Mathematics

Intent

Maths at Hyde Park Schools is designed to be an inclusive subject where all children feel safe, empowered to learn, and suitably challenged. Our intention is to build upon the children's learning from EYFS through to Key Stage Two and prepare all our children for the next phase of their mathematical journey in secondary school.

We have designed our Maths curriculum to provide the best learning opportunities for all our children and allow them to expand their curiosity. The curriculum we deliver is aligned to the National Curriculum and incorporates the models and ideas of teaching Maths for mastery, whilst incorporating Programmes of Studies that meet the needs of our children as identified by staff. These include recognising barriers to learning for children who are disadvantaged or face adverse childhood experiences as well as developing skills that enable children to progress their knowledge and use maths to solve problems. Our Maths curriculum is ambitious and designed to give all learners the knowledge and cultural capital they need to succeed in life.

The Maths curriculum is coherently planned and sequenced to provide our learners with a steady progression of the knowledge and skills needed for future learning and the next phase in their education. We understand that a child's ability to learn is based on gaining knowledge and building on prior knowledge, as well as the ability to use and apply any embedded skills adeptly and competently.

Our Maths curriculum is designed to marry key components such as number facts and mathematical thinking to ensure progress and a greater depth of understanding that leads to mastery and fluency. We ensure that children receive a broad and balanced curriculum, and that learning is relevant, exciting, aspirational, and challenging. We know that numerical competency is vital in all learning and increases children's life chances. Which enables them to have more control over their future lives and use Maths in a real-life context.

The children are encouraged to believe in themselves as mathematicians. We have the same ambitions for all learners and believe that they can all attain a good level of mathematical fluency. The curriculum is designed to be inspiring across the school and this allows children to take control of their own learning journey. This is achieved through careful consideration of individual needs, and, in some cases, individual programmes of study based around the needs of the children.

All learners study the full Maths curriculum, which is broad and balanced, and which aims to provide our children with a wide range of experiences. We have further enhanced our programme using the school's core values which are 'lived' daily through our relationships and school ethos.

Implementation

High quality CPD based on research and learning from best practise gives all teachers and teaching assistants the ability to implement the curriculum fully. The Maths co-ordinators from both schools regularly run staff training and monitoring to ensure that the curriculum is skilfully delivered with the greatest impact. The Maths co-ordinator receives training from the NCETM CODE Maths Hub through regular work groups as well as engaging in additional NCETM training and research projects.

Vocabulary is taught explicitly and effectively in Maths and displayed in the classroom. Learning is made accessible to all, by clear coverage of prior knowledge and learning and, within each lesson, consistent scaffolding, clear presentation of new learning, opportunities to share ideas and strategies and timely feedback. Manipulatives and visual representations are used to expose the structure of the Mathematics being taught and identify patterns and links within different areas of Maths. Opportunities for depth are provided through questioning and reasoning when teaching. This can be during whole class teaching or as an additional task in a Maths lesson.

Formative assessment is used routinely within lessons, to address children's misconceptions. Summative assessments are used at the end of a block of work and termly to track how pupils are progressing against the curriculum. Lessons allow pupils to practise our core values within their learning being brave, curious, optimistic, kind, inclusive, enterprising, and confident learners.

The curriculum provides children with deep learning experiences that are successively built on across the years, providing children with a sequential understanding of how maths ideas develop with understanding. Repetition also plays an important role in securing knowledge and fluency. Therefore, knowledge is often revisited in successive years to allow knowledge to become sticky. There is also repetition within in year for the number facts and previously taught strategies. The curriculum provides diverse and rich opportunities from which children can learn and develop a range of transferable skills, such as in data handling and science. Opportunities are given to show Maths in a real-life context which enables the children to Maths as a skill for life.

Impact

Pupils leave Hyde Park Schools with a secure mastery of mathematical concepts and a fluency of number facts. Through the skills that they have learnt they can apply this knowledge to real life situations. Additionally, they can use Maths to aid their learning and make links in other curriculum subjects They enjoy Maths and are able to use it to improve their adult lives.

We aim for all our children to leave Hyde Park Schools; brave, curious, optimistic, kind, enterprising, inclusive and confident Mathematicians, with the motivation and passion to continue to learn and empowered and enabled to make the most of their lives.

EYFS Progression

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Key facts	**Recognise make and find all numbers up to 5 including written as numbers**		**Recognise and find all numbers up to 10 written as numbers Know number bonds to 5**		**Recognise make and find all numbers up to 10 written as numbers Recall doubles up to 5+5**	
Strand	**Number (Getting to know you, baseline assessments & Just like me)**	**Number Measure, shape, and spatial thinking. (It's me 123 & Light and dark & Alive in 5)**	**Number Measure, shape, and spatial thinking. Time (Growing 6,7,8)**	**Number Measure, shape, and spatial thinking. pattern (Building 9 and 10 & To 20 and beyond)**	**Number Measure, shape, and spatial thinking. (To 20 and beyond & First then now)**	**Number Measure, shape, and spatial thinking. (Find my pattern & On the move)**
Vocabulary	**Number** Count, order, many, Amount, quantity, most, more, few, fewer, equal, repeat, first, second, third, fourth, fifth, add, take away, altogether, more than, fewer than, whole, part **Measure** heavy, light, heavier, lighter, full, empty, half full, nearly full, nearly empty, capacity. mass, holds, **Shape** pattern, sort, copy, continue, repeated pattern, mistake. position, under, over,	**Number** Represent, show, record, compare, more, most, few, fewer, part, whole, first, one less, one more, **Shape** circle, triangle, curved, straight, side, corner 2D **Measure** Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday, day, night, sort, group. sequence, day, night.	**Number** Zero, quantity, addition, subtraction, add, adding, subtracting, take away, compose, part, whole, altogether, **Measure** time, week, month January, February, March, April, May, June, July, August, September, October, November, December, height, tall, short, tallest, shortest, length, long, short, longest, shortest	**Number** Number bond, number pair, teens, Tens, 10s, ones, 1s, representation, predict, tens frame, match. **Shape** 2D, circle, square, rectangle, hexagon, 3D, sphere, pyramid, cylinder, cube, cuboid.	**Number** Add, adding, subtract, subtracting, take away, altogether, first, then, now, missing number, unknown, double, even, odd, group, share, equal, fair.	Review/consolidate understanding of and use of previously taught vocabulary.

	on top, above, next to, besides, in front of, behind, circle, triangle, curved, straight, side, corner 2D					
Skills and knowledge	**<u>Number</u>** • To know the stable order of counting (numbers always said in the same order). • To count one to one (one to one correspondence). • To know the ordinal principle (the last number said will be the total amount). • To know the abstraction principle (anything can be counted even things that you cannot touch). • To know that that counting order is irrelevant (the order you count objects in is irrelevant the amount will stay the same. • To represent numbers up to 3 • To compare numbers up to 3 • To subitise numbers up to 3. • To know different ways of composing numbers up to 3 • To begin to understand the concept of zero. • To compare numbers to 5. • To know different way to compose 4 and 5. • To match and sort amounts within 5. • To compare amounts within 5. • To count objects up to 5. • To recognise numbers up to 5. • To know one more and one less for numbers up to 5		**<u>Number</u>** • To count objects to 10. • To recognise numbers up to 10 • To subitise numbers up to 5 • To know one more and one less for numbers up to 10. • To begin to know bonds to 10. • To combine two groups and find out how many altogether. • To know different ways of composing 6, 7 and 8. • To find pairs within a number • To combine two groups and find out how many altogether. • To know that some numbers are odd, and some are even. • Count to and back from 20. • Start counting forwards and backwards from different points within 20. • Recognise different representations of numbers. • Build numbers up to 20 using manipulatives. **<u>Measure</u>** • To compare length. • To compare height. • To order the months of the year • To understand weeks are in a month • To understand months are in a year		**<u>Number</u>** • To add two groups together using First, then now structure. • To subtract one group from another using First then now structure. • How many did I subtract (this is the precursor to missing numbers) • To solve problems using addition and subtraction (based on first then now) • To find patterns and relationships between numbers • To use counting to solve problems. • To add two groups of objects together. • To subtract a number from a group of objects. • To double a number up to 5+5. • To work out how many have been added to a given number (the precursor to missing number sentences) • To quickly subitise numbers up to 5 • To independently count to 20 and back from 20. • To count to 20 and back from 20 starting in a different place. • To quickly recall number bonds up to 5. • To begin to recall number bonds to 10 **<u>Measure</u>** • To make maps of familiar places.	

	Measure • To compare mass. • To compare capacity. • To sequence events into day and night. • To know the days of the week. **Shape** • To recognise shapes with 4 sides and name some (square and rectangle) • To know and recognise circles and triangles • To explore simple patterns (sequence of 2) • To use simple positional language.	**Shape** • To name simple 3D shapes (cube, cuboid, sphere, cylinder, pyramid) • To describe simple 3D shapes. • To sort simple 3D shapes • To recognise and make simple repeating patterns. (a sequence of 3) • Match and make different shapes using manipulatives (geoboards, numicon, 2D shapes, 3D shapes unifix cubes)	• To use words like longer, shorter, taller when describing measurement. **Shape** • To name and sort 2D shapes independently. • To name and sort 3D shapes independently. • To combine two shapes to make a new shape. • To predict what shapes can be made from a given shape. • To reason about making new shapes from existing shapes (how many different shapes can you make using two rectangles or two right angle triangles) • To find patterns and relationships between shapes.

Year 1 Progression

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Key facts	To rapidly recall number bonds for each number to 10. To know the number bonds to 20 (13+7=20). To read numbers to 20 in numbers and words.		To read and write numbers to 20 in numbers and words. To count on and back to 50. To read numbers to 50 in numerals and words.		To read and write numbers to 50 in numbers and words. To count on and back to 100. To read numbers to 100 in numerals and words. To rapidly recall the number bonds to 20.	
Strand	**Place Value**	**Subtraction within 10**	**Addition and subtraction within 20**	**Place Value to 50**	**Multiplication and Division**	**Time**

Vocabulary	Count, sort, group, number sentences, expression, fewer, greater, equal, less than, more than, equal, <, =, >, fewest, smallest, greatest, representation, prove, check.	subtract, take away equals, number sentence, expression, part-whole, less, difference.	Add, subtract, equals, number sentence, expression, part-whole, more, difference, commutative, tens frame, tens ones.	Count, sort, group, number sentences, expression, fewer, greater, equal, less than, more than, equal, <, =, >, fewest, smallest, greatest, representation, prove, check.	Multiply, pair, twice, equal, unequal, repeated addition, array, row, column.	Day, week, month, January, February, March, April, May, June, July, August, September, October, November, December, first, then, next, morning, evening.
Skills and knowledge	• To count, read and write, forwards and backwards numbers to 10 independently with the correct spelling and formation. • To know One more one less and write as a mathematical expression. • To compare numbers using < = > in an expression. • To know how to put numbers on a number line and use it to order numbers. • To compare and order number independently.	• To use a part whole model to explain mathematical expressions (number sentences). • To write and solve mathematical expressions using - and =. • To rapidly recall number bonds to 10 and begin to use this knowledge to solve calculations. • To using drawings to calculate subtraction problems (crossing out) • To use counting back to solve subtraction calculations (number line). • To know and use the subtraction fact	• To understand the commutative nature of addition (including greatest number first). • To solve worded problems using First then now structure for numbers to 20. • To add numbers together using drawings, tens frames, counting on and number line. • To find and make number bonds (number splits) to support addition. • To add by making ten. • To know that subtraction is not commutative. • To solve worded problems using First then now structure for numbers to 20.	• To count, read and write, forwards and backwards numbers to 50 independently with the correct spelling and formation. • To count in 2s to 30. • To count in tens to 50. • To understand and use tens and ones to explain the structure of 2-digit numbers for numbers to 50. • To place numbers up to 50 on a number line. • To know and use one more and one less than	• To count fluently in 2s, 5s, and tens. • To make and add equal groups. • To use repeated addition to solve problems. • To understand and use array to solve problems. • To use grouping and sharing to solve problems. • To know doubles up to 10+10.	• To sequence events across a day. • To know and order the days of the week. • To solve problems using their knowledge of the days of the week. • To know and sequence the months of the year. • To tell the time to the hour and half hour. • To understand hours minutes and seconds, including how these relate to each other.

		families for numbers up to 10. • To be able to write the addition and subtraction fact families for numbers up to 10. • To be able to work out how many more.	• To subtract numbers using drawings, tens frames, counting on and number line. • To find and make number bonds to help subtraction (number splits). • To know when to use addition or subtraction to solve a worded problem.	numbers up to 50. • To compare numbers using < = > in an expression. • To order numbers to 50 independently.	• To use knowledge of doubles to solve problems. • To use a number line to solve problems.	
Strand	**Addition within 10.**	**Place Value to 20**	**Place Value to 50**	**Measurement (Length and height)**	**Fractions**	**Place Value to 100**
Vocabulary	Add, equals, number sentence, expression, part-whole, more,	Count, sort, group, number sentences, expression, fewer, greater, equal, less than, more than, equal, <, =, >, fewest, smallest, greatest, representation, prove, check	Count, sort, group, number sentences, expression, fewer, greater, equal, less than, more than, equal, <, =, >, fewest, smallest, greatest, representation, prove, check	Compare, long, length, tall, height, measure, centimetre, cm, accurate	Whole, half, quarter, fraction, equal	Count, sort, group, number sentences, expression, fewer, greater, equal, less than, more than, equal, <, =, >, fewest, smallest, greatest, representation, prove, check
Skills and Knowledge	• To use a part whole model to explain mathematical expressions (number sentences). • To write and solve mathematical expressions using + and =. • To know and use addition fact families for	• To count, read and write, forwards and backwards numbers to 20 independently with the correct spelling and formation. • To count in 2s to 20. • To understand and use tens and ones to explain the structure of 2-digit numbers.	• To count, read and write, forwards and backwards numbers to 50 independently with the correct spelling and formation. • To count in 2s to 30. • To count in tens to 50. • To understand and use tens and ones to explain the structure of 2-digit numbers for numbers to 50.	• To compare heights and lengths of 3 objects. • To measure objects using non-standard measurements. • To measure objects using standard measurements (cm). • To solve simple practical	• To understand that a half is one of two equal parts. • To understand that a quarter is one of four equal parts.	• To count forwards and backwards to 100. • To count forwards and backwards starting at different points within 100. • To know one more and one less for numbers within 100. • To put numbers up to 100 on a blank number

	• numbers up to 10. • To rapidly recall number bonds to 10 and begin to use this knowledge to solve calculations. • To use drawings to support addition calculations. • To add to numbers together. • To be able to work out how many more.	• To place numbers up to 20 on a number line. • To know and use one more and one less than numbers up to 20. • To compare numbers using < = > in an expression. • To order numbers to 20 independently.	• To place numbers up to 50 on a number line. • To know and use one more and one less than numbers up to 50. • To compare numbers using < = > in an expression. • To order numbers to 50 independently.	• problems for measurement (order heights and lengths) • To solve simple worded problems for measurement.	• To find a fraction of a shape. • To find a fraction of an amount. • To find a quarter of a shape. • To find a quarter of an amount. • To solve simple reasoning problems using their knowledge of half and quarter.	• line, relative to each other and 100. • To use tens and ones as well as a place value grid to expose the structure of numbers up to 100. • To partition numbers using a variety of representations. • To compare numbers. • To order 3 numbers.
Strand		**Shape**		**Measurement (mass and volume)**	**Time**	**Money**
Vocabulary		Cube, cuboid, cylinder, pyramid, cone, sphere, triangular prism, rectangle, circle, square, triangle, 2D, 2D, curved, flat, face		Compare, weight, mass, heavy, heavier, light lighter, full, half-full, nearly full, empty, measure, capacity, volume	Day, week, month, January, February, March, April, May, June, July, August, September, October, November, December, first, then, next, morning, evening	Pence, pound, coin, note
Skills and knowledge		• Recognise, name and sort 3D shapes. • Describe the faces 3D shapes using	•	• To compare mass and capacity of 3 objects. • To measure objects using	• To sequence events across a day.	• To recognise and order coins. • To recognise and order notes.

		names of 2D shapes. • Solve simple reasoning problems involving shape.		non-standard measurements. • To solve simple practical problems for measurement (order objects by mass/capacity) • To solve simple reasoning problems for measurement.	• To know and order the days of the week. • To solve problems using their knowledge of the days of the week. • To know and sequence the months of the year. • To tell the time to the hour and half hour. • To understand hours minutes and seconds, including how these relate to each other.	• To make given amounts of money. • To make the same amount of money in different ways.
Strand						**Position and Direction**
Vocabulary						Left, right, forwards, backwards, half turn, quarter turn, full turn, top, in between, bottom,

						above, below, position, direction
Skills and knowledge						• To know and use left and right, up and down. • To describe the position of an object relative to another object. • To understand and use half turn, quarter turn and whole turn to solve problems.

Year 2 Progression

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Key facts	**To independently count in 2s, 5s, and 10s. To rapidly recall and use multiplication and division facts for 2, 5 and 10.**					
Strand	**Place Value**	**Money**	**Statistics**	**Fractions**	**Worded problems (Addition and subtraction)**	**Position and direction**
Vocabulary	Count, sort, group, number sentences, expression, fewer, greater, equal, less than,	Coins, notes, pounds, pence, £, change, total, amount, difference	Tally, pictogram, block diagram, total, altogether, more, less, difference	Fraction, part, whole, whole, half, quarter, three-quarter, equal	Add, addition, more, total, altogether, remaining, difference	Left, right, half turn, quarter turn, full turn, clockwise anti-clockwise, rotate

	more than, equal, <, =, >, fewest, smallest, greatest, representation, prove, check					
Skills and knowledge	• To count, read and write, forwards and backwards numbers to 100 independently with the correct spelling and formation. • To reliable count objects up to 100 by grouping in tens and ones. • To use a variety of representations to illustrate numbers up to 100 (part-whole, base ten tens frames, straws, bead string, bead bar, numicon) • To quickly partition numbers.	• To recognise coins and notes and understand the value relative to each other. • To make amounts in coins, notes and mixed coins and notes. • To compare amounts including mixed coins and notes. • To add amounts including adding mixed amounts. • To find the difference between amounts. • To calculate change.	• To recognise use and interpret a tally chart. • To recognise use and interpret a pictogram. • To use a scale on a pictogram (where one picture represents either, 2, 5 or 10). • To recognise use and interpret a block diagram. • To use a scale on a block diagram (where one block represents either, 2, 5 or 10).	• To identify equal parts of a shape. • To recognise and find half of a shape or number (including 2-digit numbers). • To recognise and find a quarter of a shape or number (including 2-digit numbers). • To recognise and find a third of a shape or number (including 2-digit numbers). • To recognise and find three quarters of a	• To use knowledge of addition to solve worded problems including 2 step worded problems. • To use knowledge of subtraction to solve worded problems including 2 step worded problems.	• To describe the position of an object. • To describe the movement of an object (a route). • To understand and use quarter turn, half turn, whole turn clockwise and anti-clockwise. • To solve problems involving turns.

	• To know One more one less of numbers up to 100. • To compare up to 4 numbers using < = > in an expression. • To know how to put numbers up to 100 on a blank number line and use it to order numbers. • To compare and order number independently. • To count in 2s, 5s and 10s independently. • To begin to count in 3s.	• To calculate change as part of a two-step problem.	• To record data using statistics. •	shape or number (including 2-digit numbers). • To understand and write unit fractions. • To understand and write non-unit fractions (2/3, 3/4). • To count in fractions • To know that 2/4 is equivalent to 1/2.		
Strand	**Addition and subtraction.**	**Multiplication and Division**	**Shape**	**Measurement (Length and height)**	**Worded problems (Multiplication and Division)**	**Fractions**
Vocabulary	Add, equals, number sentence, expression, part-whole, more,	Multiply, multiple, divide, pair, twice, equal, unequal, array, row, column	2D, 3D, circle, square, rectangle, quadrilateral, pentagon, octagon, cone, cylinder, cube,	Compare, long, length, tall, height, measure, centimetre, cm, metre, m, accurate	Multiply, divide, groups of, lots of, altogether, remaining, difference	Whole, half, quarter, three-quarter, third, equal.

			cuboid, sphere, triangular prism, sides, vertices, edges, line of symmetry, faces, curved, flat			
Skills and Knowledge	• To know and use the number bonds to 100 for the multiples of ten. • To rapidly identify and use number splits to support efficient addition and subtraction. • To add a multiple of 10 to a 2-digit number efficiently. • To use a place value grid to add and subtract 2-digit numbers, exchanging where necessary. • To use a number line to efficiently add and subtract 2-digit numbers (jumping to the nearest 10 etc). • To solve reasoning and worded	• To independently count in 2s, 5s, and 10s. • To count in 3s. • To know multiplication facts for 2, 5 and 10. • To understand and use the x and ÷ symbols. • To understand arrays and use them to solve problems. • To know that the 2 times table is equivalent to doubling. • To understand the relationship between the 2 times table and odd and even numbers. • To using sharing and grouping to	• To recognise common 2D and 3D shapes (see vocabulary). • To know the properties of commons 2D and 3D shapes. • To recognise a line of symmetry and be able to draw one. • To sort shapes by their properties. • To make extended repeating patterns including symmetrical ones.	• To compare heights and lengths of 3 objects using metres and centimetres. • To accurately measure objects using standard measurements (m, cm). • To solve problems for measurement (which may use any of the four number operations)	• To use knowledge of multiplication to solve worded problems. • To use knowledge of division to solve worded problems.	• To find a half, quarter, three-quarters or a third of numbers up to 50. • To solve worded problems for fractions.

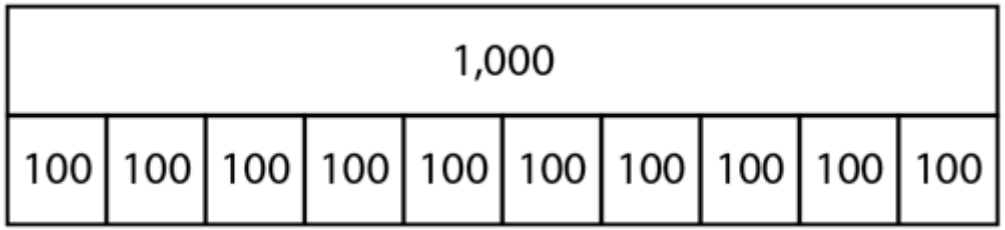
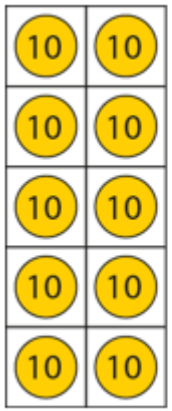
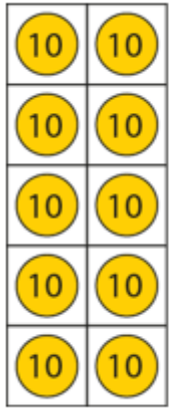
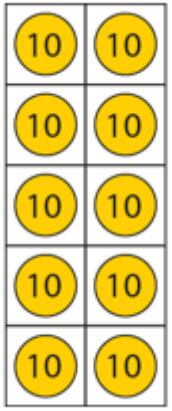
	problems for addition and subtraction.	solve multiplication and division problems.				
Strand				**Measurement (mass, and temperature)**	**Time**	**Place Value to 100 (consolidation)**
Vocabulary				Compare, weight, mass, heavy, heavier, light lighter, temperature, hot cold, Centigrade, ˚C, degree, scale	Second, minute, hour, 24 hours, am, pm, half past, o'clock, quarter past	Count, sort, group, number sentences, expression, fewer, greater, equal, less than, more than, equal, <, =, >, fewest, smallest, greatest, representation, prove, check
Skills and knowledge				• To measure mass in kilograms and grams. • To compare measurements of mass and order them using standard units. • To choose sensible units to measure the mass of an object. • To solve worded problems using mass (which may use any of the four	• To tell the time to the hour, half hour and quarter past. • To solve problems relating to time in minutes or hours. • To know that there are 24 hours in a day and read a 24hour time. • To write time in minutes and ours with an awareness of am and pm.	• To quickly partition numbers up to 100 using different representations. • To use partitioning numbers to support addition and subtraction of 2-digit to 2-digit numbers. • To recall number facts quickly and efficiently. • To add numbers onto a blank number line bridging through 100.

