 $8 + ? = 10$

Add and subtract within 10

Add and subtract within 100

2NF-1 Secure fluency in addition and subtraction facts within 10, through continued practice.

2NPV-2 Reason about the location of any two-digit number in the linear number system, including identifying the previous and next multiple of 10.



2NPV-1 Recognise the place value of each digit in two-digit numbers, and compose and decompose two-digit numbers using standard and non-standard partitioning.

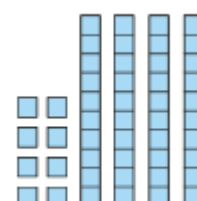
Fluent in addition and subtraction facts within 10 .

Recognise the value of each digit in 2 digit numbers

I have developed fluency in addition and subtraction facts within 10.

I can count forwards and backwards to and from 100.

I can place the numbers 1 to 9 on a marked, but unlabelled, 0 to 10 number line.



I know that 10 ones are equivalent to 1 ten.

Year 3 Maths Milestones



Number and place value Number facts

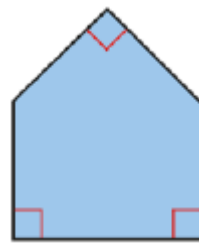
Addition/ Subtraction

Shape, space & measure

I recognise standard and non-standard examples of 2D shapes presented in different orientations.

I identify similar shapes.

3G-1 Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations.



I compose 2D shapes from smaller shapes to match an exemplar, rotating and turning over shapes to place them in specific orientations.

3F-4 Add and subtract fractions with the same denominator, within 1.

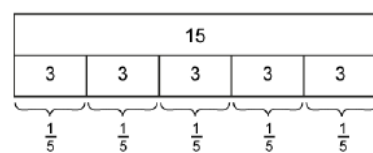
Identify right angles

Draw polygons

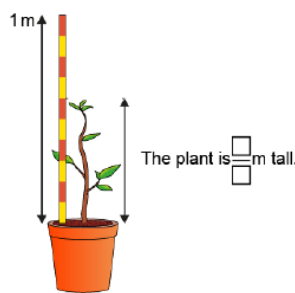
3G-2 Draw polygons by joining marked points, and identify parallel and perpendicular sides.

3F-3 Reason about the location of any fraction within 1 in the linear number system.

3F-2 Find unit fractions of quantities using known division facts (multiplication tables fluency).



3F-1 Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts.



3MD-1 Apply known multiplication and division facts to solve contextual problems with different structures, including quotitive and partitive division.

I recognise repeated addition contexts and represent them with multiplication equations.

Add and subtract fractions

Interpret and write proper fractions

I recall addition and subtraction facts within 10 and across 10.

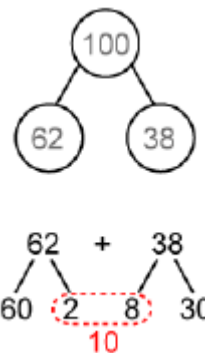
I recognise the place value of each digit in two- and three-digit numbers.

3AS-2 Add and subtract up to three-digit numbers using columnar methods.

Write equations to represent addition and subtraction contexts.

3AS-3 Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction,

I can add and subtract up to 3 digit numbers using columnar methods .



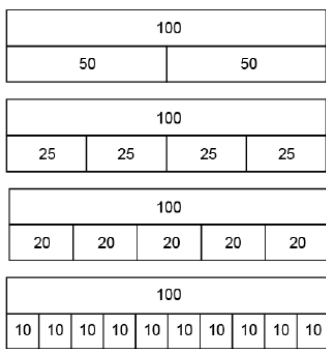
3AS-1 Calculate complements to 100,

I recall number bonds to 9 and to 10. I know that 10 ones are equivalent to 1 ten, and 10 tens are equivalent to 1 hundred.

3NF-3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10), for example:
 $80 + 60 = 140$
 $140 - 60 = 80$

I automatically recall addition and subtraction facts within 10, and across 10. I unitse in tens: understand that 10 can be thought of as a single unit of 1 ten.

I can calculate the compliments to 100



3NF-1 Secure fluency in addition and subtraction facts that bridge 10, through continued practice.

I can calculate products within the 2, 5 and 10 multiplication tables.