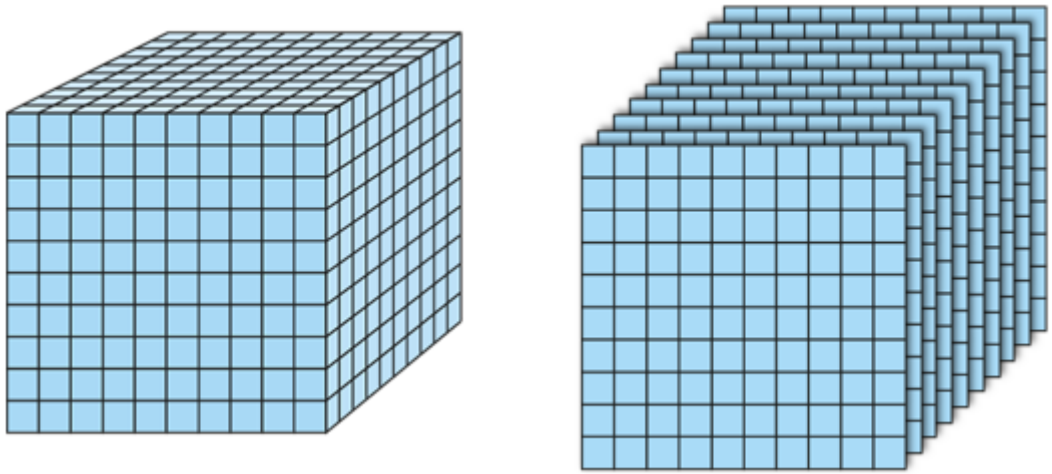
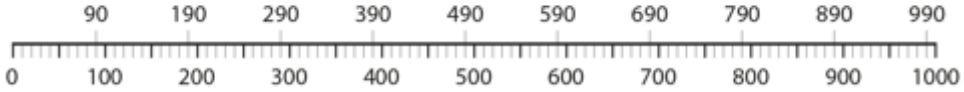
				number operations). • To read a scale which may be calibrated in 1s, 2s, 5s, 10s or 100s.	• To tell time to 5 minutes.	
Strand					**Measurement** **Volume and capacity**	
Vocabulary					Compare, volume, capacity, full, half-full, nearly full, empty, measure, millilitres, ml litres, l, scale	
Skills and knowledge					• To compare the volume of 3 objects using millilitres and litres. • To read a scale which may be calibrated in 1s, 2s, 5s, 10s or 100s. • To choose sensible units to measure the volume of a fluid. • To accurately measure objects using standard measurements (ml, l).	

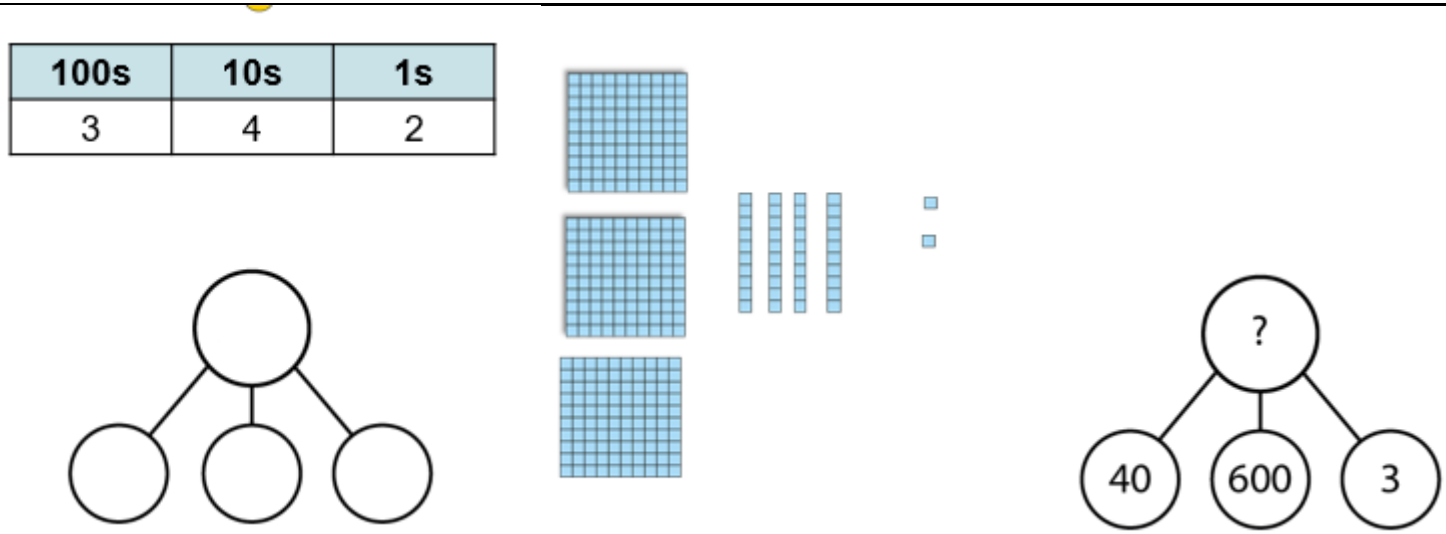
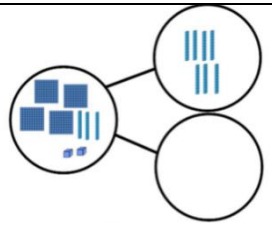
					• To solve problems for measurement (which may use any of the four number operations)	

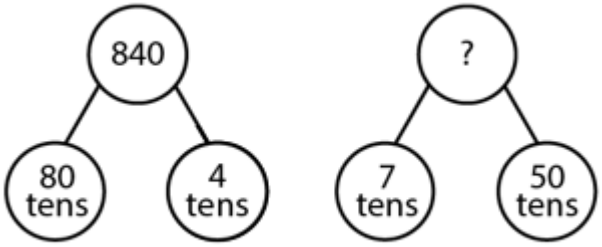
Year 3 Progression

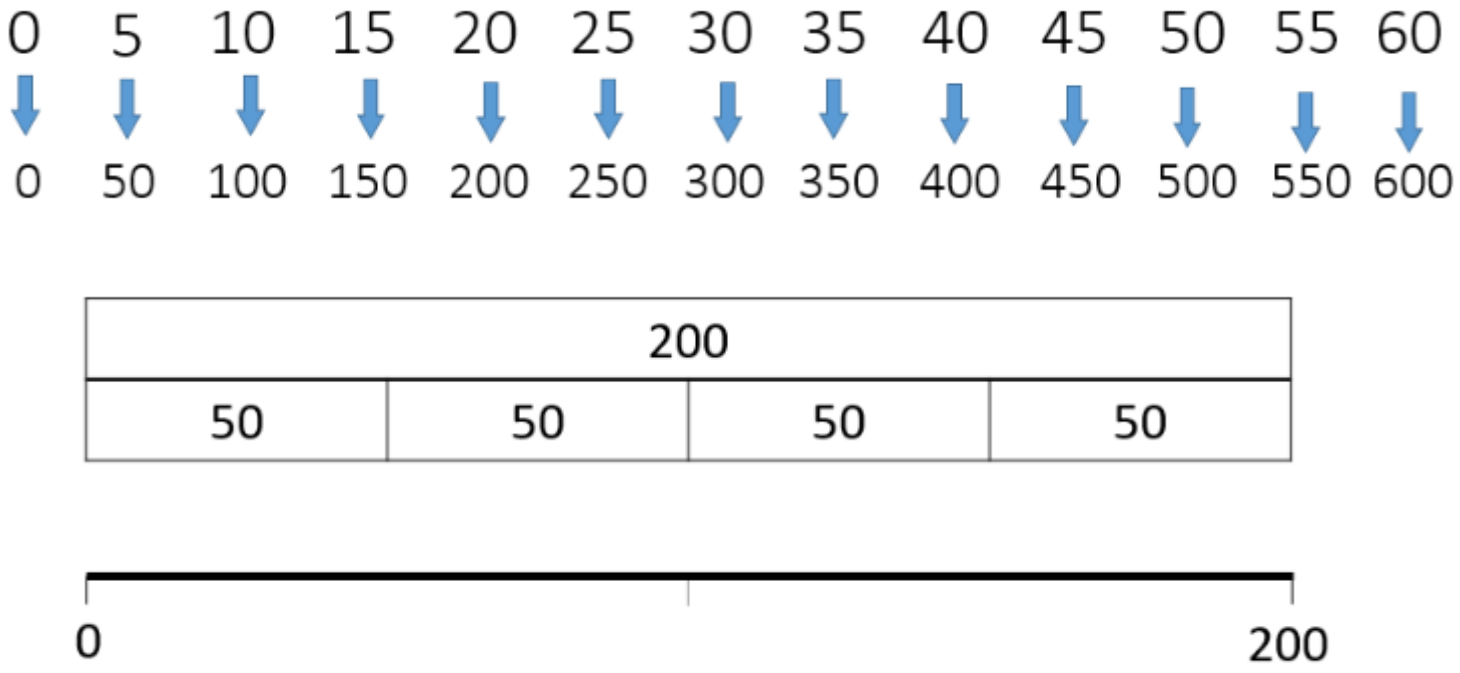
Autumn 1	Y3 Place Value and number knowledge to 1000
Prior Learning	Children must know their place value to 100 so add in as an intervention or a review to fill any gaps. They need to know basic place value e.g., there are ten ones in one ten and ten tens in one hundred. They need to be able to count above 100 and read, write, and recognise numbers to 1000. They need to be able to count in 2s, 5s and 10s They should know half of 100 is 50 They should know their number bonds to 100 (10s)
Continuous Provision	Time measure and money (previous year groups objectives)
Key Vocabulary	Use the language of unitising for example 70 is 7 tens 170 is one hundred and 7 tens and also 17 tens Ones tens hundreds thousands thousands hundreds tens and ones
Key Facts	Number bonds to 100 60 + 40 (tens) 63 + 37
Skills and Knowledge: By the end of the teaching sequence children should…	Examples and models and images to use

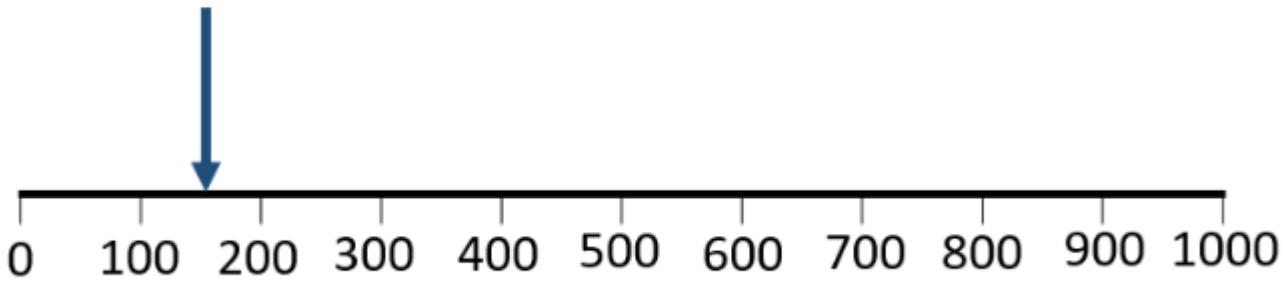
Know there are 10 tens in a 100 and 10 hundreds in 1000	 Draw links with unitising.  100 = 10 tens 100 = 10 × 10   200 = 20 tens 200 = 20 × 10

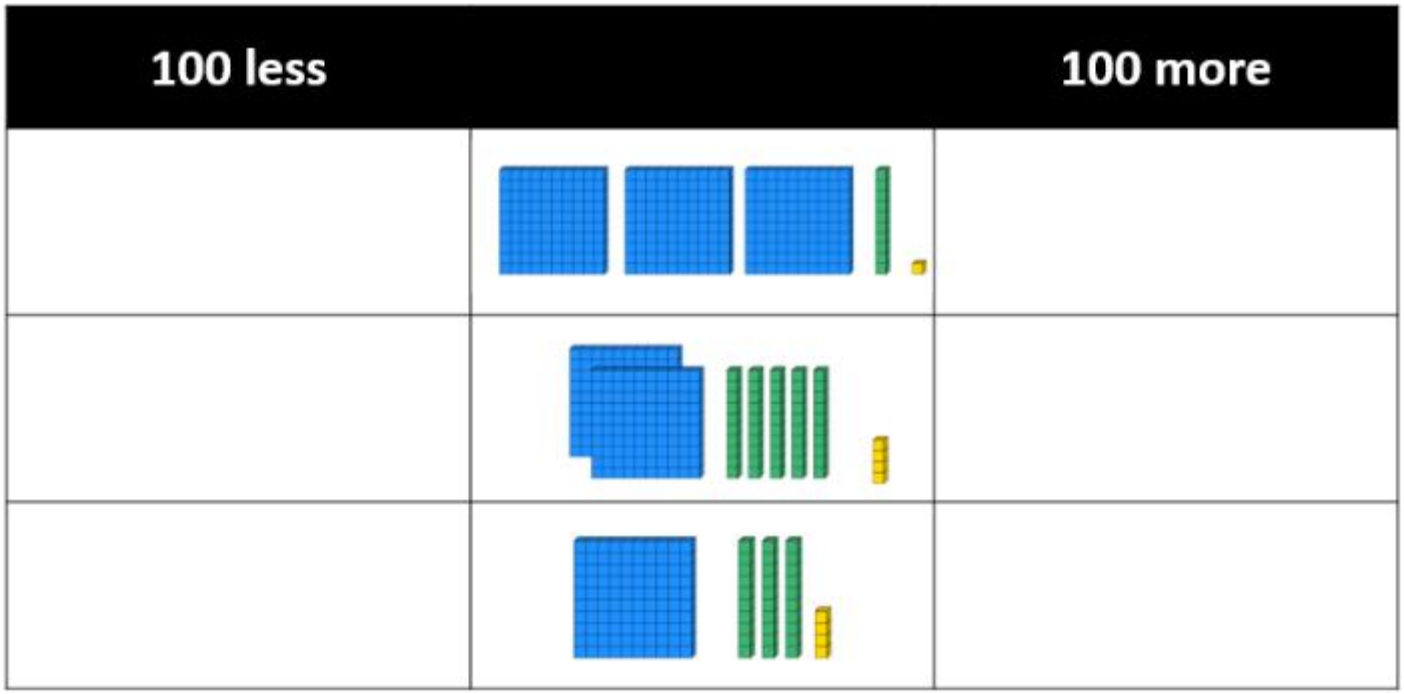
	
Count in 100s to 1000 NCETM 1.18	Also link with familiar counting such as counting in twos and 5s and 10s crossing 100 barrier 

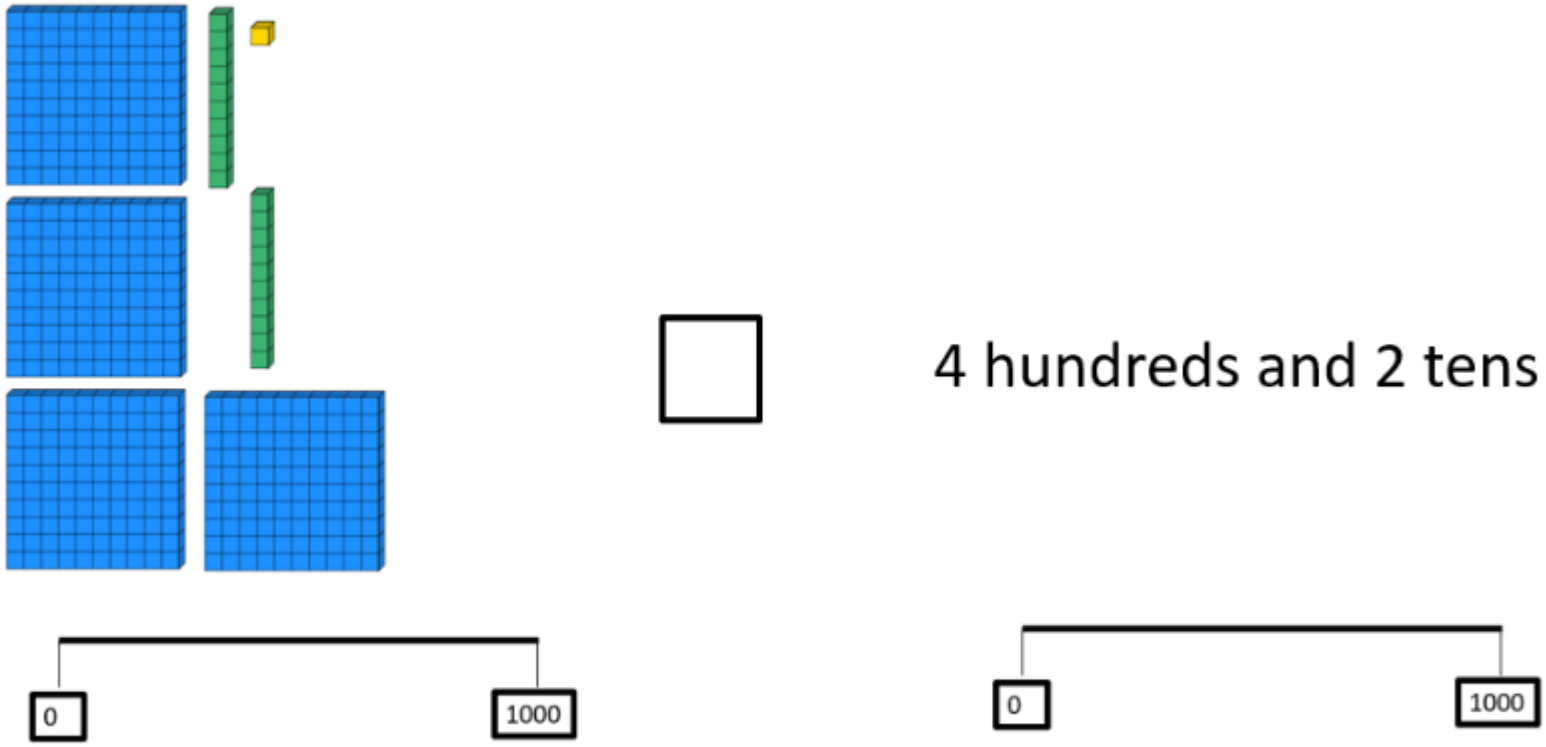
Represent numbers to 1000 and partition numbers to 1000 in a PV chart and part whole model NCETM 1.18	
Partition numbers to 1000 in a variety of ways including unitising NCETM 1.18	 647 = 64 tens and 7 ones 647 = 63 tens and 17 ones

	Give children plenty of opportunity to play with this concept using concrete apparatus 
Order numbers to 1000	
Read and write numbers to 1000	

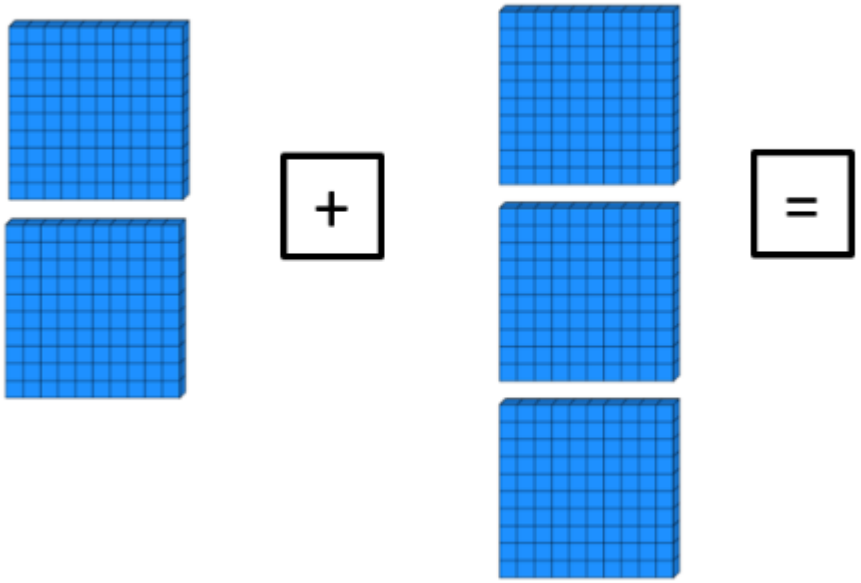
Count in and recognise multiples of 50 NCETM 1.18	

Place any number to 1000 on a number line with 100s NCETM 1.18	
Place any number to 1000 on an ENL NCETM 1.18	

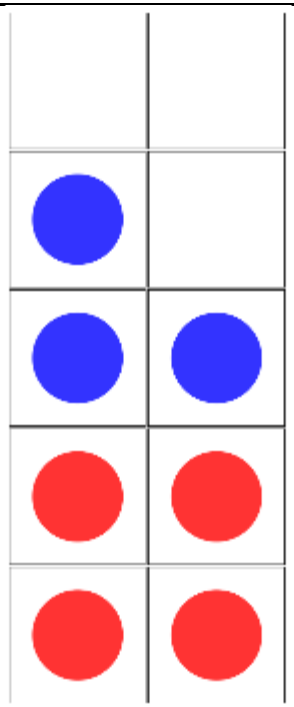
Know 1/ 10/ 100 more/less than any number to 1000	

Compare numbers to 1000 using < > =	
Autumn 1	**Y3 Addition and Subtraction – informal methods**
Prior Learning	**Children should be able to use ENL strategies for 1 and 2 digit numbers where appropriate by making the next multiple of 10 or overjumping or jumping in 10s. They should know that addition is commutative, and subtraction isn't, and they should know how to**

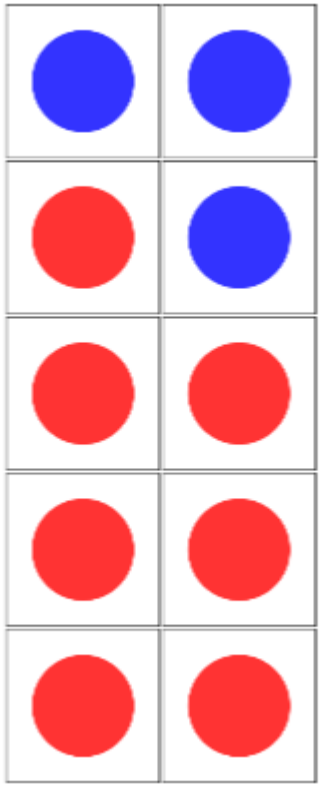
	find the difference by adding on. They should know their number bonds to 20 and number bonds to 100 (tens)They should be able to estimate an answer e.g., 14 +17 is around 30
Continuous Provision	**Number bonds within 20 doubles and halves to 20 and beyond adding 3 numbers estimating using the inverse and solve empty box calculations and balancing equations.**
Key Vocabulary	**sum, difference, total, difference, altogether, how many more, how many less**
Key Facts	**Number bonds to 100 Doubles and halves to 100 and beyond (tens) e.g., 70 +70 = 140**
Skills and Knowledge: **By the end of the teaching sequence children should…**	**Examples and models and images to use**

Add and subtract multiples of 100	

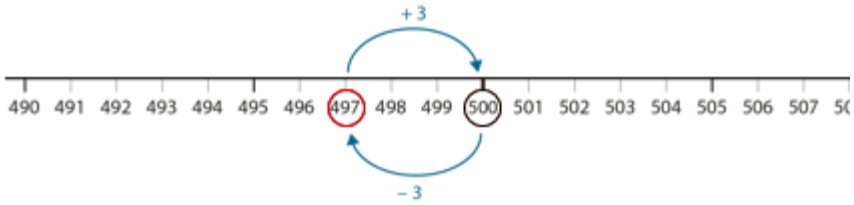
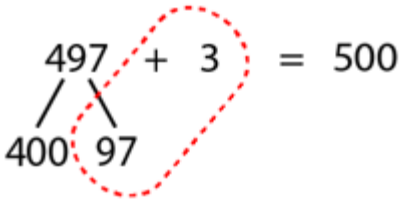
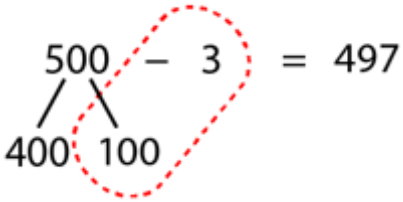
	7	
	4	3
	7 hundreds	
	4 hundreds	3 hundreds
	700	
	400	300

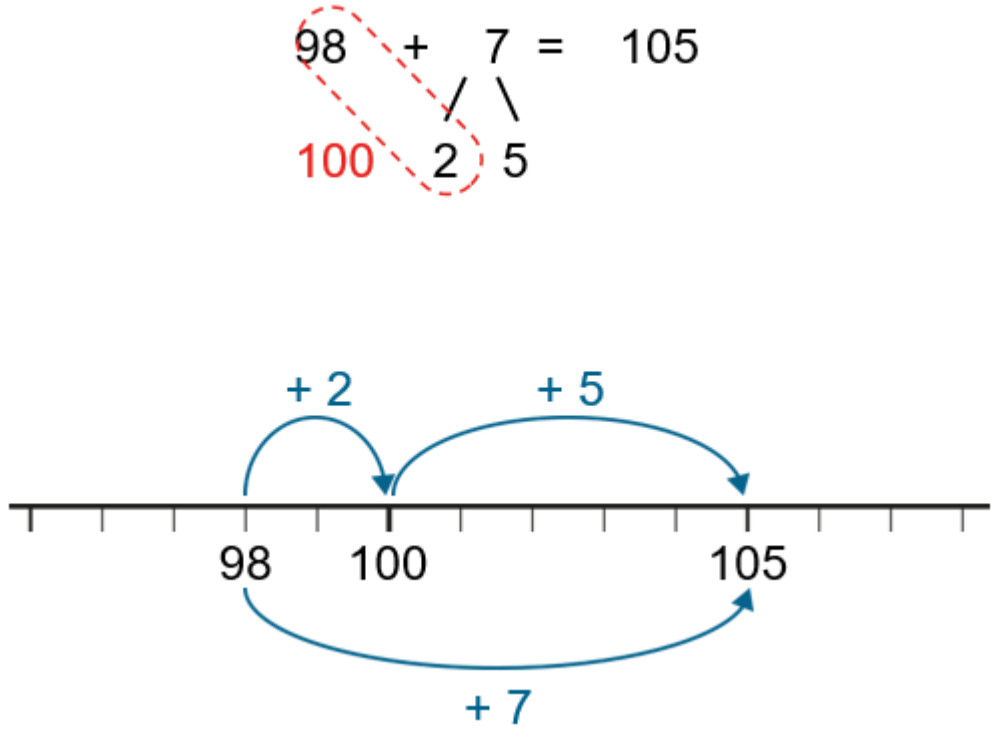


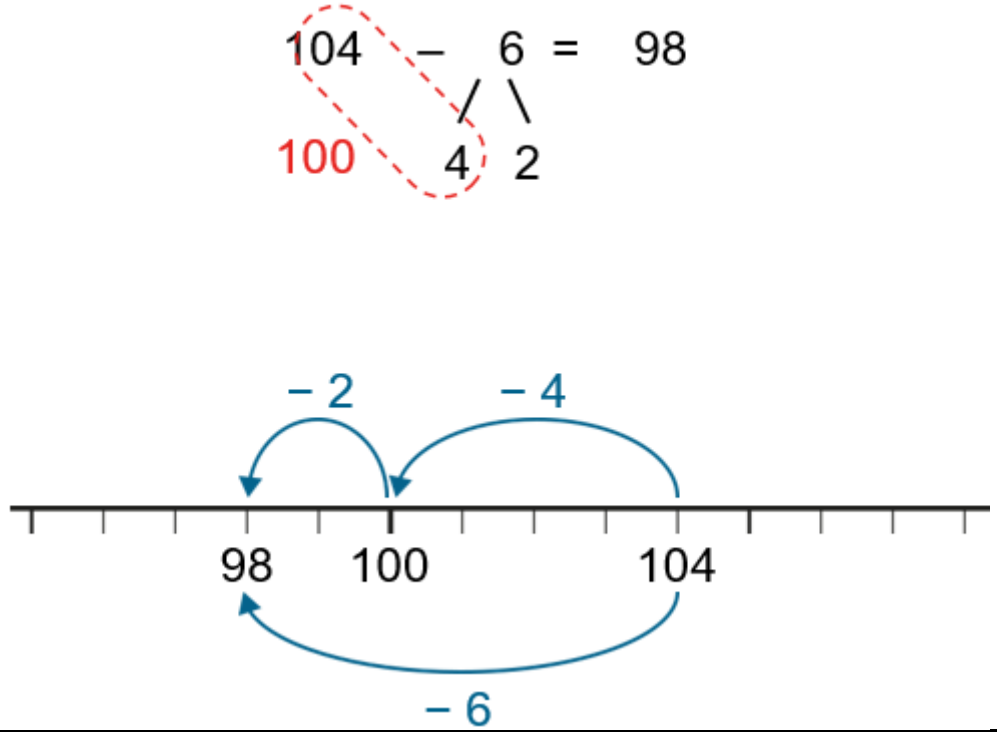
Number bonds to 1000 – 100s	2 + 8 = 10 20 + 80 = 100 200 + ____ = What do you notice?

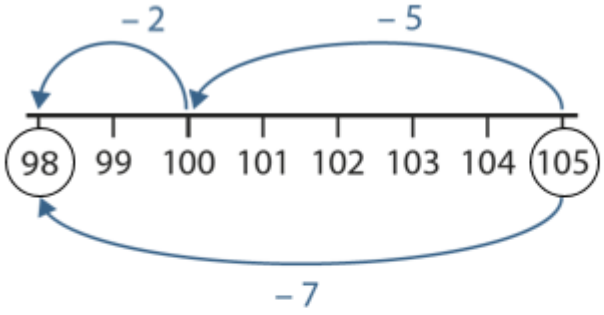


Use the same image as
Number bonds to 10

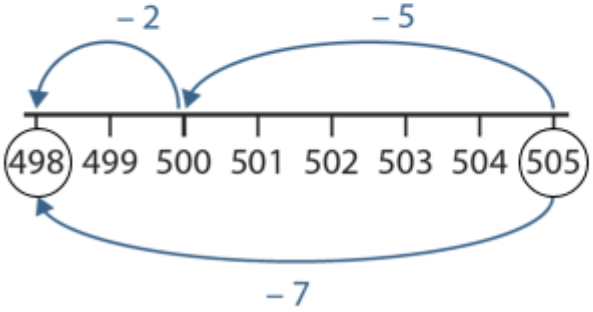
Add/subtract ones to/from 3d numbers to hitting multiples of 100 image NCETM	  
Add/subtract ones to/from 3d numbers crossing 10s and 100s image NCETM	


98 + 7 = 105
100 2 5
+ 2
+ 5
98
100
105
+ 7

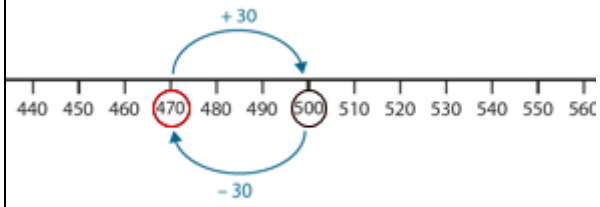
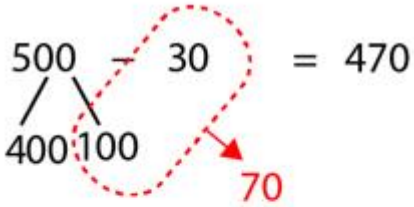
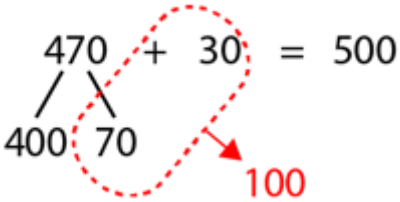
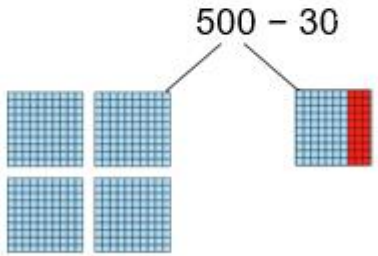

104 – 6 = 98
100
4
2
– 2
– 4
98
100
104
– 6

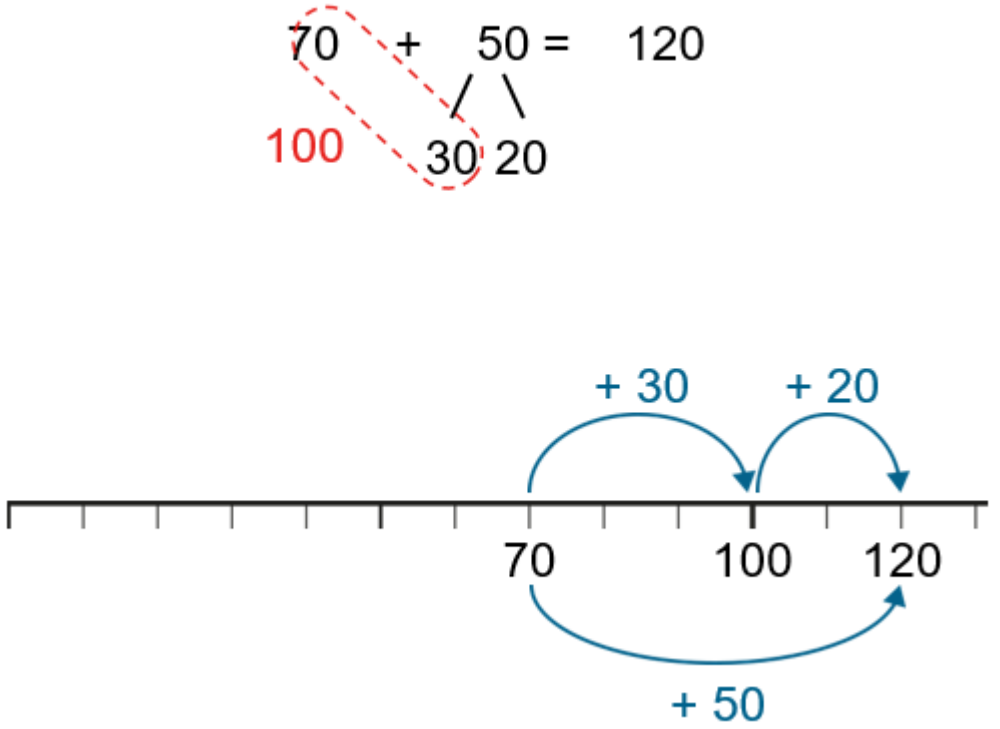


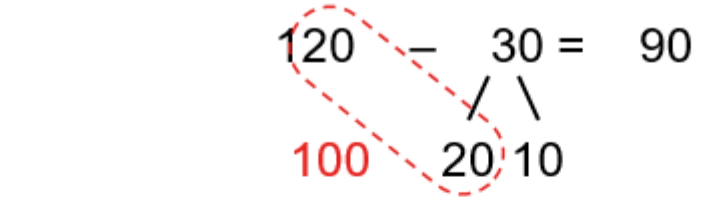
105 – 7 = 98

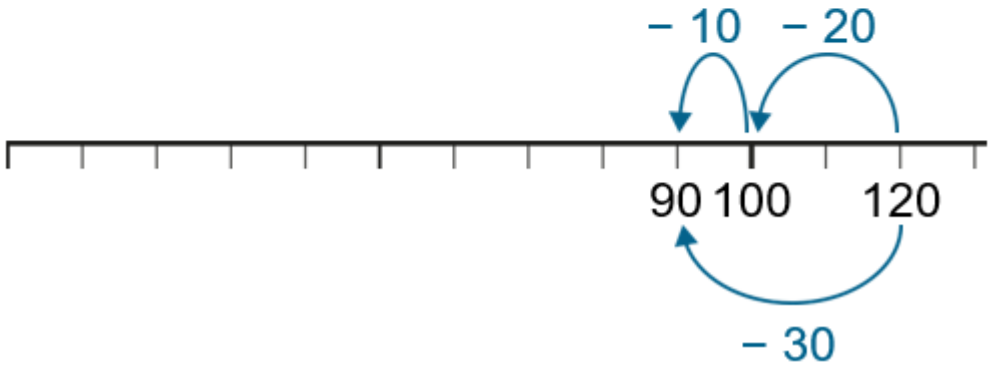


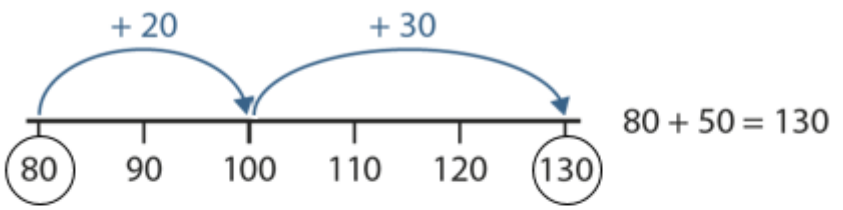
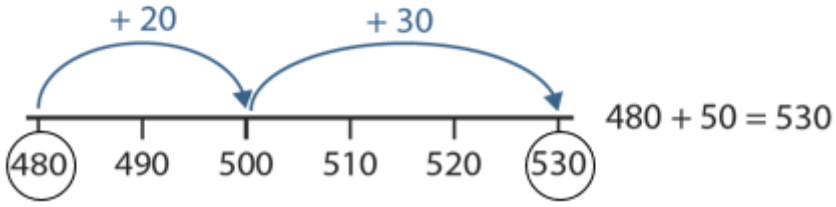
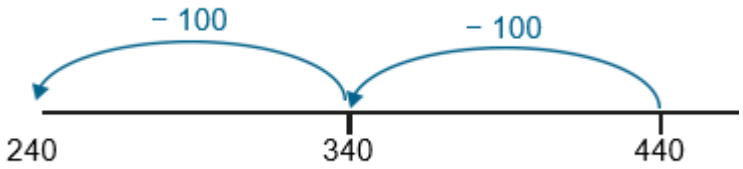
505 – 7 = 498

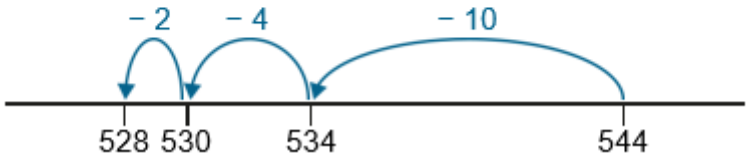
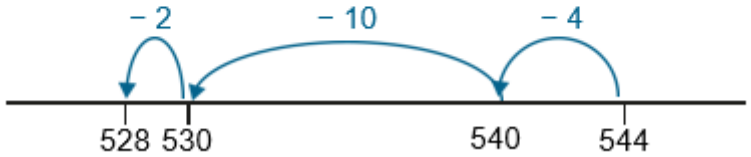
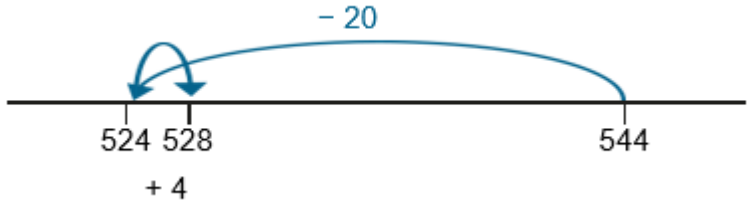
Add/subtract tens to/from 3d numbers to hitting multiples of 100 image NCETM	   

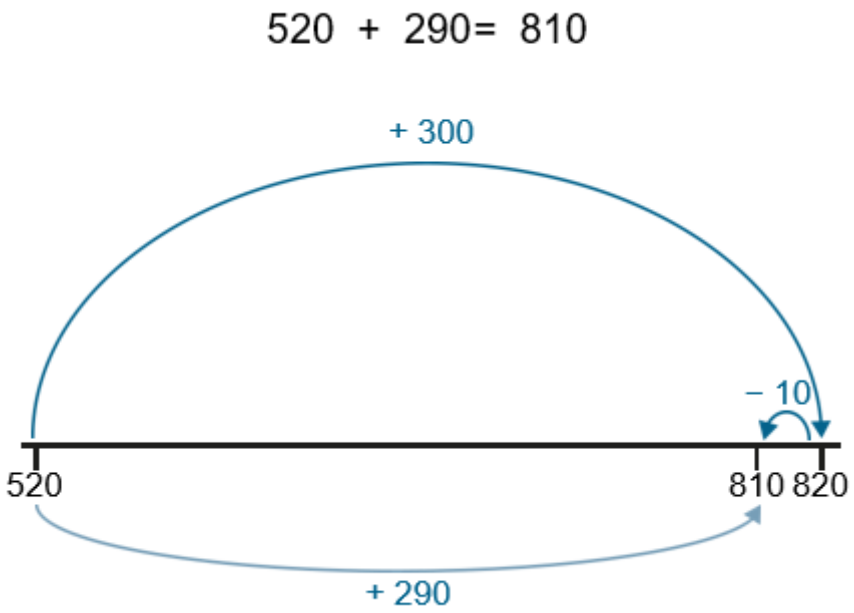
Add/subtract tens to/from 3d numbers crossing 100s NCETM 1.18	


120 – 30 = 90
100
20
10

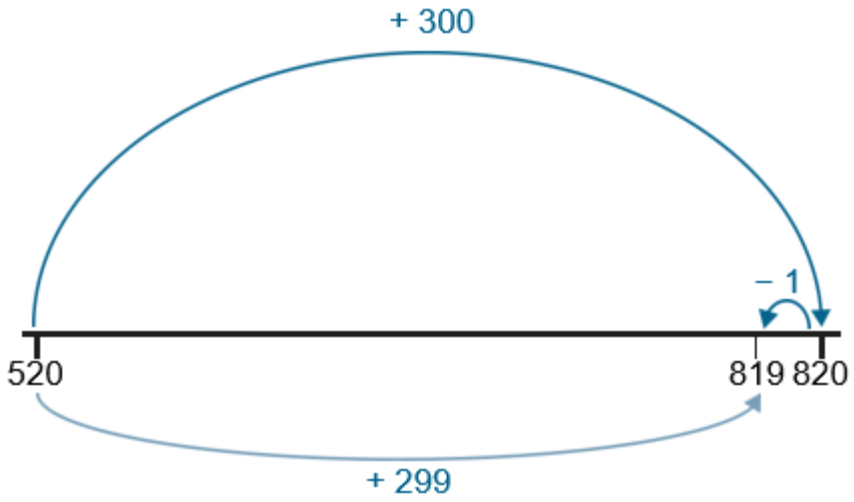

– 10
– 20
90
100
120
– 30

	 80 + 50 = 130  480 + 50 = 530
Add/subtract hundreds to/from 3d numbers image NCETM	

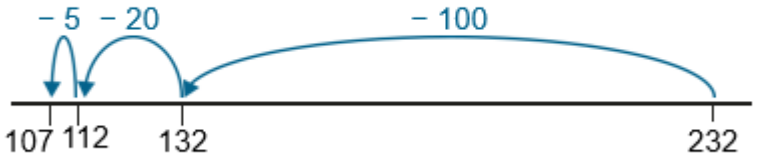
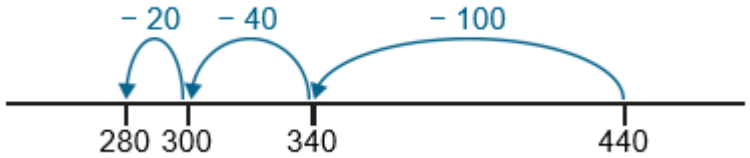
Add/subtract 2d to/from 3d numbers using ENL strategies Counting in 10s, over jumping and hitting 10s. image NCETM	544 − 16= 528  544 − 16= 528  
Add/subtract 3d to/from 3d	Over jumping

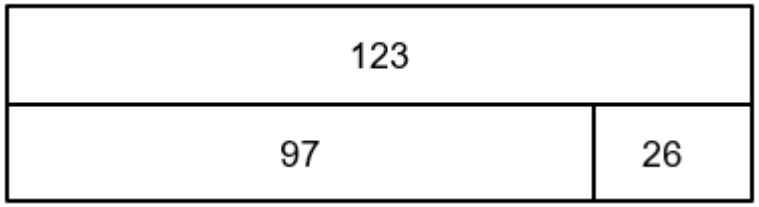
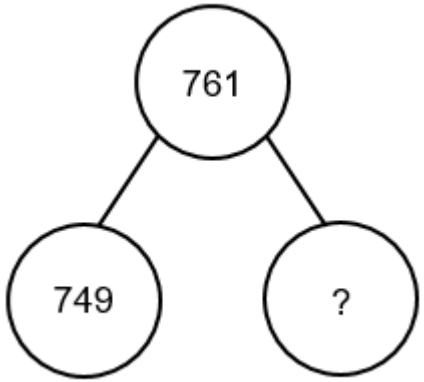
numbers using ENL strategies image NCETM	

520 + 299= 819



Jumping in hundreds, tens and ones

	232 − 125 = 107  440 − 160= 280 
Use finding the difference / adding on for numbers which are close together image NCETM	761 − 749= 12

Use bar model and part whole models to create inverse calculations image NCETM	 
Be exposed to problems with time, money and measure .	
Be exposed to problems with statistics such as reading graphs.	
Autumn 2	**Y3 Addition and Subtraction (Written methods)**
Skills and Knowledge	**Examples and models and images to use**

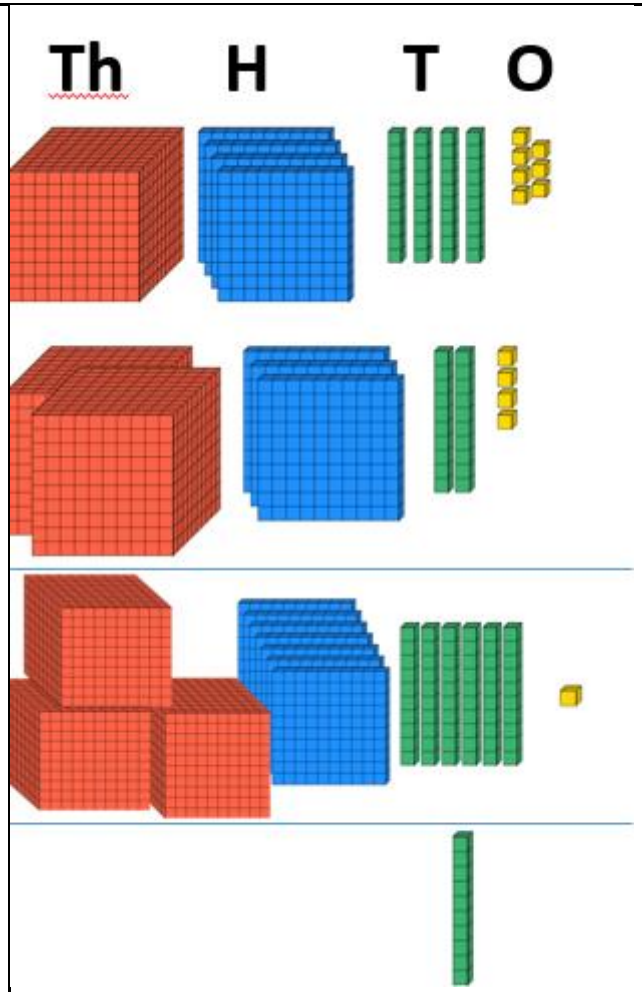
By the end of the teaching sequence children should…	
Add 3d numbers using column addition with no exchange	
Add 3d numbers using column addition with one exchange	

Add 3d numbers using column addition with more than one exchange

Th	H	T	O
1,000	400	40	7
+ 2,000	300	20	4
3,000	700	70	1
		10	

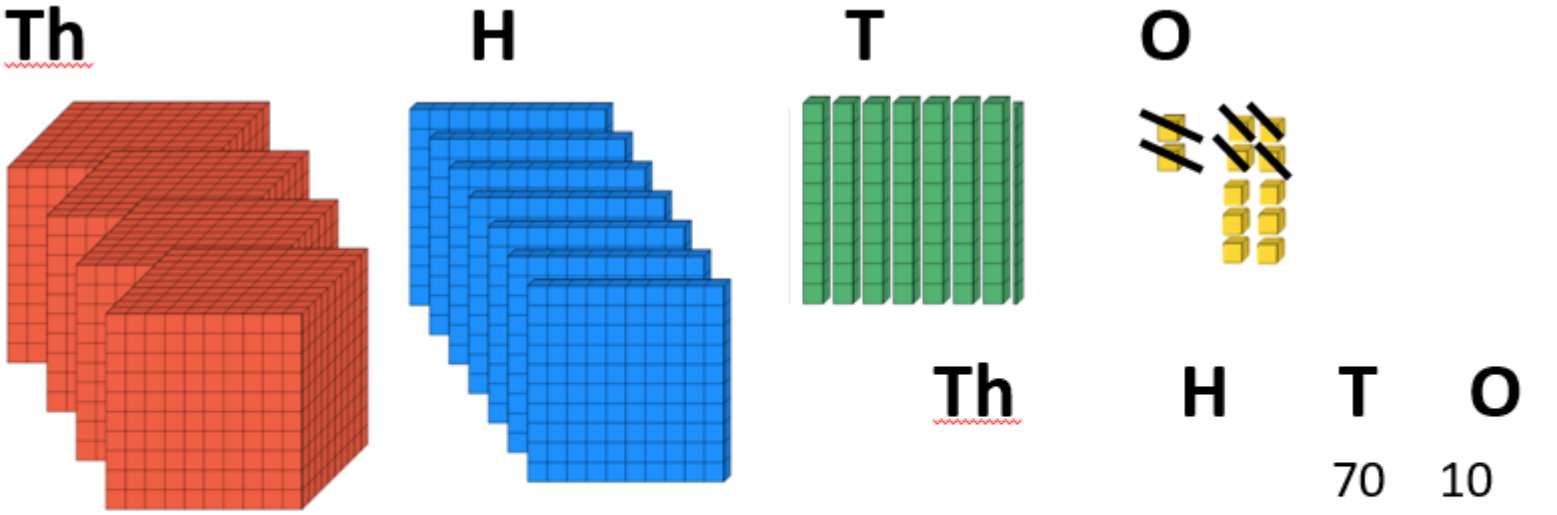
Th	H	T	O
	1	4	4 7
+	1	3	2 4
	3	7	7 1
			1

Note: expanded form is good for exposing the structure but can be confusing if relied upon as a method.