×	1	2	3	4	5	6	7	8
1	1	2	3	4	5	6	7	8
2	2	4	6	8	10	12	14	16
3	3	6	9	12	15	18	21	24
4	4	8	12	16	20	24	28	32
5	5	10	15	20	25	30	35	40

3NF-2 Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number.

I know all the addition and subtraction facts that bridge 10

I can recall the multiplication facts and division facts in the 10, 5, 2, 4, 8 tables

3NPV-4 Divide 100 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal parts.

3NPV-3 Reason about the location of any three-digit number in the linear number system, including identifying the previous and next multiple of 100 and 10.



3NPV-2 Recognise the place value of each digit in three-digit numbers, and compose and decompose three-digit numbers using standard and non-standard partitioning.

3NPV-1 Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three-digit multiples of 10.

I can divide 100 into 2, 4, 5 and 10 equal parts

I know that 10 tens are equivalent to 1 hundred

I can count in multiples of 2, 5 and 10.

I can add and subtract across 10

I reason about the location of any two-digit number in the linear number system, including identifying the previous and next multiple of 10.

I recognise the place value of each digit in two-digit numbers, and compose and decompose two-digit numbers using standard and non-standard partitioning.

I know that 10 ones are equivalent to 1 ten. I know how many tens there are in multiples of 10 up to 100.

Year 4 Maths Milestones



Number and place value Number facts

I can measure lines in centimetres and metres.

I can add more than 2 addends.

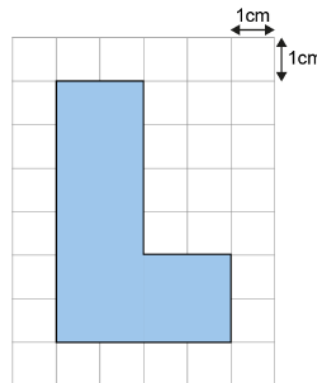
I can recall multiplication table facts.

4G-1 Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant.

Addition/ Subtraction

4G-2 Identify regular polygons, including equilateral triangles and squares, as those in which the side-lengths are equal and the angles are equal. Find the perimeter of regular and irregular polygons.

Shape, space & measure



4G-3 Identify line symmetry in 2D shapes presented in different orientations. Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry.

Identify regular polygons

Find perimeter

I can draw polygons by joining marked points

4F-3 Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers,

I can add and subtract fractions with the same denominator, within 1 whole,

4F-1 Reason about the location of mixed numbers in the linear number system.

4F-2 Convert mixed numbers to improper fractions and vice versa.

I can reason about the location of fractions less than 1 in the linear number system.

Represent composition and decomposition of numbers using equations.

I can identify unit and non-unit fractions

I can multiply two-digit numbers by 10, and divide three-digit multiples of 10 by 10

4MD-1 Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size.

I understand the inverse relationship between multiplication and division. I can write and use multiplication table facts with the factors presented in either order.

4MD-2 Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication.

4MD-3 Understand and apply the distributive property of multiplication.

Memorise multiplication tables.

4NF-3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 100), for example:
 $8 + 6 = 14$ and $14 - 6 = 8$
so
 $800 + 600 = 1,400$
 $1,400 - 600 = 800$

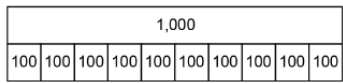
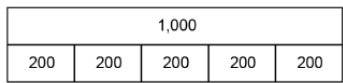
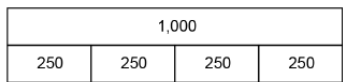
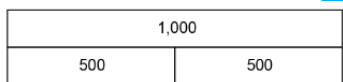
I can apply place-value knowledge to known additive and multiplicative number facts

4NF-2 Solve division problems, with two-digit dividends and one-digit divisors, that involve remainders, for example:
 $74 \div 9 = 8 \text{ r } 2$

I use known division facts to solve division problems.

I can calculate small differences

Solve contextual subtraction problems for all three subtraction structures.



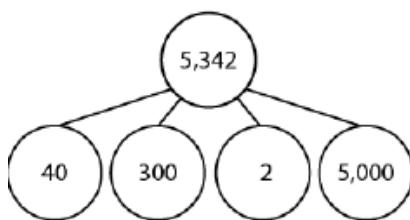
4NPV-4 Divide 1,000 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 1,000 with 2, 4, 5 and 10 equal parts.