Th
H
T
O

	Eleven ones is exchanged for one ten and one one **Images from Year4 Y3 ones to follow**
Subtract 3d numbers using column addition with no exchange	

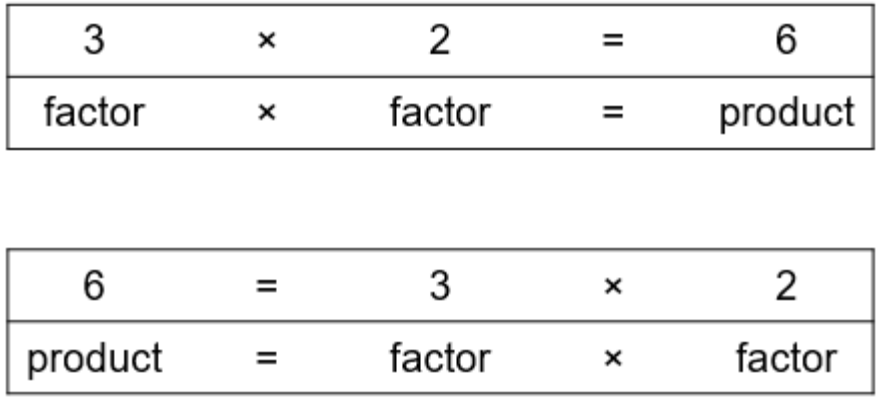
Subtract 3d numbers using column addition with one exchange	There is not enough ones to subtract 6 so exchange one ten for ten ones. Ten ones plus 2 ones is 12 ones. 12 ones subtract 6 ones is 6 ones. Now there is 7 tens not 8 tens. 7 tens subtract 3 tens is 4 tens etc. Use PV counters once secure with the concept. Moving to abstract algorithm	

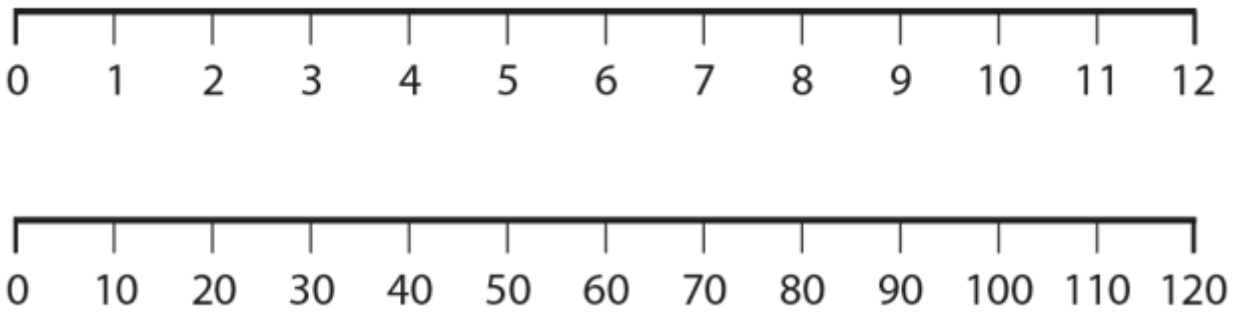
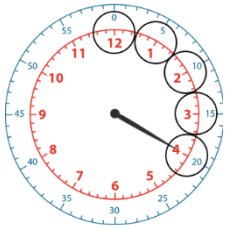


Th	H	T	O
		70	10
4,000	700	~~80~~	2
- 2,000	500	30	6
2,000	200	40	6

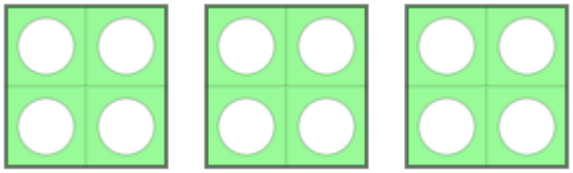
Subtract 3d numbers using column addition with more than one exchange	

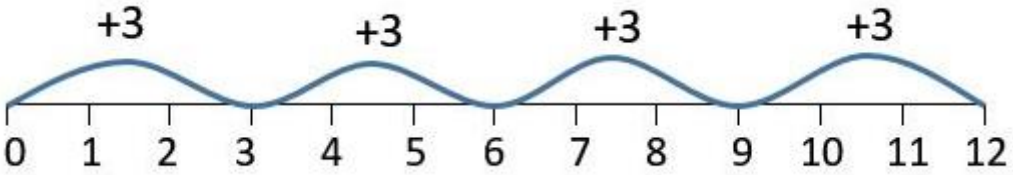
Use the inverse to check answers and show calculations as part – whole models	
Be able to solve one step and two step problems in different contexts using addition and subtraction and apply the correct calculation method e.g measure and time reviewed from Y2	Also write 4 calculations that go with the part whole model **Images to follow**
Autumn 2	**Multiplication and Division**
Prior Learning	**Children should be fluent in their 2s, 5s and 10s multiplication and division facts** **They should know that multiplication is commutative, and that division isn't** **They should understand multiplication as repeated addition** **Understand multiplication and division as an array** **Refer to NCETM Y2 PD materials and Dfe Ready to Progress Y1 and Y2 Multiplication and Division**
Continuous Provision	**All the times tables and using tables (2s, 5s and 10s) in context of money and time (Y2)**
Key Vocabulary	**Use group size and number of groups 3 , 4 times** **Use the language of dividend ÷ divisor = quotient factor x factor = product** **Understand and use the word multiple** **Understand and use multiply, divide, groups of, lots of, grouping and sharing (quotitive and partitive division)** **Use unitising language 30 x 4 3 tens, 4 times**

Key Facts	**2s 5s and 10s times tables 3s 4s and 8s times tables** **Understand the concept of multiplying by 1 and by 0** **Understand the concept of dividing by 1 and itself** **Use fact triangles to make multiplication and division fact families and extended fact families** **Make links with doubling and halving**
Skills and Knowledge: **By the end of the teaching sequence children should…**	**Examples and models and images to use**
Understand the symbols x ÷ and = and the language of factor and product NCETM 2.3 **REVIEW**	

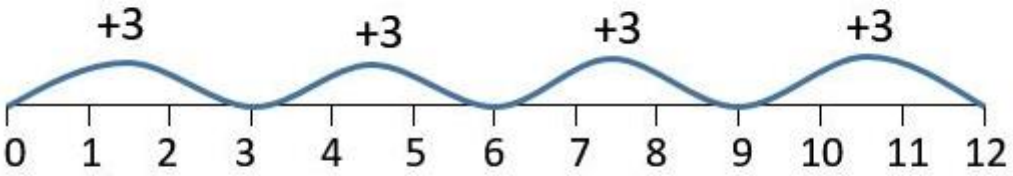
Can link the 10 x table with place value NCETM 2.4 **REVIEW**	
5 x table with markings on a clock face NCETM 2.4 **REVIEW**	5 x 4 = 20 20 past Use as an opportunity to review time from Y2 

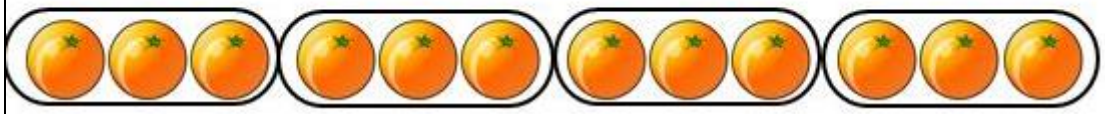
Link 2s, 5s , 10s times tables to money NCETM 2.4 **REVIEW**	5p x 4 = 10p x 2
Know the multiplication and division facts for the 3, 4 and 8 times tables – teach the following through the 3s, 4s and 8s See NCETM and White Rose for activities to reinforce facts and teach the key concepts	

Know that multiplication can be expressed as repeated addition NCETM 2 .2	4 + 4 + 4 = 4 x 3 = 12 5 + 5 + 5 



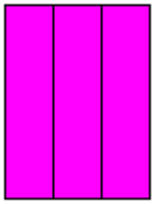
3 x 4 is the same as 3 + 3 + 3 + 3





Use counters and Cuisenaire rods alongside the number line and/or bar model which can then be turned into an array.

Can express multiplication and division as an array and recognise that they can be read both ways. Remember group size and number of groups.

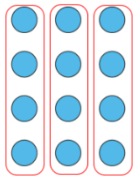


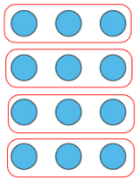
3 x 4 = 12

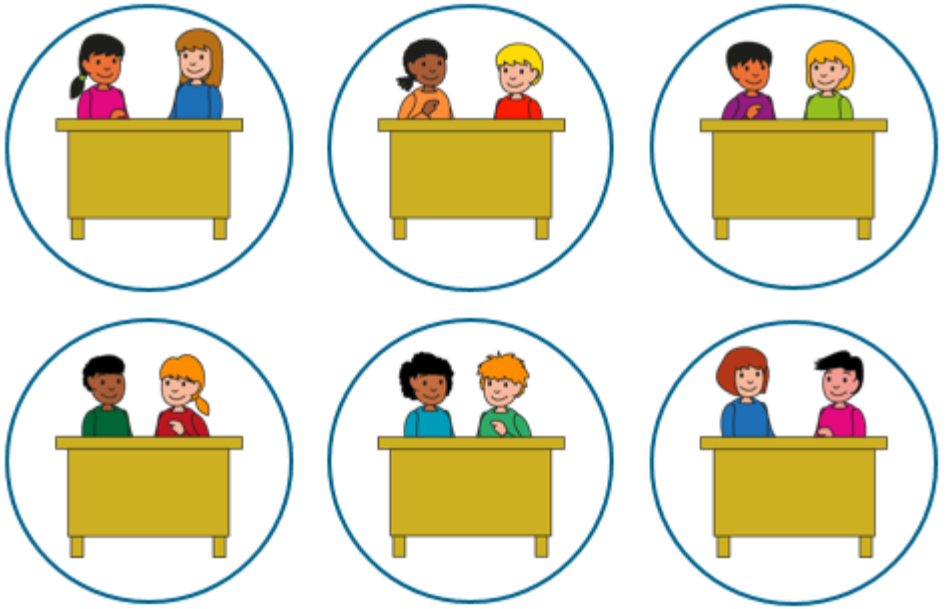
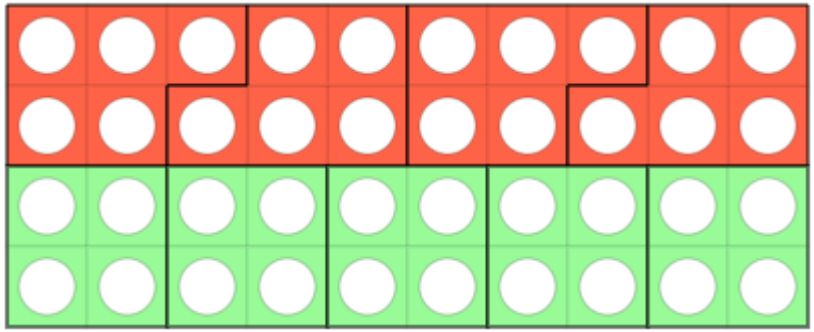
12 ÷ 4 = 3

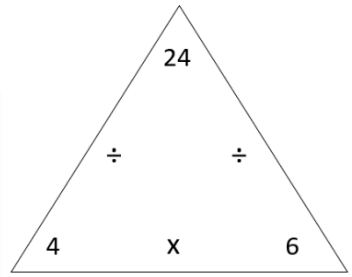
4 x 3 = 12

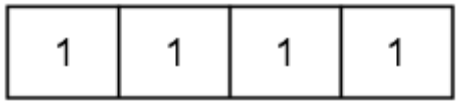
12 ÷ 3 = 4

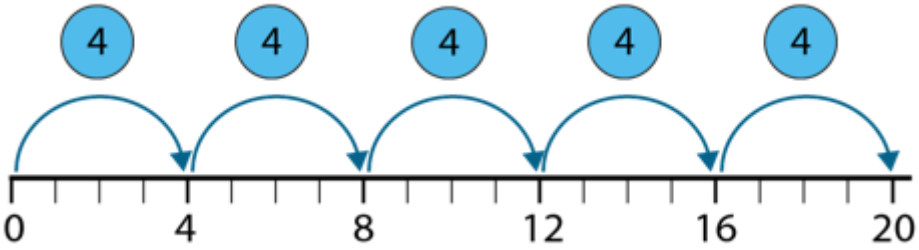
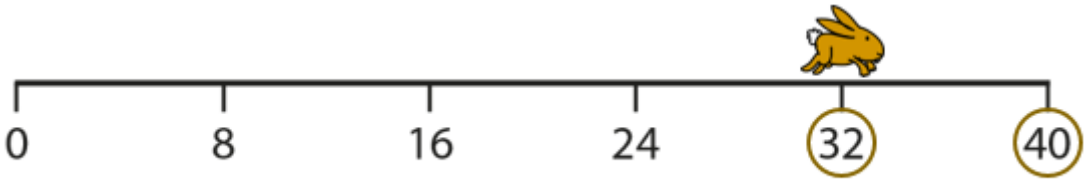
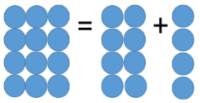




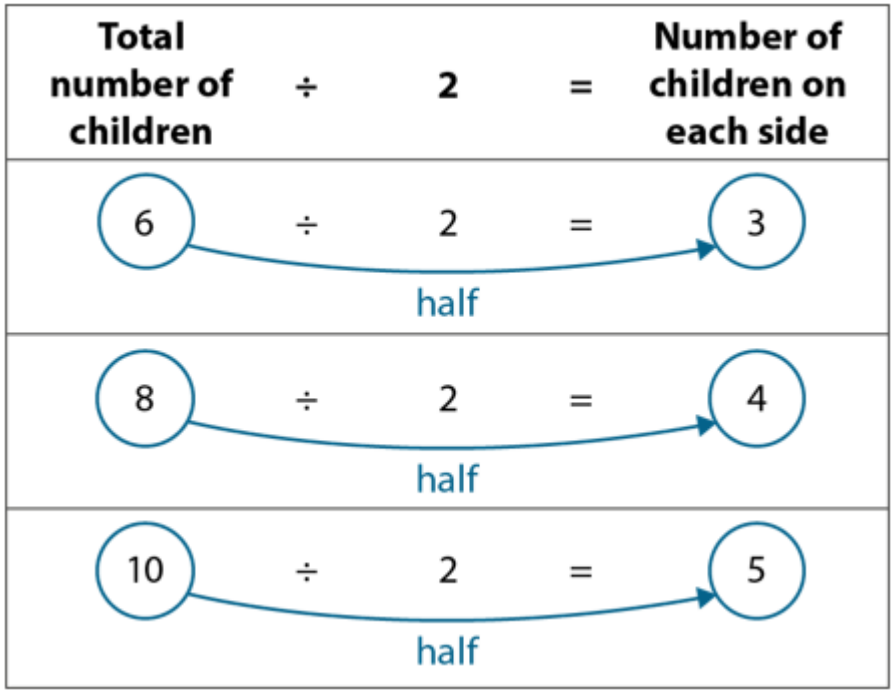
Understand multiplication as group size x number groups NCETM 2 .2 (be careful with some images) Know that the group size and number of groups are both factors and they can be swapped (commutative law)	Group size 2 Number of groups 6 2, 6 times 2 x 6  5 , 4 times 5 x 4 4, 5 times 4 x 5 

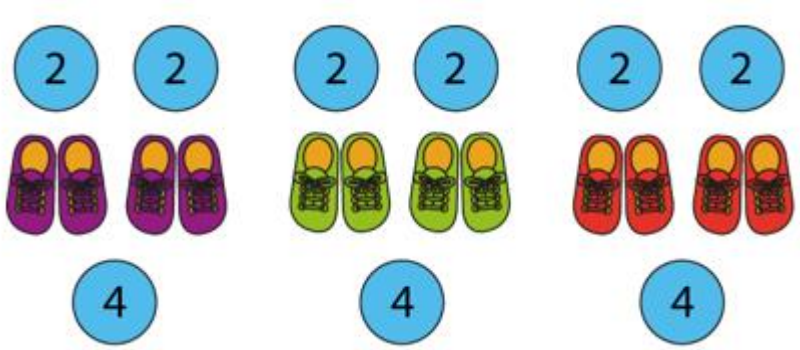
Can show multiplication and division fact families	24 ÷ 4 = 6 24 ÷ 6 = 4 6 x 4 = 24 4 x 6 = 24 
Express multiplication and division as a bar model	**24** **4** **4** **4** **4** **4** **4** 6 x 4 = 24 24 ÷ 4 = 6 **24** **6** **6** **6** **6** 4 x 6 = 24 24 ÷ 6 = 4

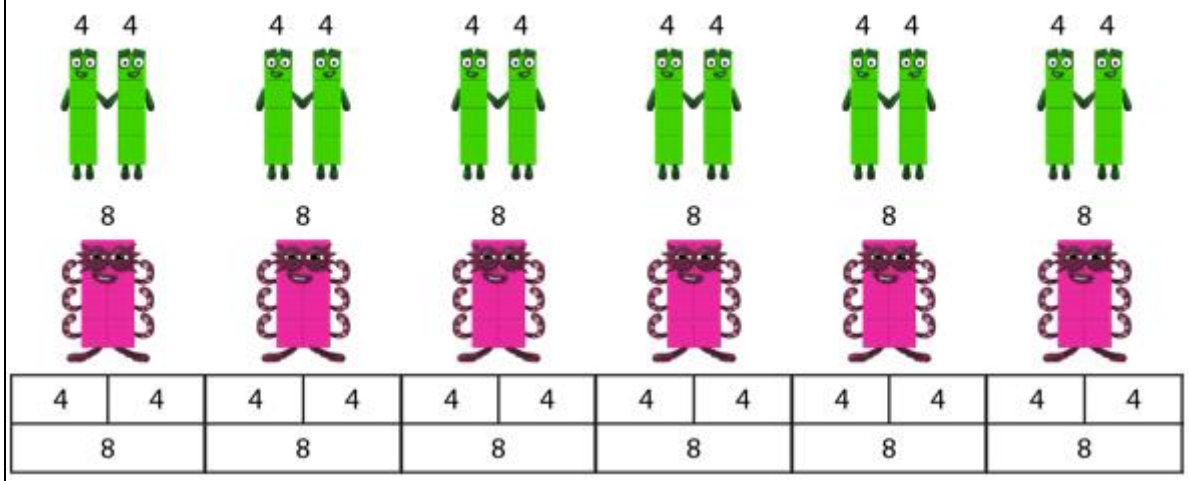
Understand the concept of multiplying by 1 and by 0 NCETM 2.2	 5 + 5 + 5 5 x 3 = 15  1 + 1 + 1 + 1 1 x 4 = 4	 0 + 0 + 0 0 x 3 = 0
Know that multiplication is commutative, and division is not	24 ÷ 4 is possible but not 4 ÷ 24 use counters or sweets to demonstrate	

Understand what a multiple is and when you are skip counting you are counting in multiples	
Add to the create the next multiple and this can be used to make calculations easier NCETM 2.10 and 2.7 Distributive law	8 x 5 = 8 x 4 + 8 = 40 + 8 8 x 4 = 32  4 x 3 = 4 x 2 + 4 
Subtract to the create the previous multiple and this can be used to make calculations easier NCETM 2.10 and 2.7	2 spiders crawl away. How many legs left? 8 x 6 – 8 x 2 = 8 x 4
Know that doubling is the same as multiplying by 2	

Know that halving is the same as dividing by 2
NCETM 2.6



Link 4s and 2s and 8s by doubling and halving NCETM 2.7	 12 2 2 2 2 2 2 4 4 4



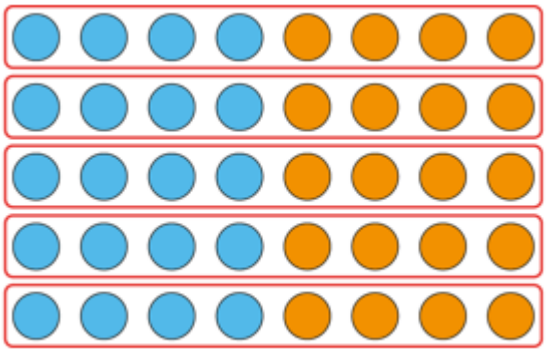
$5 \times 2 = 10$

half double

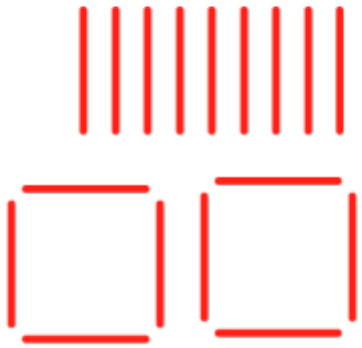
$5 \times 4 = 20$

half double

$5 \times 8 = 40$

		
Know doubles and halves to 50		
Know that division can be expressed as grouping and sharing NCETM 2.6	Image from WR Y3 use concrete apparatus to make groups of and share out.	Circle the buttons in groups of 4. Can you also split the buttons into 4 equal groups? How is this the same? How is it different?
Understand the concept of dividing by 1 and itself		
Be familiar with the language dividend ÷ divisor = quotient NCETM 2.6		

30	÷	5	=	6
dividend	÷	divisor	=	quotient

Know the divisibility rules for 2s 4s and 8s NCETM 2.7	9 sticks, how many squares?  Investigate with concrete materials – leads on to remainders next term. $9 = 2 \times 4 + 1$

Spring 1	**Y3 Multiplication and Division**
Prior Learning	**Children should now be fluent in their 3s 4s and 8s multiplication and division facts** **They should know that multiplication is commutative, and that division isn't** **They should understand multiplication as repeated addition** **Understand multiplication and division as an array** **Understand the concept of multiplying by 1 and by 0** **Understand the concept of dividing by 1 and itself** **Be able to make some links with doubling and halving**
Continuous Provision	**All the times tables now know 2s 3s 4s 5s 8s and 10s Plus addition and subtraction skills from previous Autumn Term learning to keep on the boil**

<table>
<tr><td>Key Vocabulary</td><td>Use group size and number of groups 3, 4 times
Use the language of dividend ÷ divisor = quotient factor x factor = product
Understand and use the word multiple
Understand and use multiply, divide, groups of, lots of, grouping and sharing (quotitive and partitive division)
Use unitising language 30 x 4 3 tens, 4 times</td></tr>
<tr><td>Key Facts</td><td>2s 5s and 10s times tables 3s 4s and 8s times tables
Understand the concept of multiplying by 1 and by 0
Understand the concept of dividing by 1 and itself
Use fact triangles to make multiplication and division fact families and extended fact families
Make links with doubling and halving including doubling and halving factors to get the same answer e.g., 5 x 4 = 10 x 2 = 20
Use the distributive law to make calculations easier 7 x 8 can be 5 x 8 + 2 x 8 (use arrays) NCETM 2.10
Make links with doubling and halving (in Y3 and Y4 through links with 4 x and 8x and 3x and 6x and in UKS2 doubling and halving factors)
Be able to discuss which methods are efficient and error proof or error prone.
Be able to multiply 3 numbers
Use multiplication in the context of scaling (3 times as many, 10 times bigger problems)</td></tr>
<tr><td>Skills and Knowledge: By the end of the teaching sequence children should…</td><td>Examples and models and images to use</td></tr>
<tr><td>Multiply a multiple of 10 by 1d number and make the link with place value and scaling 2 x 6 = 12 2 x 60 = 120 3 x 5 = 15 30 x 5 =</td><td><table>
<tr><td colspan="4">12</td></tr>
<tr><td>3</td><td>3</td><td>3</td><td>3</td></tr>
<tr><td colspan="4">120</td></tr>
<tr><td>30</td><td>30</td><td>30</td><td>30</td></tr>
</table></td></tr>
</table>

150. This is key for the next step.

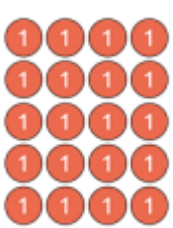
40 x 5 = 200 Can use coins as well as PV counters

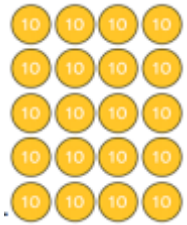
50 x 4 = 200

Each counter is 10 times the size. Misconception 40 x 50

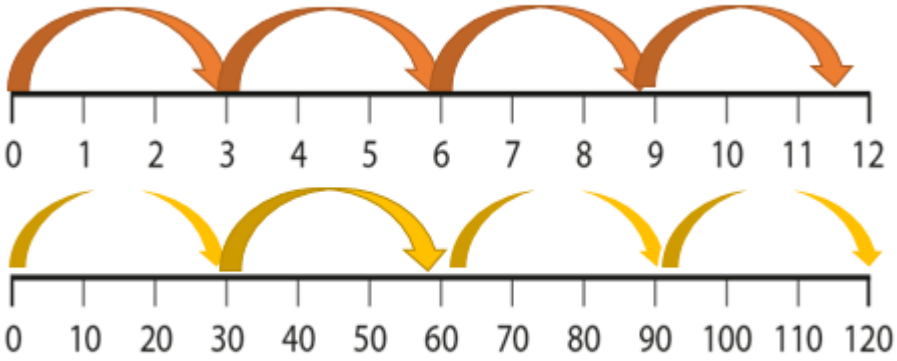
4 x 5 = 20

5 x 4 = 20

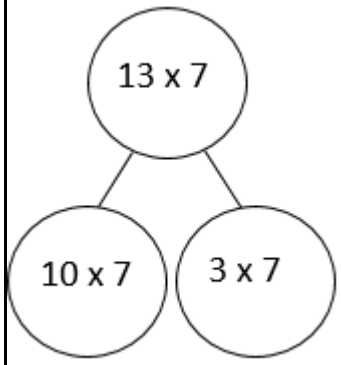
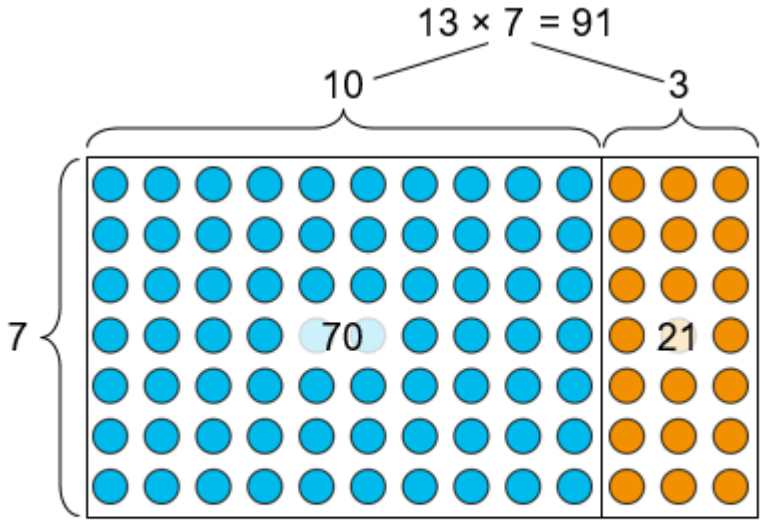
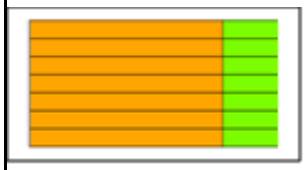
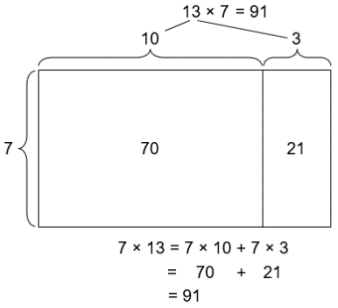
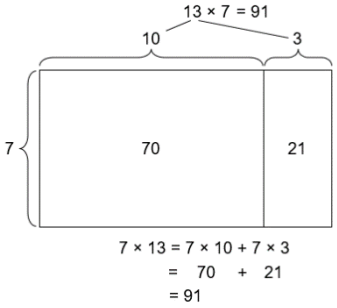


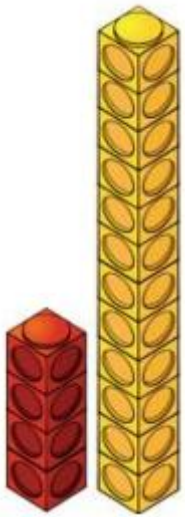
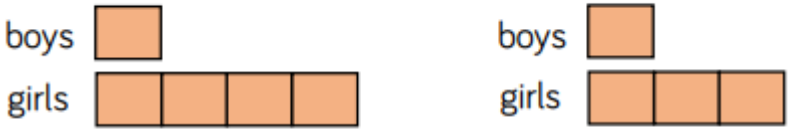


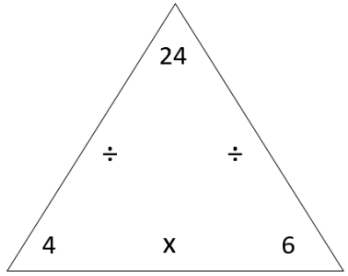
3 x 4 = 12



30 x 4 = 120

Use an array to multiply 2d by 1d	  $7 \times 13 = 7 \times 10 + 7 \times 3$ $= 70 + 21$ $= 91$
Use the area model/grid method to partition and multiply 2d numbers by 1d	  $7 \times 13 = 7 \times 10 + 7 \times 3$ $= 70 + 21$ $= 91$  $7 \times 13 = 7 \times 10 + 7 \times 3$ $= 70 + 21$ $= 91$
Choose an appropriate	

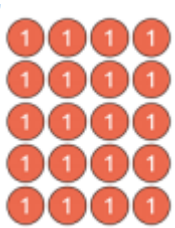
method to x 2d by 1d and discuss which is the most efficient and why 36 x 2 (double) 23 x 4 – (double then double again) 15 x 6 (15 x 3 = 45 so just double 45) 53 x 8 (area model)	
Understand scaling and how it relates to multiplication 4 x bigger – word problems and bar model problems see White Rose	 In a playground there are 3 times as many girls as boys.  Which bar model represents the number of boys and girls? Explain your choice.

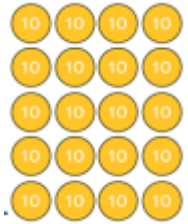
Understand correspondence problems 3 hats 4 coats – how many different outfits? See White Rose	
Know that division can be expressed as grouping and sharing NCETM 2.6	
Divide using times table knowledge 72 ÷ 8 = 9	24 ÷ 4 = 6 24 ÷ 6 = 4 Also link back to fractions of an amount ¼ of 24 is 6 
Divide 2d by 1d using place value knowledge 12 ÷ 3 = 4 so 120 ÷ 3 = 40. This is	<table><tr><td colspan="4">12</td></tr><tr><td>3</td><td>3</td><td>3</td><td>3</td></tr></table>

key for the next step.	

200 ÷ 4 =50 20 ÷ 4 =5

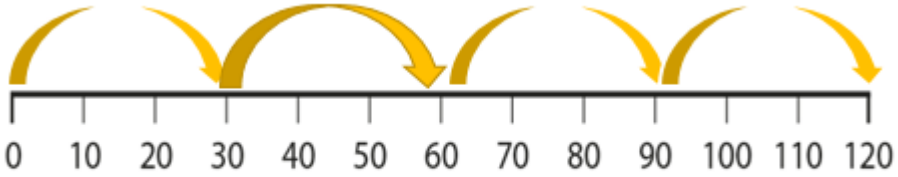
200 ÷ 5 = 40 20 ÷ 5 = 4



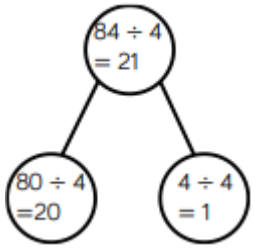
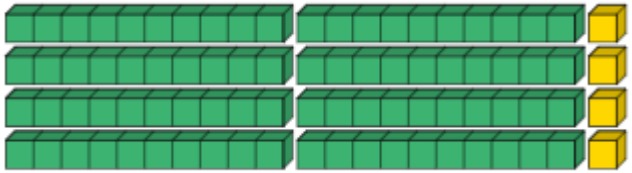
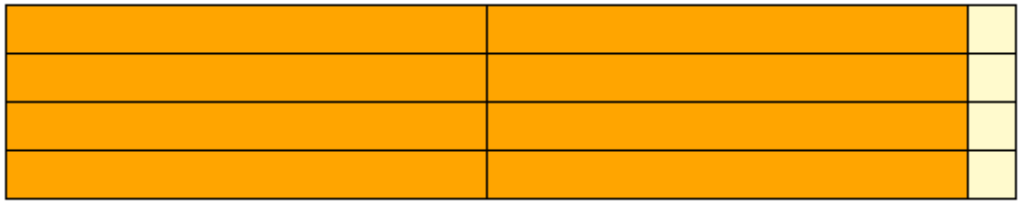


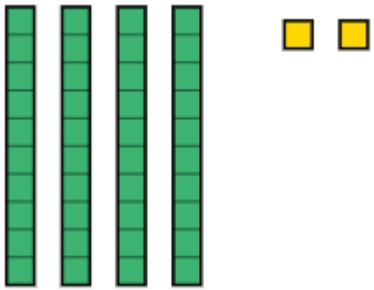
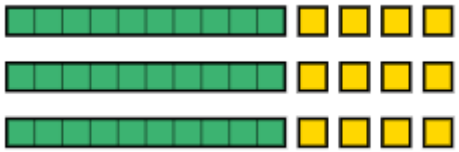
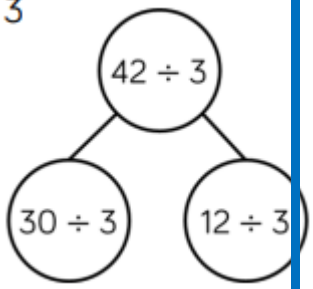
120			
30	**30**	**30**	**30**

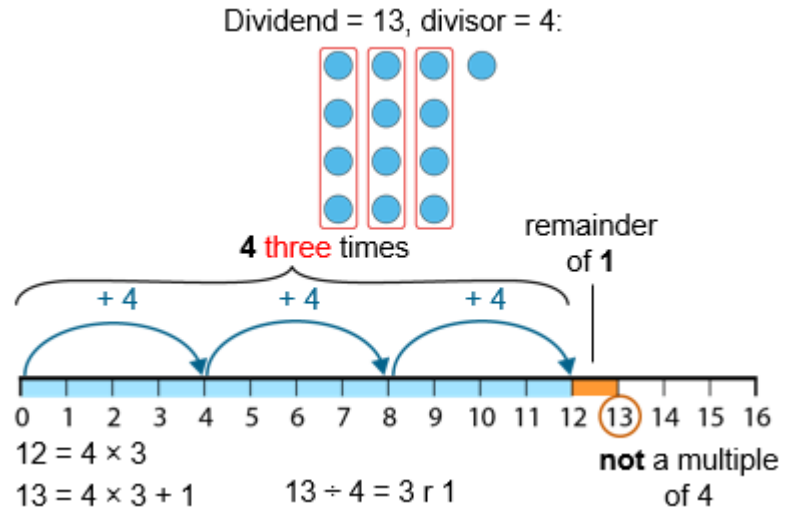
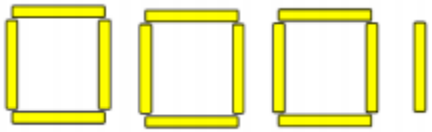
12 ÷ 4 = 3



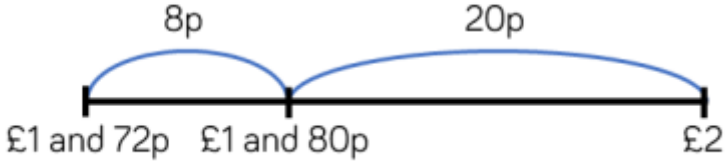
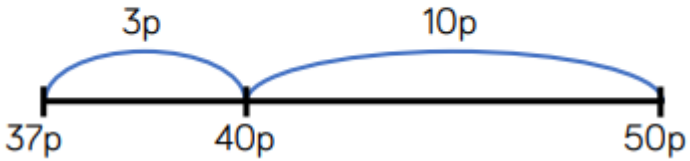
120 ÷ 4 = 30

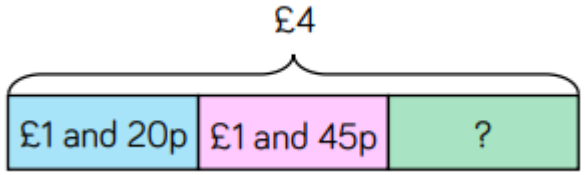
Divide 2d by 1d using concrete apparatus partitioning into tens and ones.	$84 \div 4 = \boxed{21}$ Like multiplication most 2d by 1d divisions can be solved a different way. E.g. this can easily be solved by halving and halving again. Whilst teaching this method maintain that discussion of different methods. Counting in 4s also a method but it is not efficient.  8 tens ÷ 4 = 2 tens 4 ones ÷ 4 = 1 one 84 ÷ 4 = 21   The same image can be shown with dienes and Cuisenaire to show inverse of the area model 21 x 4 = 84

Divide 2d by 1d using partitioning into known multiples of the divisor. Use lots of practice with dienes. Some children may move on to a jottings version of this once the concept is secure.	Exchange a ten for 12 ones  42 ÷ 3  / 3 

Division with remainders NCETM 2.12 This really helps secure the concept of division so may be helpful at the beginning of the division unit.	  13 ÷ 4 making squares and triangles with lollipop sticks to show the concept of remainders. Move on to showing on a number line and array with concrete apparatus.
Spring 1	**Money**
Prior Learning	**Recognise coins and notes** **Count money e.g., count in2s 5s and 10s using coins** **Find change from a pound (link to PV to 100)** **Find totals** **Find the difference**

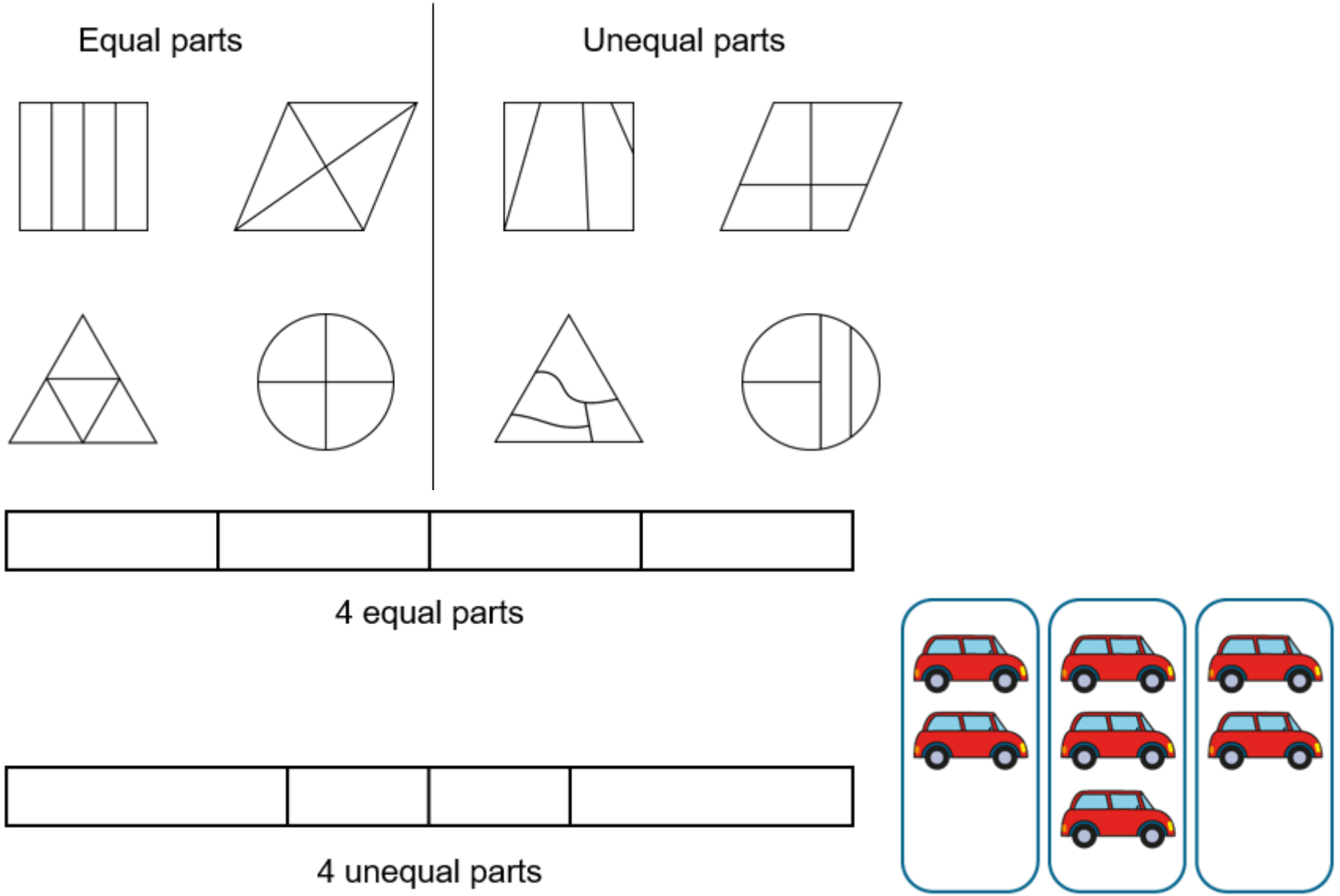
	Check White Rose Y2
Continuous Provision	**Times tables / addition and subtraction strategies**
Key vocabulary	**Pounds pence pennies change value**
Key facts	**Money is a good thing to have on the boil and things like counting in 2s 5s and 10s can be used when reviewing times tables.** **Decimals are not used in money until Y4 when it is introduced with tenths and hundredths, but children should be able to convert between pounds and p** **Children should be confident in adding and subtracting money using a variety of strategies.** **They should be able to solve 2 step problems and give change** **They should be able to use the 4 operations in the context of money and links made to multiplication and division.** **Links should be made to PV to 100 and 1000.** **Part whole models and bar models should be used.**
Skills and Knowledge: By the end of the teaching sequence children should…	
Recognise all UK coins and notes	**Where possible real money or practise money should be used.**
Know how many pence in a pound	
Know how many 2ps 5ps 10ps 20ps and 50ps in a pound	

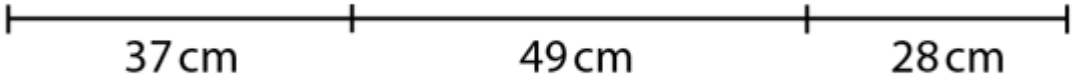
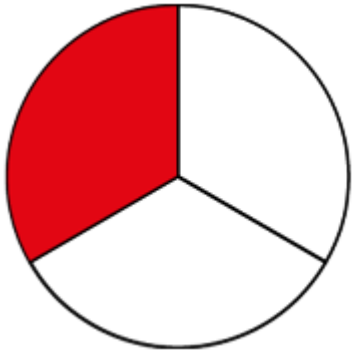
Convert to from pounds to pence and vice versa.	What is the total of the coins shown? Can you group any of the coins to make 100 pence? How many whole pounds do you have? How many pence are left over? So there is £____ and ____ p.
Add/subtract pounds and pence using ENL strategies	oney. Tommy has £1 and 72p. Rosie has £2 How much more money does Rosie have than Tommy? 
Be able to give change	Mo buys a chocolate bar for 37p. He pays with a 50p coin. How much change will he receive? 