I can recall multiplication and division facts in the 5 and 10, and 2, 4 and 8 multiplication tables

4NF-1 Recall multiplication and division facts up to 12×12 , and recognise products in multiplication tables as multiples of the corresponding number.

I can divide 100 into 2, 4, 5 and 10 equal parts

4NPV-3 Reason about the location of any four-digit number in the linear number system, including identifying the previous and next multiple of 1,000 and 100, and rounding to the nearest of each.



4NPV-2 Recognise the place value of each digit in four-digit numbers, and compose and decompose four-digit numbers using standard and non-standard partitioning.

4NPV-1 Know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100; apply this to identify and work out how many 100s there are in other four-digit multiples of 100.

additive calculation

Add and subtract within 100

Add and subtract using mental and formal written methods.

Compare and order numbers

I can reason about the location of any three-digit number in the linear number system

I recognise the place value of each digit in three-digit numbers



I know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10.

Year 5 Maths Milestones



Number and place value Number facts

Addition/ Subtraction

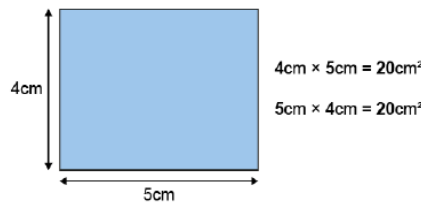
Shape, space & measure

5F-3 Recall decimal fraction equivalents for $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$ and $\frac{1}{10}$, and for multiples of these proper fractions.

I recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations.

I can compose polygons from smaller shapes.

I identify whether the interior angles of a polygon are equal or not.



5G-1 Compare angles, estimate and measure angles in degrees ($^{\circ}$) and draw angles of a given size.

I can divide powers of 10 into 2, 4, 5 and 10 equal parts.

Identify right angles

I can calculate the area of a rectangle

5F-2 Find equivalent fractions and understand that they have the same value and the same position in the linear number system.

I reason about the location of fractions in the linear number system.

5F-1 Find non-unit fractions of quantities.

I can find unit fractions of quantities using known division facts

5G-2 Compare areas and calculate the area of rectangles (including squares) using standard units.

5MD-4 Divide a number with up to 4 digits by a one-digit number using a formal written method, and interpret remainders appropriately for the context.

I can find equivalent fractions

I can divide a number with up to 4 digits by a one-digit number

I recognise multiples of 10, 100 and 1,000. I apply place-value knowledge to known additive and multiplicative number facts. I multiply and divide whole numbers by 10 and 100

5MD-2 Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.

5MD-3 Multiply any whole number with up to 4 digits by any one-digit number using a formal written method.

I can manipulate multiplication and division equations. I solve division problems, with two-digit dividends and one-digit divisors, that involve remainders

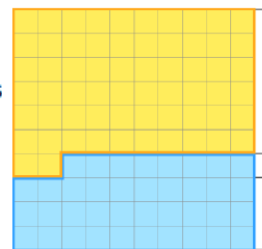
Multiply any 4 digit number by any one digit number

Memorise multiplication tables.

5MD-1 Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size.

I can multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); I understand this as equivalent to scaling a number by 10 or 100.

5NF-2 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth), for example:
 $8 + 6 = 14$
 $0.8 + 0.6 = 1.4$
 $0.08 + 0.06 = 0.14$



I can apply place-value knowledge to known additive and multiplicative number facts

Multiply and Divide numbers by 10 and 100

1			
0.25	0.25	0.25	0.25

5NPV-4 Divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 2, 4, 5 and 10 equal parts.

I can divide 100 and 1,000 into 2, 4, 5 and 10 equal parts. I can find unit fractions of quantities using known division facts

5NPV-5 Convert between units of measure, including using common decimals and fractions.

I can recall multiplication and division facts up to 12 x 12. I solve division problems, with two-digit dividends and one-digit divisors, that involve remainders

5NF-1 Secure fluency in multiplication table facts, and corresponding division facts, through continued practice.

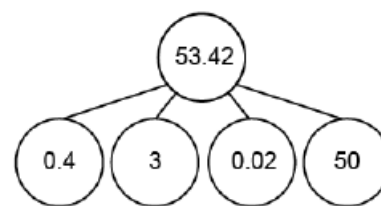
Divide 1 into 2, 4, 5 and 10 equal parts.