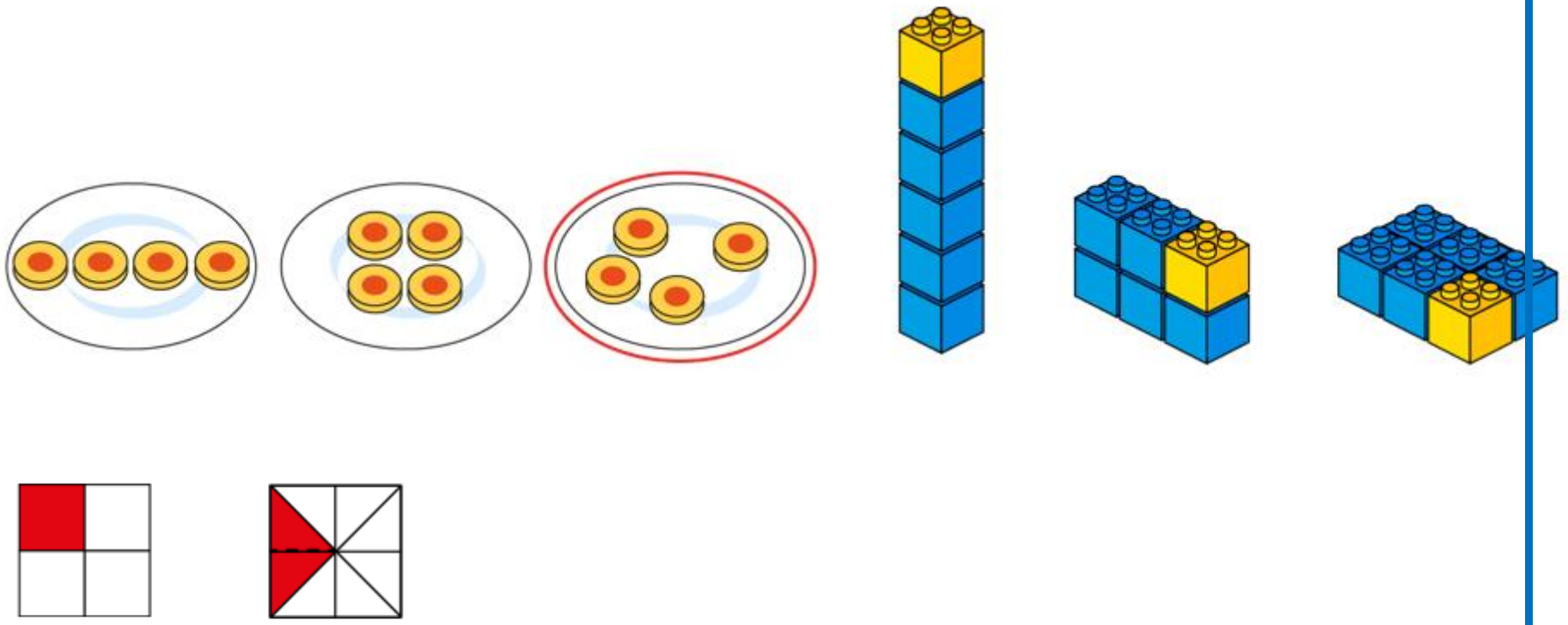
Be able to solve a variety of 1 step and 2 step problems using the 4 operations.	Amir has £4 He buys a pencil for £1 and 20p and a book for £1 and 45p. 
Spring 2	**Y3 Fractions**
Prior Learning	**Children should now be fluent in their 2s 3s 4s 5s 10s and 8s multiplication and division facts.** **Know that a fraction is made up of equal parts** **Recognise and find halves, quarters, and three-quarters in a variety of contexts** **Count in known fractions** **Understand equivalence of half and two quarters** **Refer to NCETM Y2 PD materials and Dfe Ready to Progress Y1 and Y2 and Y3 Fractions for interventions and prior learning.**
Continuous Provision	**All times tables now know 2s 3s 4s 5s 8s and 10s Plus addition and subtraction skills from previous Autumn Term learning to keep on the boil**
Key Vocabulary	**Equal parts unequal parts numerator denominator whole part** **Check that children can say, write and spell fractions correctly especially quarters**
Key Facts	**This is the first formal learning on fractions, and it may be a good year since any fraction learning has been done so please refer to prior learning and mak secure first.** **Key that fractions are presented in a variety of contexts from shape, amount, measures number lines arrays** **Use arrays to make links with multiplication and division** **Be able to count in fractions on a number line** **Know that when the numerator and denominator are equal then the fraction is a whole**
Skills and Knowledge:	**Examples and models and images to use**

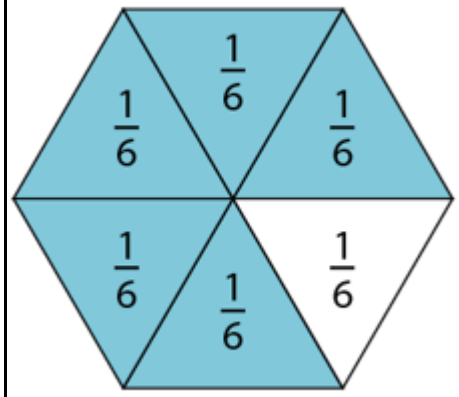
By the end of the teaching sequence children should…	

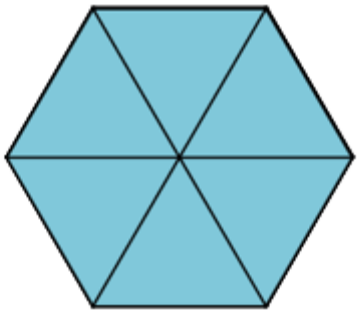
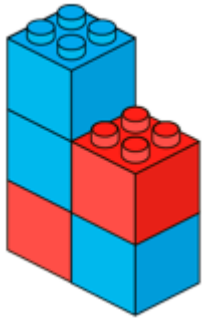
Understand fractions as equal parts of a whole NCETM 3.1 **REVIEW**



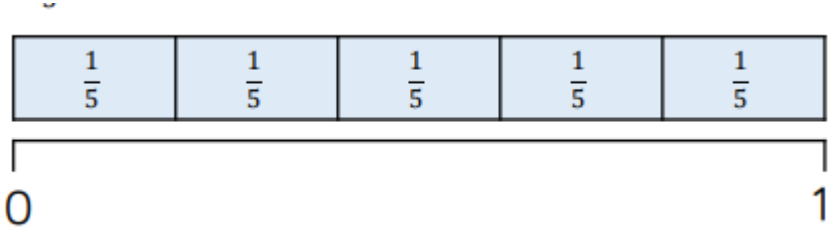
	
Be able to construct and interpret unit fraction NCETM 3.2 **REVIEW**	*What does the 3 represent?* *What does the 1 represent?* *The whole has been divided into three equal parts.* *One of the parts has been shaded.* 
Understand the language of numerator and denominator NCETM 3.2	$\frac{1 \leftarrow \text{numerator}}{3 \leftarrow \text{denominator}}$ The denominator is 3 because the whole is divided into 3 equal parts. The numerator is 1 because 1 part is shaded.

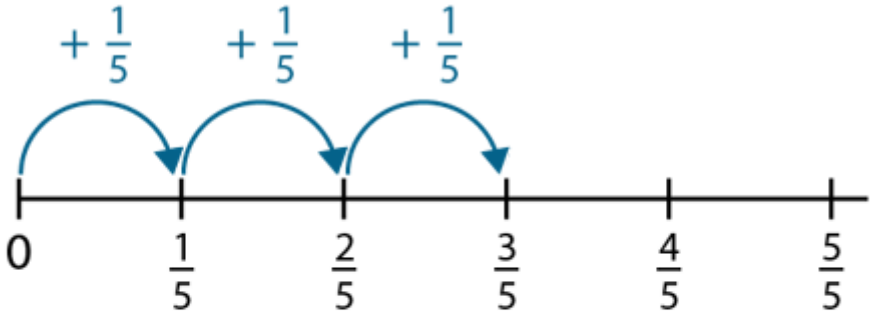
Be able to construct and interpret unit fraction NCETM 3.2 in different contexts	

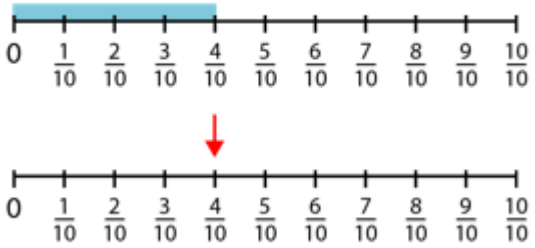
Be able to construct and interpret non-unit fractions NCETM 3.3	 *What does the '6' represent?* *What does the '5' represent?* *The whole has been divided into ___ equal parts.* *___ of the whole parts are shaded; that is ___ of the whole.*

Know that when the numerator and denominator are the same then this is a whole. That when you have all the parts you have the whole. NCETM 3.3	 6 one-sixths = six-sixths
Be able to construct and interpret non-unit fractions in different contexts NCETM 3.3	 using measure and objects

Count in fractions and plot them on a number line NCETM 3.3	Fold up pieces of paper then draw a number line. Also shows repeated addition which links to multiplication

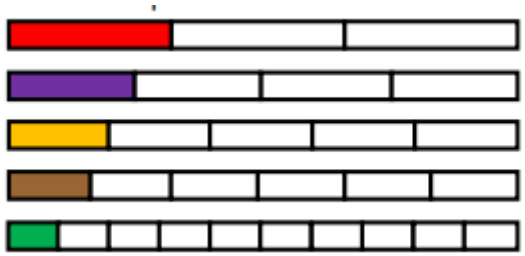
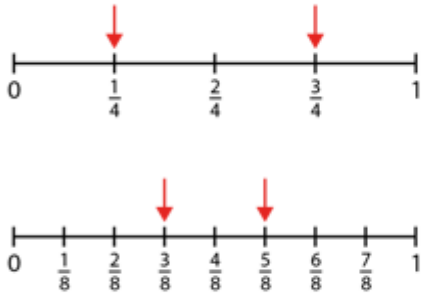


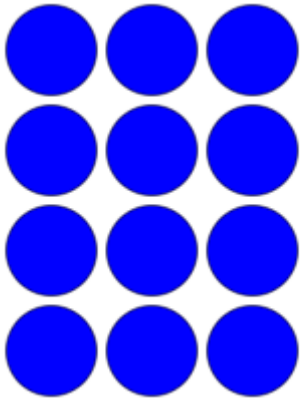
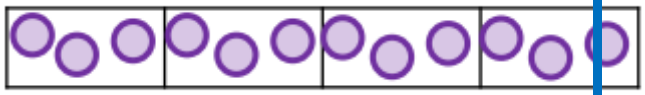
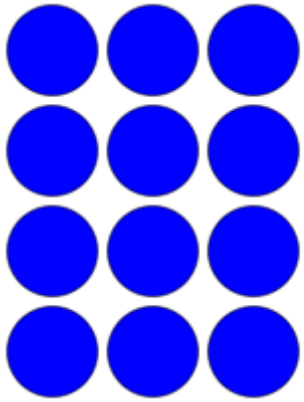
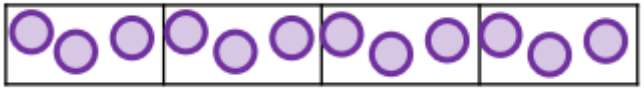


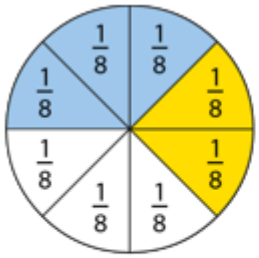
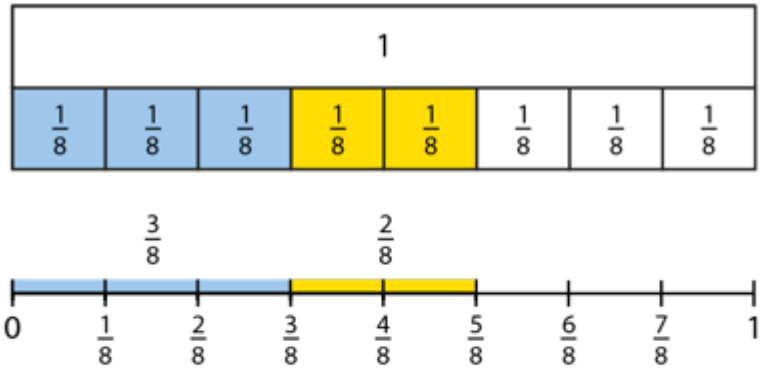


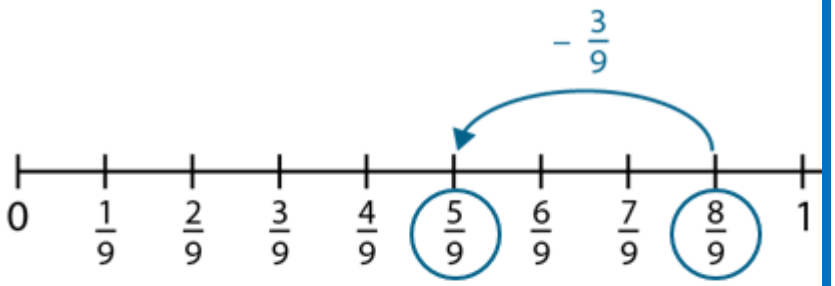
$$\frac{1}{5} + \frac{1}{5} + \frac{1}{5} = \frac{3}{5}$$

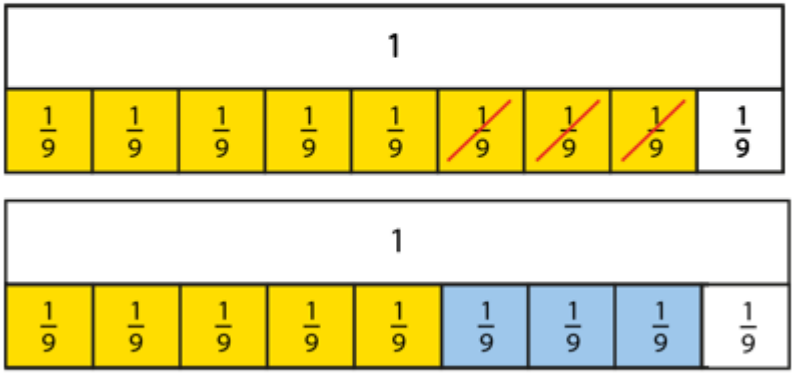
$$\frac{3}{5} = \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$$

Compare and order unit fractions with different denominators and understand that the greater the denominator the smaller the equal parts and the smaller the fraction.	Use strips of paper to make the fractions and then compare using < > and = (equivalent fractions will be taught in detail in Y4 Use Cuisenaire rods 	When the numerators are the same, the __ denominator, the _____ the fraction.
Compare and order non- unit fractions with the same denominator and understand that the greater the numerator the greater the fraction	 $\frac{1}{4} < \frac{3}{4}$ $\frac{3}{8} < \frac{5}{8}$	
Unit fractions of amounts – link to multiplication and division – use the bar model	12 3 3 3 3	

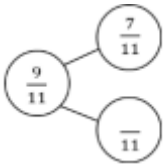
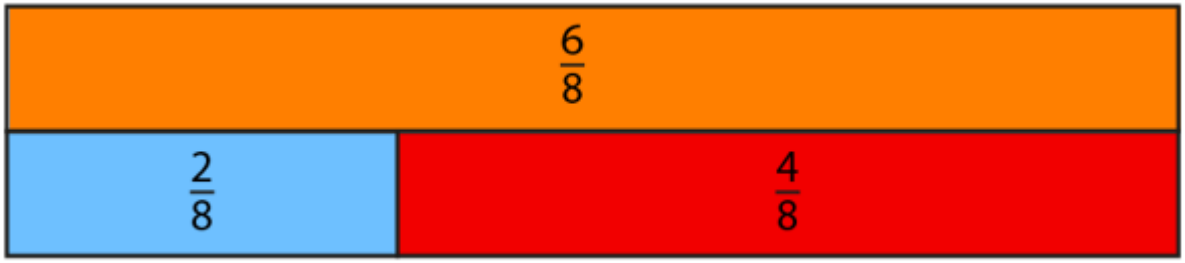
	Array into a bar modelthen to just a bar model  
Find non-unit fractions of an amount	<table><tr><td colspan="4">12</td></tr><tr><td>3</td><td>3</td><td>3</td><td>3</td></tr><tr><td colspan="3">9</td><td></td></tr></table> ¾ of 12 is 9 Array into a bar modelthen to just a bar model  

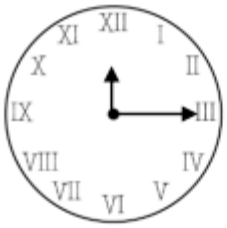
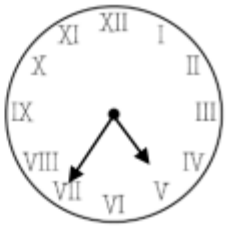
Add and subtract fractions with the same denominator within the whole	  $\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$





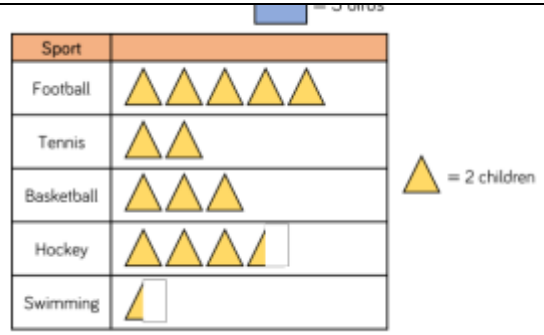
$\frac{8}{9} - \frac{3}{9} = \frac{5}{9}$

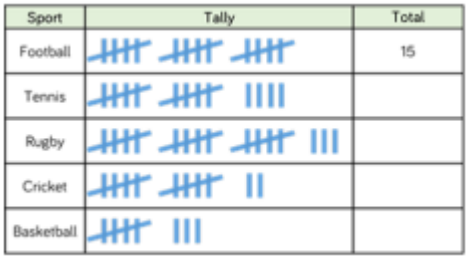
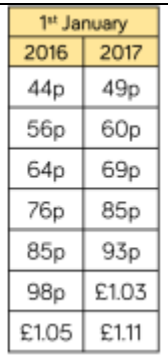
	 Use part whole model as in whole number addition and subtraction and write 4 calculations 
Be able to tell the time on an analogue and digital clock using quarter to and quarter past REVIEW	Match the clocks to the correct time. Quarter to four Quarter past four Quarter to three Quarter past three

Be able to tell the time on an analogue and digital clock to 5 minutes	  What time is shown on each clock? _____ minutes past _____ _____ minutes to _____ Use real clocks and different types of clocks
Be able to tell the time on an analogue and digital clock to the minute	Draw the hands on the clock from the following times. Four minutes to 4 24 minutes to 8 24 minutes past 8
Use am and pm	Sort the times from latest to earliest. 5:30 p.m. 9:45 a.m. 9:45 p.m. 10:23 a.m. 7:31 a.m. 10:13 p.m. 8:30 a.m. 6:32 a.m. 12:24 a.m. 8:55 p.m. 2:11 a.m. 7:40 a.m. also make on real clocks to compare
Use the 24 hour clock	Make a timetable of the day and put in 12 hour and 24 hour clock

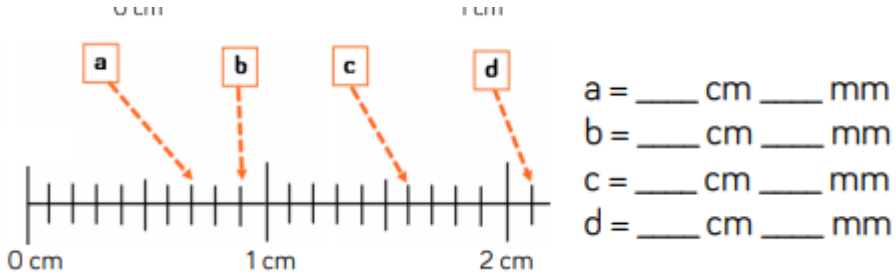
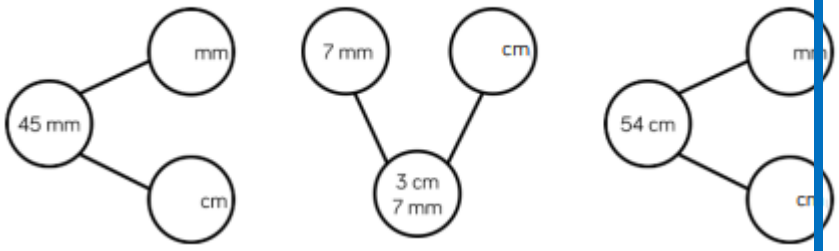
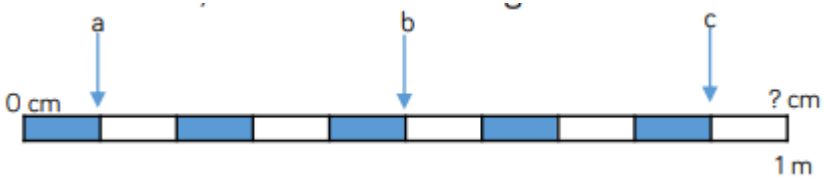
	Match the times to the clocks showing the same time. 9 o'clock in the morning 19 : 15 Half past 3 in the afternoon 09 : 00 Quarter past 7 in the evening 15 : 30
Know how many minutes in an hour/ seconds in a minute	
Count time in seconds	Link to Science
Know how many hours in day/2 days	Complete the statements. 1 day = 24 hours ____ days = 120 hours 2 days = ____ hours ____ days = 60 hours ____ days = 240 hours 20 days = ____ hours

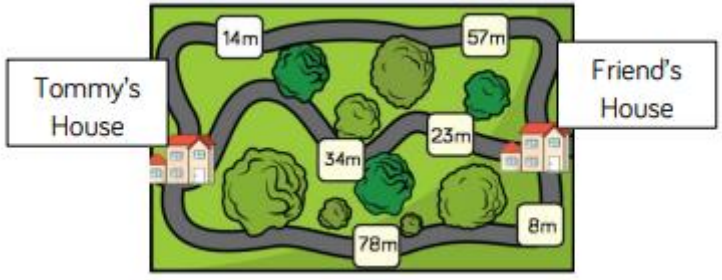
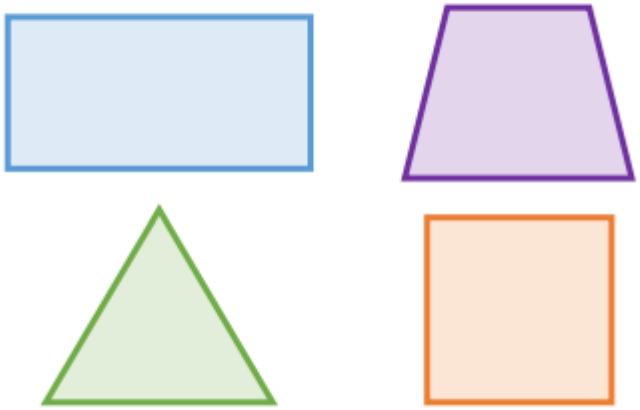
Know how many months/days in year / 2 years	There are _____ days in a year. There are _____ months in a year. There are _____ days in a leap year. There are _____ days in a week. Leap years happen every _____ years. 7 365 4 366 12 use real calendars
Find the duration of activities	Calculate the duration of the TV programmes. TV Programme / Start Time / Finish Time / Duration Pals / 06:30 / 07:30 / Dennis the explorer / 15:15 / 18:15 / The football show / 12:00 / 14:00 / An adventure / 10:40 / 12:40 /
Find start times and end times	Use the symbols <, > and = to compare the following durations. 2:00 p.m. - 6:00 p.m. ◯ 08:00 a.m. - 12:00 p.m. 07:30 a.m. - 09:30 a.m. ◯ 11:40 a.m. - 02:40 p.m. 03:30 a.m. - 05:00 p.m. ◯ 03:30 p.m. - 05:00 a.m.
Summer 1	**Y3 Statistics**
Prior Learning	**Children should be familiar with tally charts and pictograms and use them to consolidate learning on 2s 5 s 10s and fractional quantities. Make sure there images and plenty of 'traps'**

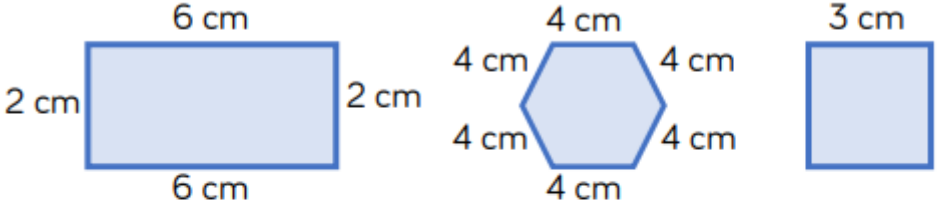
Continuous Provision	**Fractions and thinking ahead – 2D shapes**
Key Vocabulary	**Key axis bar tally title**
Key Facts	Children should be able to read, interpret and draw the 3 types of charts. They should be taught to look at the key first and the axis for a bar chart so that th assumptions.
Skills and knowledge By the end of the teaching sequence children should…	
Draw and interpret tally charts -see white rose	Which is the most popular sport? How many children voted for football and swimming altogether? What could the title of this pictogram be? 

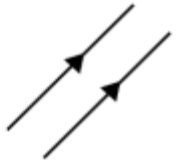
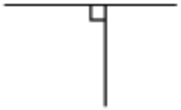
Draw and interpret pictograms	4 classes are recording how many books they read in a week. Here are the results of how many books they read last week. • Which class read the most books? • Which class read the least books? • How many more books did Class 4 read than Class 2?
Draw and interpret bar charts	Here is a tally chart showing the number of children in each sports club. Draw a bar chart to represent the data. 
Interpret tables to answer one and two step problems	The table shows the increase in bus ticket prices. • The cost of Ron's new ticket is 60p. How much was his ticket last year? How much has the price increased by? • Which ticket price has increased the most from 2016 to 2017? Which ticket price has increased the least? 
Summer 1	**Y3 Length and perimeter**
Prior Learning	**Children will have done a lot of comparing using comparative adjectives and some measuring with cm and m** **Children will need knowledge of addition and subtraction strategies as well as secure PV knowledge**

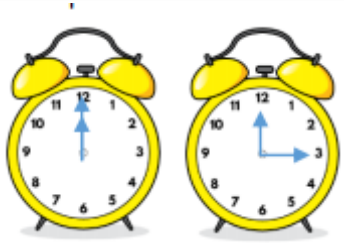
1st January	
2016	2017
44p	49p
56p	60p
64p	69p
76p	85p
85p	93p
98p	£1.03
£1.05	£1.11

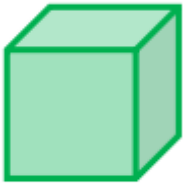
Continuous Provision	**Addition and subtraction strategies which will help with adding and subtracting lengths** **Place Value** **Review of common 2D shapes will help with perimeter**
Key Vocabulary	**Metre centimetre millimetre length height width**
Key Facts	**Be able to use a ruler correctly** **Know there are 100 cm in 1 m 10 mm in 1 cm 1000mm in 1m** **That perimeter is the total length of the outside of a 2D shape**
Skills and knowledge By the end of the teaching sequence children should…	**Examples and models and images to use**
Know how to use a ruler and know what mm, cm and m are.	1 m 53 = 153 cm 60 mm = 6 cm  a = ____ cm ____ mm b = ____ cm ____ mm c = ____ cm ____ mm d = ____ cm ____ mm Complete the part whole models.   What is the length of each pencil?

Convert between different lengths	
Compare and order different lengths	
Add/subtract lengths	
Measure perimeter	Use a ruler to measure the perimeter of the shapes. 

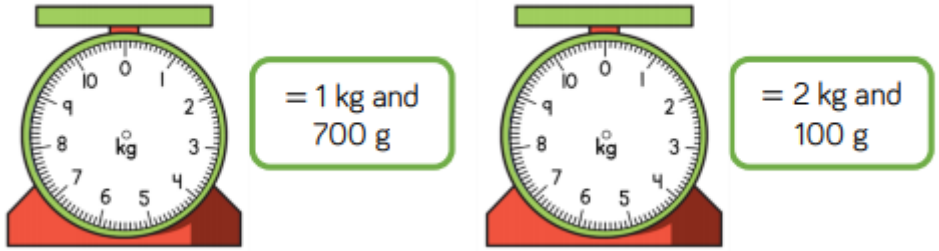
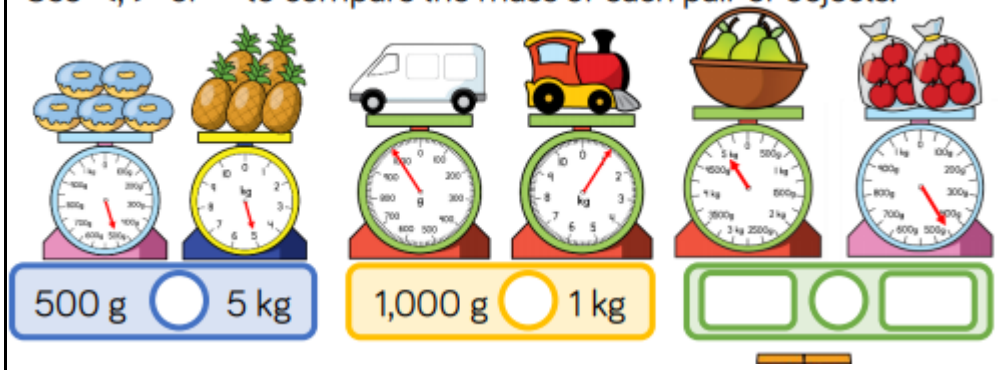
Calculate perimeter	Calculate the perimeter of the shapes.  Can you find more than one way to calculate the perimeter? Use two different methods to calculate the perimeter of the squares.
Summer 2	**Y3 Geometry – Properties of Shape**
Prior Learning	**Again, they might not have touched on shape for a while to good to introduce as continuous provision throughout the year- e.g shape of the week or ter they should be familiar with basic 2D shapes.**
Continuous Provision	**Keep reviewing key arithmetic strategies** **Time for use with turns**
Key Vocabulary	**2D 3D horizontal, vertical, parallel and perpendicular right angle obtuse angle acute angle net names of 2D and 3D shapes**
Key Facts	**Main properties of 2D and 3D shapes how to identify different angles**
Skills and knowledge By the end of the teaching sequence children should…	

Identify horizontal, vertical, parallel and perpendicular lines	 Lines that never meet are called _____ lines.  Straight lines that meet at a right angle are called _____ lines.
Draw accurately horizontal, vertical parallel and perpendicular lines	Label the horizontal and vertical lines in each of these images.
Identify line of symmetry	**Use folded shapes and paper**

Know different types of angles including right angles	Also use N S E W and use ½ ¼ and ¾ turns 	Find 3 acute angles and 3 obtuse angles in your classroom. Use your 'Right Angle Tester' to check.
Compare different types of angles		

Identify and draw accurately 2D shapes	Children should have knowledge of 2D shapes from Y2 but a full review will be needed first. Describe this quadrilateral. It has _____ angles. It has _____ right angles. It has _____ obtuse angle. It has _____ acute angle. It has _____ lines of symmetry.
Measure 2D shapes accurately	
Identify 3D shapes	 This shape is a _____. It has _____ faces. It has _____ edges. It has _____ vertices.
Construct 3D shapes	**Use nets and straws and blu-tak**
Summer 2	**Y3 Mass and capacity**
Prior Learning	**Like length and height they will have done a lot of comparing in KS1 but may need more time on formalising and using accurate measurement so spend a using scales etc.**
Continuous Provision	**Pick up on what children still need to work on before Y4**

Key Vocabulary	**Grams kilogrammes millilitres litre**
Key Facts	**1kg = 1000 g 1l = 1000 ml**
Skills and knowledge By the end of the teaching sequence children should…	

Understand g and Kg and when they are used	Do all of this with real objects and real scales Children need to know there are 1000g in 1 Kg Also talk about ½ kg = 500g 1 ½ kg 1 kg 500g No decimal notation Different increments should be used Draw an arrow on the scales to show the mass of each object.  Use <, > or = to compare the mass of each pair of objects. 
Convert between g and kg	
Compare g and kg	

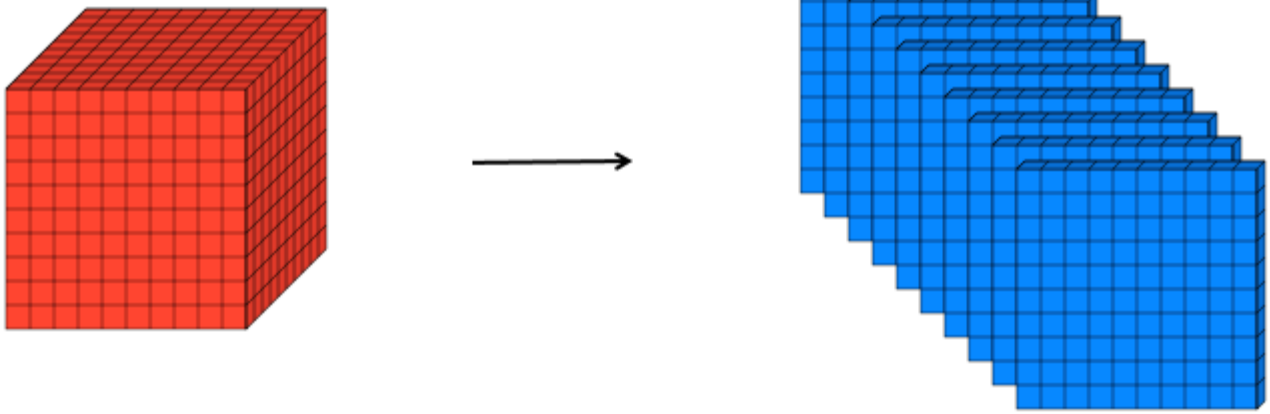
Understand ml and l and when they are used	Do all of this with and water and jugs. Juice/milk containers Children need to know there are 1000ml in 1 litre Also talk about ½ litre = 500ml 1 ½ litres 1 l 500 ml No decimal notation Different increments should be used Use <, > or = to compare the volume of liquid in each pair of containers. 800 ml ◯ 1 l _l and __ml ◯ 750 ml ◯ Identify what the scale is going up in to find out the volume in each container. Use the stem sentence. The increments are in ___. The volume is _____.
Convert between ml and l	
Compare l and ml	
Add/subtract using l and ml and g and kg	

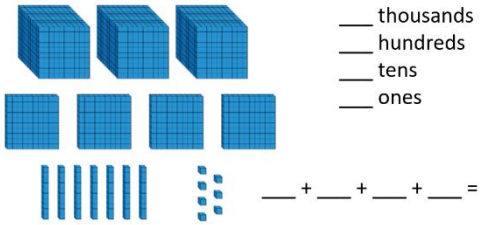
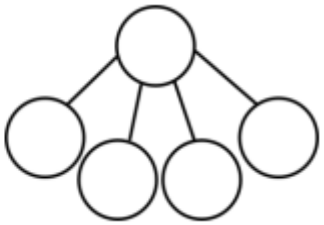
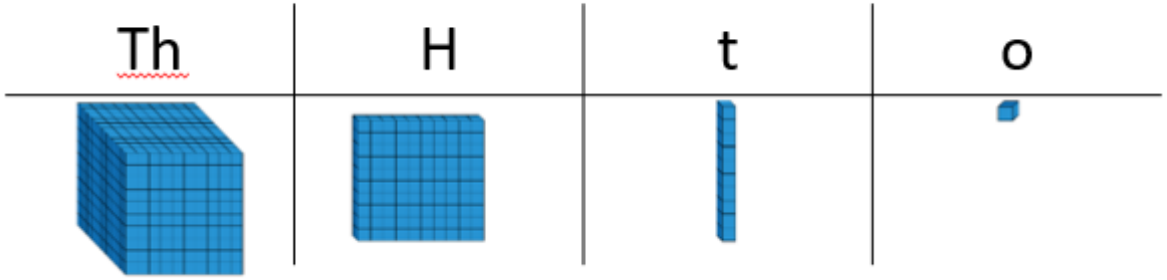
Fraction of an amount problems – WR Y3 fractions Spring	

Year 4 Progression

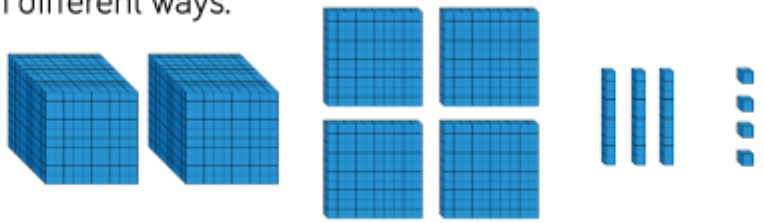
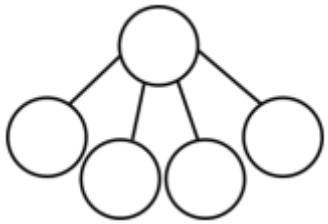
Autumn 1	Y4 Place Value
Prior Learning	Children must know their place value to 100 so add in as an intervention or a review to fill any gaps. They need to know basic place value e.g there are ten ones in one ten and ten tens in one hundred. They need to be able to count above 100 and read, write and recognise numbers to 1000. They need to be able to count in 2s, 5s and 10s and count in 50s. They should know half of 100 is 50 and half of 1000 is 500. They should know their number bonds to 100 See Dfe Ready to Progress Number and Place Value for Y2 and Y3 to fill gaps
Continuous Provision	Roman Numerals, Time measure and money (previous year groups) Times tables
Key Vocabulary	Use the language of unitising for example 70 is 7 tens 170 is one hundred and 7 tens and also 17 tens Ones tens hundreds thousands

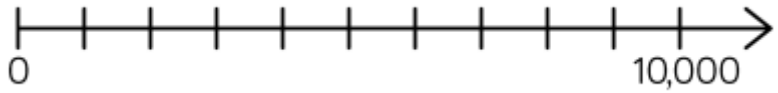
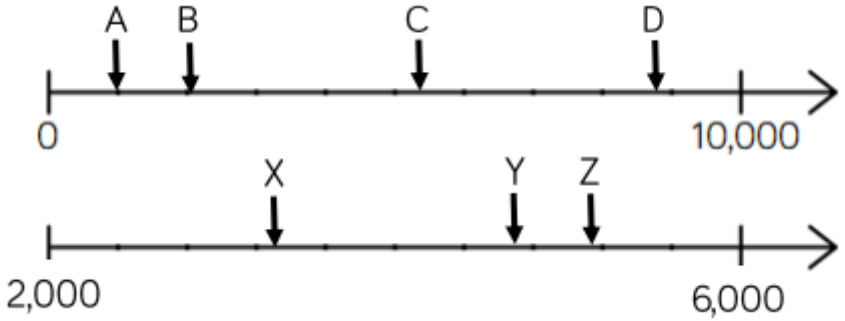
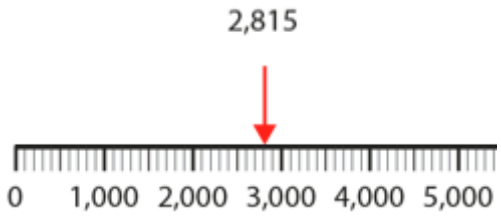
Key Facts	**Number bonds to 1000 tens and hundreds e.g. 640 + 360 = 1000 1000 more / less than any number**
Skills and Knowledge: **By the end of the teaching sequence children should…**	**Examples and models and images to use**

Know there are 10 thousands in 10,000 and 100 hundreds in 10,000	 <table><tr><td colspan="10">1,000</td></tr><tr><td>100</td><td>100</td><td>100</td><td>100</td><td>100</td><td>100</td><td>100</td><td>100</td><td>100</td><td>100</td></tr></table>
Count in 1000s to 10,000	<table><tr><td colspan="10">10,000</td></tr><tr><td>1,000</td><td>1,000</td><td>1,000</td><td>1,000</td><td>1,000</td><td>1,000</td><td>1,000</td><td>1,000</td><td>1,000</td><td>1,000</td></tr></table>

Represent 4 digit numbers to 10,000	 ___ thousands ___ hundreds ___ tens ___ ones ___ + ___ + ___ + ___ = 
Partition 4 digit numbers to 10,000 in a PV chart	

1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9

Partition 4 digit numbers to 10,000 in a variety of ways	Move the Base 10 around and make exchanges to represent the number in different ways.  Also partition with a part whole model 2000 + 400 + ☐ + 4 1000 + ☐ + ☐ + 14 1000 + 1300 + ☐ + ☐ 
Order 4 digit numbers to 10,000	Use a number line and place value columns to compare and order in different ways
Read and write 4 digit numbers to 10,000	
Count in and recognise multiples of 25	Link to fractions of an amount – quarters. Know that there are 4 25s in 100 so 4 250s in 1000. 25 50 75 100 125 150 50 100 150 200 250 300

Place any number to 10,000 on a numberline with 1000s	
Place any number to 10,000 on an ENL	
Know the next and previous multiple of 1000 and 100 NCE TM 1.22	 **previous** multiple of 1,000 2,000 < 2,815 < **next** multiple of 1,000 3,000

<table>
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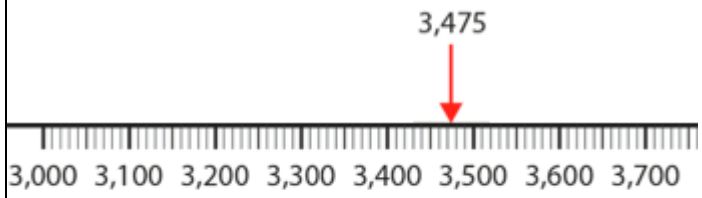
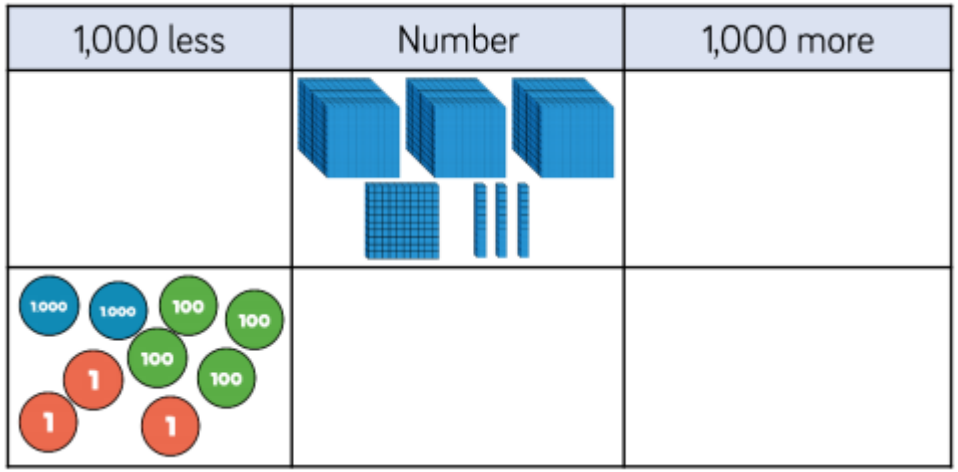
<td>


previous multiple of 100 < 3,475 < next multiple of 100
3,400 < 3,475 < 3,500
</td>
</tr>
<tr>
<td>Know 1000 more/less than any number to 10,000</td>
<td>
Use concrete apparatus to add and subtract 1000. Also show on ENL. What do they notice? Only 1000s change.



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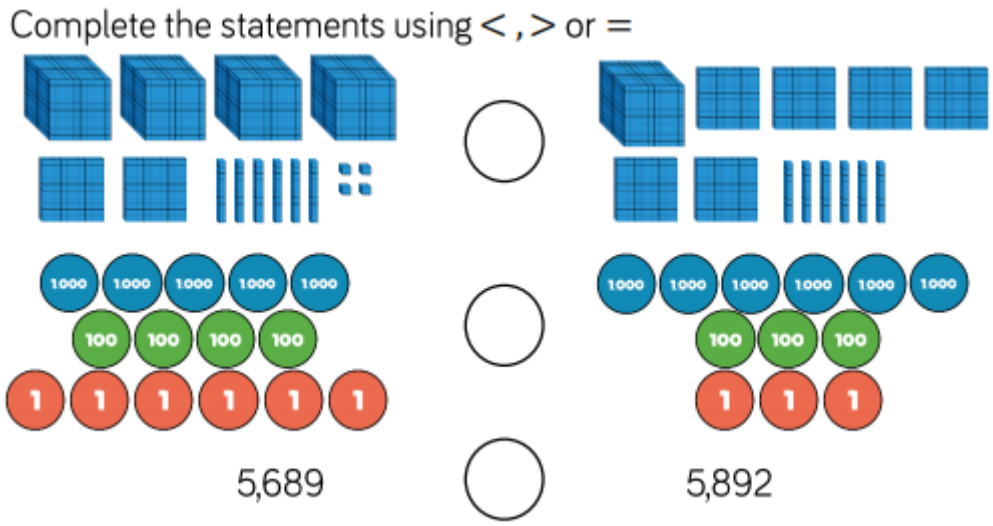
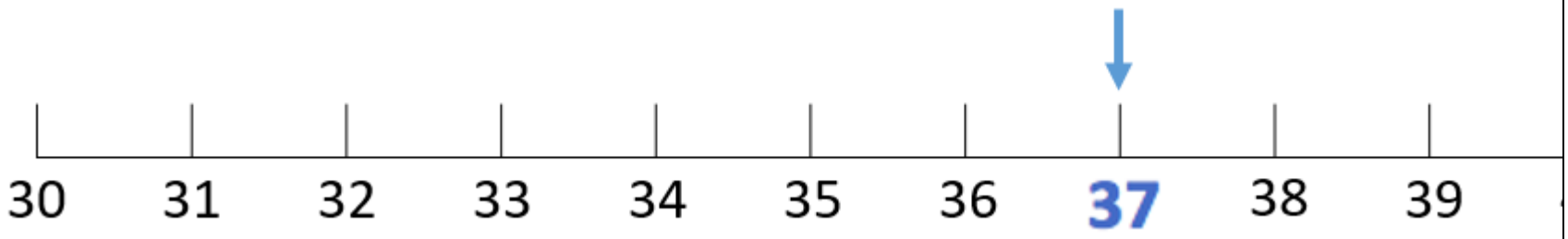
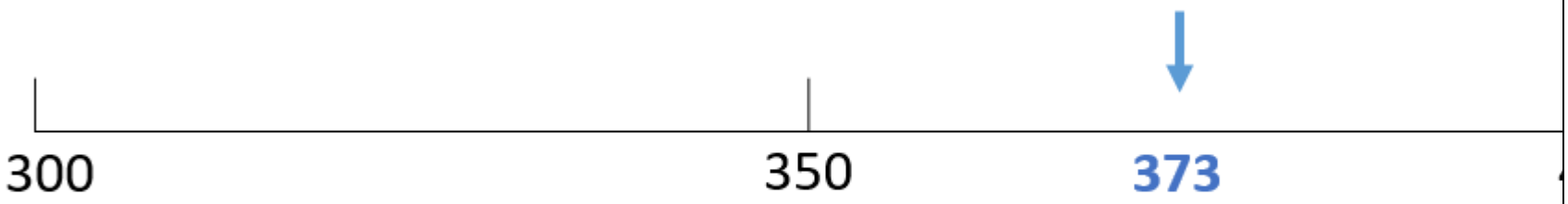
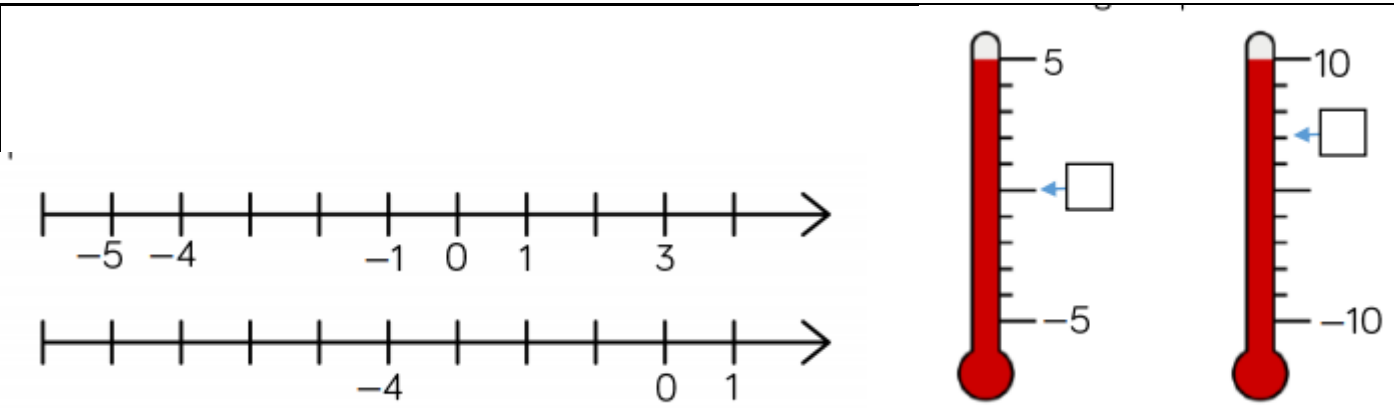
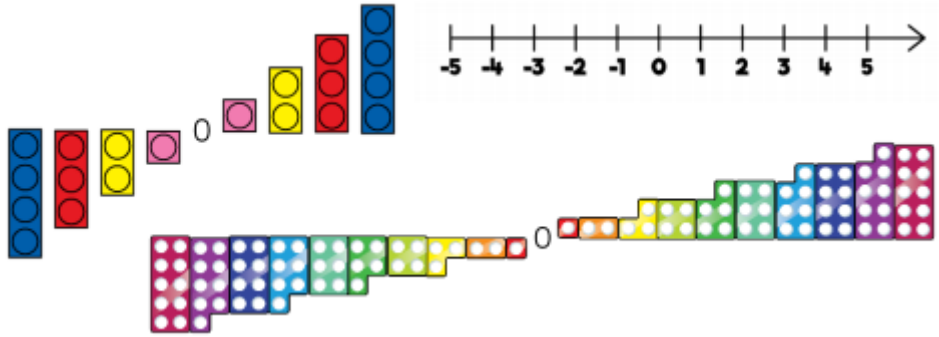
</table>

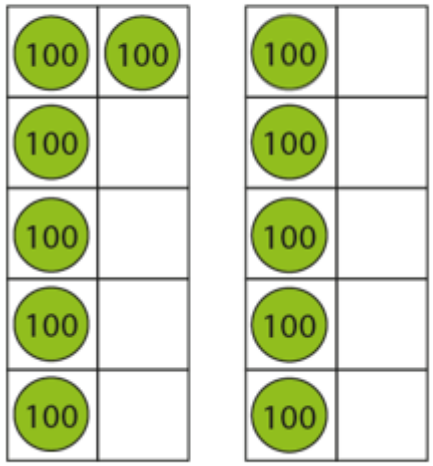
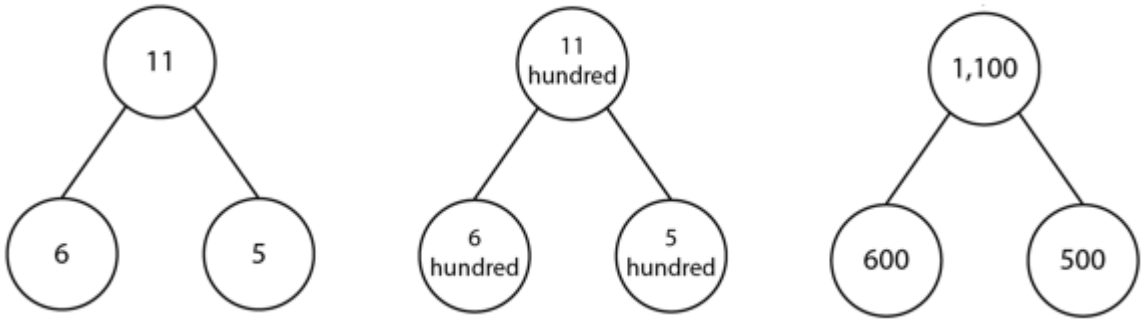
Compare numbers to 10,000 using < > =	
Show on a number line the nearest 10, 100, 1000	
Round any number to the nearest 10/ 100/100 0	Is 37 nearer to **30** or **40**?