Recognise the place value of each digit in numbers with up to 2 decimal places

I can divide 1,000 into 2, 4, 5 and 10 equal parts

5NPV-3 Reason about the location of any number with up to 2 decimal places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each.

5NPV-2 Recognise the place value of each digit in numbers with up to 2 decimal places, and compose and decompose numbers with up to 2 decimal places using standard and non-standard partitioning.



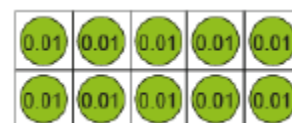
5NPV-1 Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1. Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01. Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01.

Know that 100 hundredths are equivalent to 1 one

Know that 10 tenths are equivalent to 1 one

I can reason about the location of any four-digit number in the linear number system

I recognise the place value of each digit in four-digit numbers, and I can compose and decompose four-digit numbers using standard and non-standard partitioning.



I know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100

Year 6 Maths Milestones



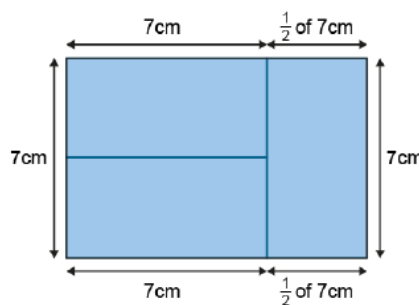
Number and place value Number facts

Addition/ Subtraction

Shape, space & measure

I compare angles, estimate and measure angles in degrees (°) and draw angles of a given size.
I compare areas and calculate the area of rectangles (including squares) using standard units.

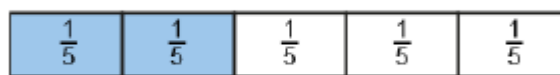
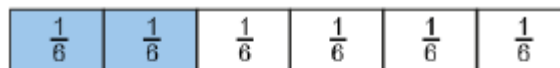
I can find the perimeter of regular and irregular polygons.



6G-1 Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.

Draw, compose and decompose shapes according to given properties

6F-3 Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denominator as a comparison strategy.



$$\frac{2}{5} > \frac{2}{6}$$

6F-2 Express fractions in a common denominator and use this to compare fractions that are similar in value.

Express and compare fractions.

Be fluent in all key stage 2 additive and multiplicative number facts and calculation. I can manipulate additive equations and multiplicative equations. I can find a fraction of a quantity.

6F-1 Recognise when fractions can be simplified, and use common factors to simplify fractions.

Find factors and multiples of positive whole numbers, including common factors and common multiples. I can find equivalent fractions and understand that they have the same value and the same position in the linear number system.

Recognise when fractions can be simplified.

6AS/MD-3 Solve problems involving ratio relationships.

Recall multiplication and division facts up to 12×12 . Apply place-value knowledge to known additive and multiplicative number facts.

6AS/MD-1 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.



Make a given number 10, 100, 1 tenth or 1 hundredth times the size

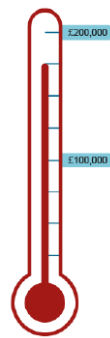
6AS/MD-1 Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).

Solve problems involving ratio.

I reason about the location of numbers between 0.01 and 9,999 in the linear number system.

I can round decimal fractions to the nearest whole number or nearest multiple of 0.01

I can divide 1000, 100 and 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines with 2, 4, 5 and 10 equal parts.



I am fluent in all key stage 2 additive and multiplicative number facts and calculation.

Reason about the location of any number up to 10 million

I can round whole numbers to the nearest multiple of 1,000, 100 or 10, as appropriate.

6NPV-4 Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.

6NPV-3 Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts.

6NPV-2 Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning.

6NPV-1 Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000).

Know, understand and use the power of 10.

Recognise the place value of each digit up to 10 million

I understand the relationship

I recognise the place value of each digit in numbers with units from thousands to hundredths and compose and decompose these numbers using standard and non-standard partitioning.



between powers of 10 from 1 hundredth to 1,000 in terms of grouping and exchange

Millions			Thousands			Ones		
100s	10s	1s	100s	10s	1s	100s	10s	1s
		●	●	●				