	Use a numberline. Mark the next and previous multiple of 10, 100 or 1000. Mark on the middle point. Then round to the nearest multiple **Do not use 4 to the floor, 5 to the sky**

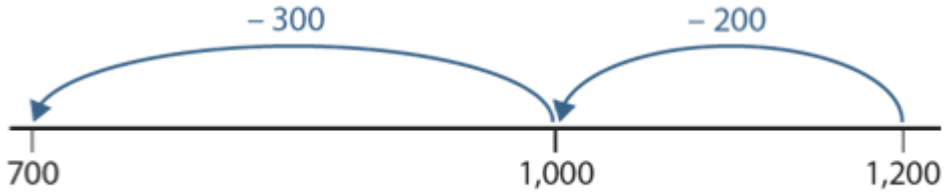
	What is **373** rounded to the nearest multiple of 100?  Is 373 nearer to **300** or **400**?
Be able to show negative numbers on a numberline	

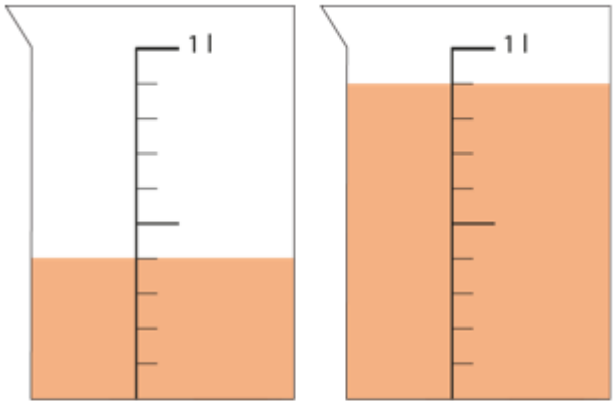
Count forward and back through 0 using negative numbers	  Use everyday contexts such as temperature and water depths.

Autumn 1	Y4 Addition and Subtraction (ENL and mental strategies)
Prior Learning	Children should be able to use ENL strategies for 2 and 3 digit numbers where appropriate by making the next multiple of 10 or 100 overjumping or jumping in 10s and 100s. Some children may also be able to adjust calculations to make them easier. They should know that addition is commutative, and subtraction isn't and they should know how to find the difference by adding on. They should be able to estimate an answer e.g 53 + 48 is around 100. See Dfe Ready to Progress Number Facts and Addition and Subtraction Y2 and 3 to fill gaps
Continuous Provision	Identifying no work, mental and jottings calculations should be part of continuous provision and once children are secure with written methods always provide calculations that don't need a formal method. Empty box calculations, moving the equals sign and balancing equations should also be part of continuous practise and number talk. times tables
Key Vocabulary	Use unitising language such as 5 tens subtract 3 tens equals 2 tens, three hundreds add 4 hundreds equals 7 hundreds. sum, total, difference, total, altogether, how many more, how much less, find the difference, estimate
Key Facts	Number bonds to 1000 e.g., 640 + 360 = 1000 1000 more / less than any number
Skills and Knowledge By the end of the teaching sequence children	Examples and models and images to use

should be able to…	
Add and subtract multiples of 100 and 1000	600 + 500= 1,100  **use the same image but for multiples of 1000** 

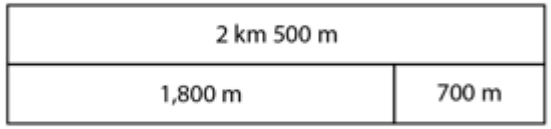
1,200 − 500= 700

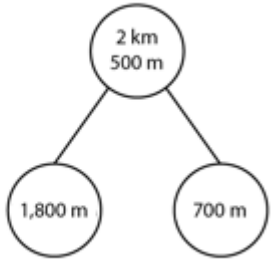




400 ml 900 ml

\+ = 1,300 ml





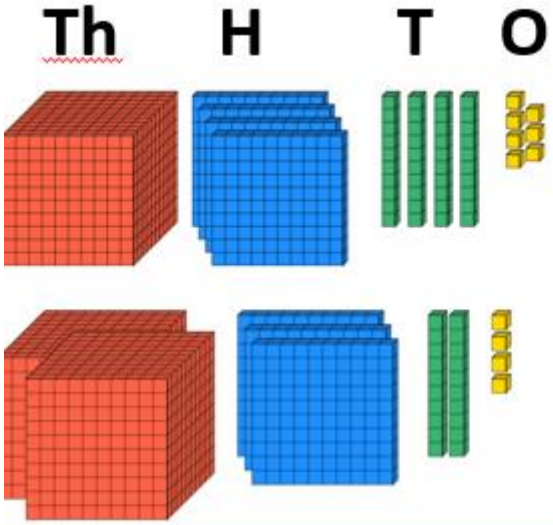
Add/subtract multiples of 1s 10s 100s and 1000s from any number to 10, 000	Use the context of measure to review concepts from Y3 and practise ENL strategies 5000 – 3 5000 -30 5000 – 300 5000 – 3000 3456 + 2 + 20 + 200 +2000 Ask: what's the same, what's different?
Add/subtract 4d numbers using overjumping where appropriate	2459 + 1998 = 5678 – 2996 =
Add/subtract 4d numbers using adjusting where appropriate	2459 + 1998 = 2457 + 2000 (+ 2 to one side and – 2 from the other) 5678 – 2996 = 5682 – 3000 (add the same to both sides)
Solve balancing equations and empty box	

calculations	
Autumn 2	**Y4 Addition and Subtraction (Written methods)**
Skills and Knowledge **By the end of the teaching sequence children should…**	**Examples and models and images to use**
Add 3d numbers using column addition with one exchange	
Add 3d numbers using column	

addition with more than one exchange

Add 4d numbers using column addition with one exchange

Add 4d numbers using column addition with more than one exchange



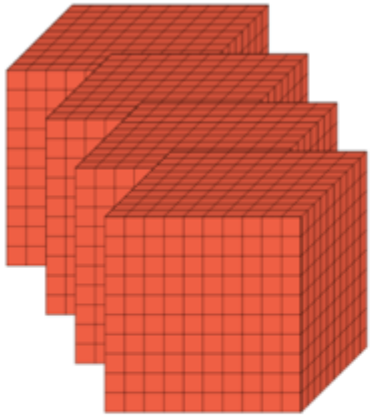
Th	H	T	O
1	4	4	7
+ 1	3	2	4
3	7	7	1
	1		

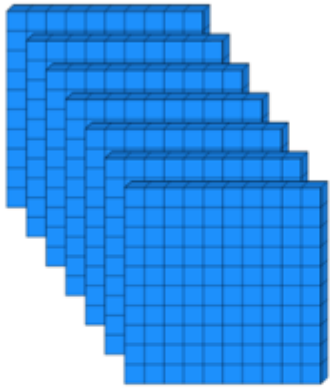
Th	H	T	O
1,000	400	40	7
+ 2,000	300	20	4
3,000	700	70	1
		10	

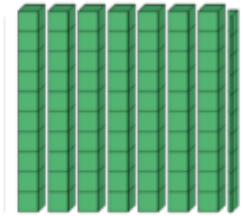
	Note: expanded form is good for exposing the structure but can be confusing if relied upon as a method.	Eleven ones is exchanged for one ten and one one use PV counters once concept is secured.
Subtract 3d numbers using column addition with one exchange		
Subtract 3d numbers using column addition with more		

than one exchange	
Subtract 4d numbers using column addition with one exchange	

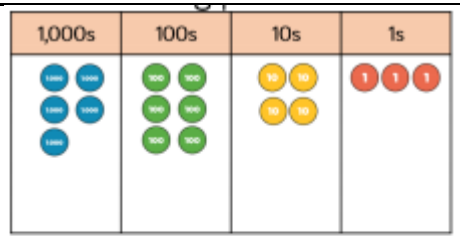
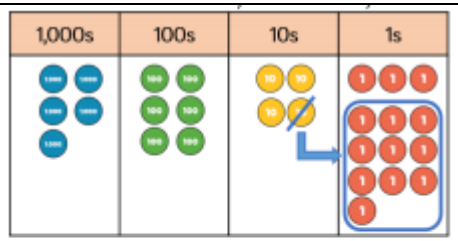
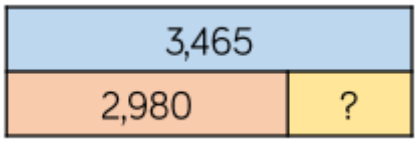
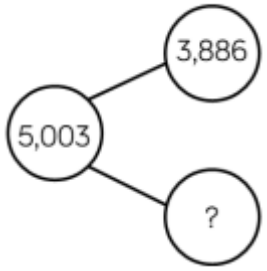
Subtract 4d numbers using column addition with more than one exchange	There is not enough ones to subtract 6 so exchange one ten for ten ones. Ten ones plus 2 ones is 12 ones. 12 ones subtract 6 ones is 6 ones. Now there is 7 tens not 8 tens. 7 tens subtract 3 tens is 4 tens etc. Use PV counters once secure with the concept. Moving to abstract algorithm

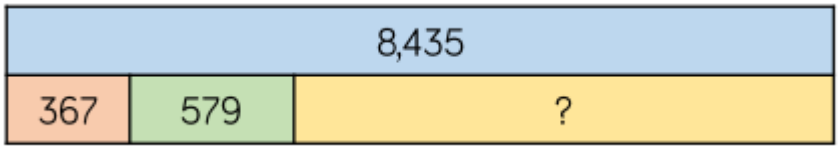






Th	H	T	O
		70	10
4,000	700	~~80~~	2
- 2,000	500	30	6
2,000	200	40	6

	Note: we have found that Base 10 works best with the abstract alongside – PV counters can be too fiddly and Base 10 show the concept clearer.	  Th H T O 5 6 3 4 / 1 3 – 4 3 1 6 1 3 2 7
Use the inverse to check answers and show calculations as part – whole models	Also write 4 calculations that go with the part whole model	 

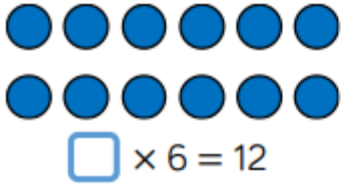
Be able to solve one step and two step problems in different contexts using addition and subtraction and apply the correct calculation method e.g measure and time reviewed from Y3 leading on to Y4 objectives below	A shop has 8,435 magazines. 367 are sold in the morning and 579 are sold in the afternoon. How many magazines are left? 

Autumn 2	Y4 length and perimeter
Prior Learning	Children should be able to measure with a ruler and know cm and metres and how many cm in a m
Continuous Provision	Calculations should be a mix of ones which need a written method and ones which could be done mentally or with jottings – procedural variation and intelligent practise built in. Times tables
Key Vocabulary	millimetre centimetres metres kilometres
Key Facts	1cm = 10 mm 100cm = 1m 1000m = 1km
Skills and Knowledge By the end of the teaching sequence children should…	Examples and models and images to use

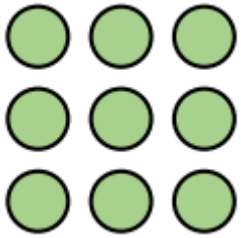
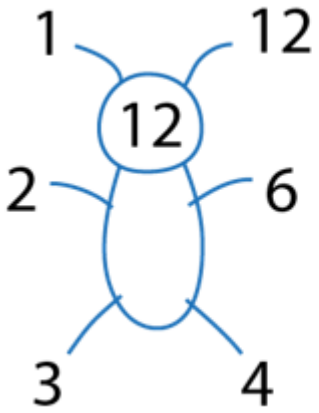
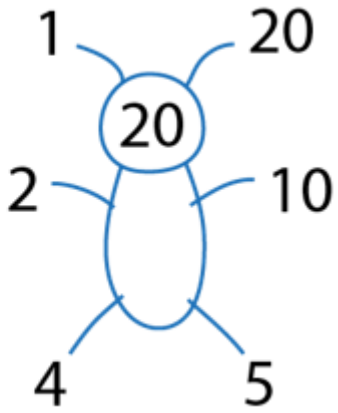
Know how many metres in a km	Use bar model to review number bonds to 1000
Convert between metres and kilometres	
Add and subtract lengths	Review addition and subtraction strategies and fractions of amount in ½ km etc
Understand that perimeter means the outside of a 2D shape	
Find the perimeter of rectilinear shapes	

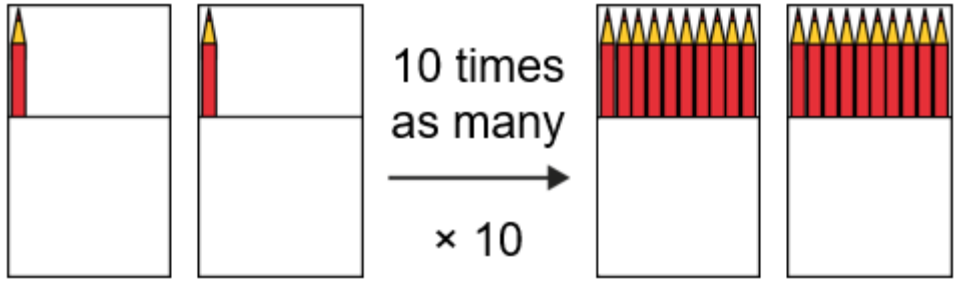
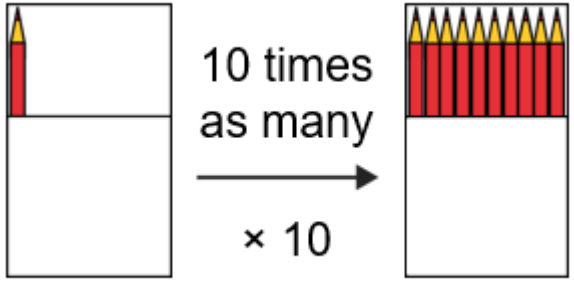
Spring 1	Y4 Multiplication and Division
Prior learning	Know all the of the multiplication and division facts for 2s 5s 10s 3s 4s 8s Understand the concept of multiplying by 1 and by 0 Understand the concept of dividing by 1 and itself Use fact triangles to make multiplication and division fact families and extended fact families Understand multiplication as repeated addition Understand multiplication and division as an array Understand division as grouping and sharing Use the distributive law to make calculations easier 7 x 8 can be 5 x 8 + 2 x 8 (use arrays)NCETM 2.10 Understand that multiplication is commutative, but division isn't See DfE Ready to Progress for Y3 for interventions
Continuous Provision	Times tables facts plus addition and subtraction strategies time measure money (previous year group) Remember to put in for Multiplication Test and start setting up practises for groups.
Key Vocabulary	Use group size and number of groups 3 , 4 times Use the language of dividend ÷ divisor = quotient factor x factor = product Understand and use the word multiple Understand and use multiply, divide, groups of, lots of, grouping and sharing (quotitive and partitive division) Use unitising language 30 x 4 3 tens, 4 times
Key facts	Use the distributive law to make calculations easier 7 x 8 can be 5 x 8 + 2 x 8 (use arrays)NCETM 2.10 Make links with doubling and halving through links with 4 x and 8x and 3x and 6x plus doubling and halving factors) Be able to discuss which methods are efficient and error proof or error prone. Be able to multiply 3 numbers Be able to x 10/100 and a multiple of 10/100 Use the area model and formal written algorithm of short division Use multiplication in the context of scaling (3 times as many, 10 times bigger problems)

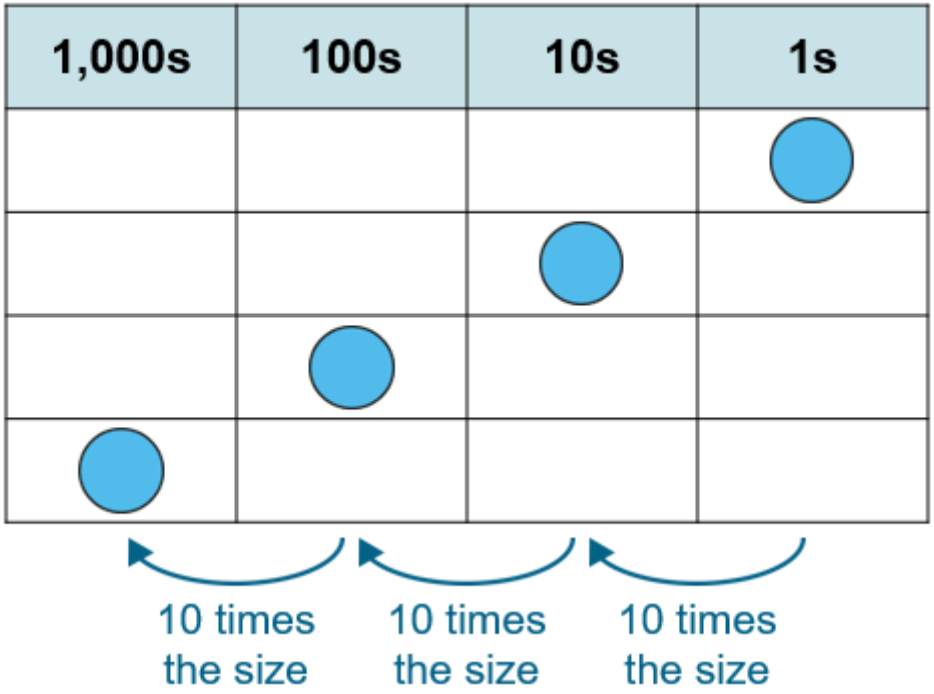
Skills and Knowledge By the end of the teaching sequence children should…	**Examples and models and images to use**
Know all tables to 12 x 12	Children should be secure on multiplication tables from Y2 and Y3 already through continuous provision and a separate practise. Children will know all times tables by the end of the Spring Term. Use NCETM 2.8, 2.9. and 2.11 for times tables as well applicable White Rose sections and cover the key concepts above.

Find factor pairs of a number and understand that factor pairs are commutative. Teach children to be systematic and start with one.	Make arrays using counters to find factors of the same product. Use x table square to make arrays $1 \times \square = 12$  $\square \times 6 = 12$ $\square \times \square = 12$

×	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

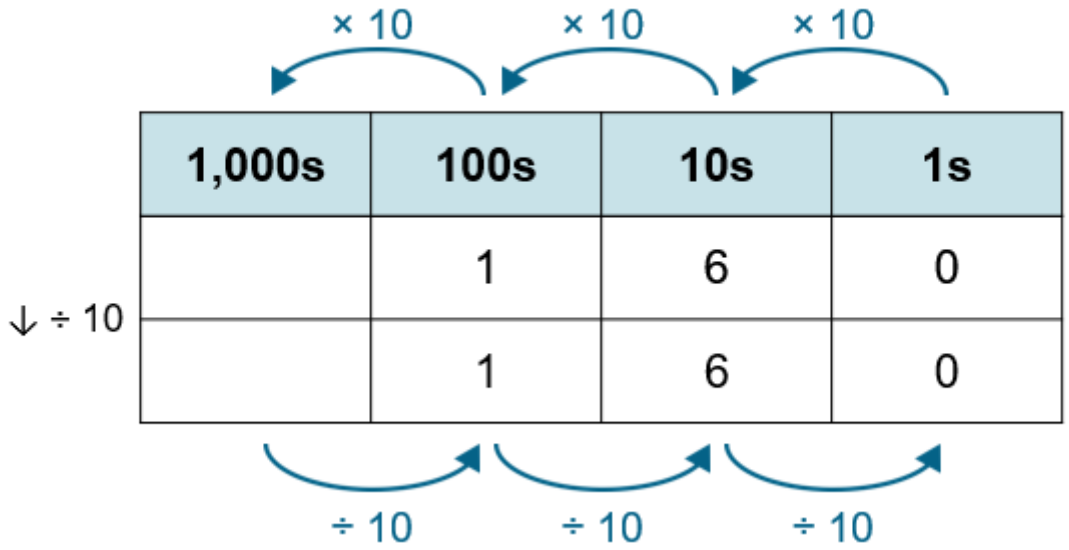
	Possibility of teaching square numbers here (although Y5 objective) whilst making arrays for factor pairs.   
Use the associative law to make multiplying 3 digits easier	2 x 16 x 5 can be 2 x 5 x 16 = 10 x 16 = 160

Multiply and divide by 10 and 100 NCETM 2.13	Also use dienes here.   See Ncetm 2.13



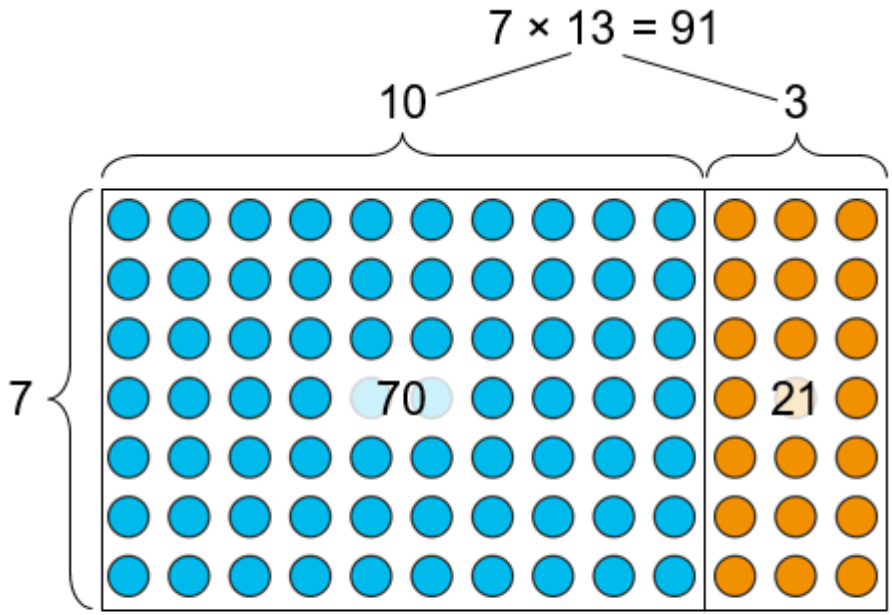
1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9

× 10 ÷ 10

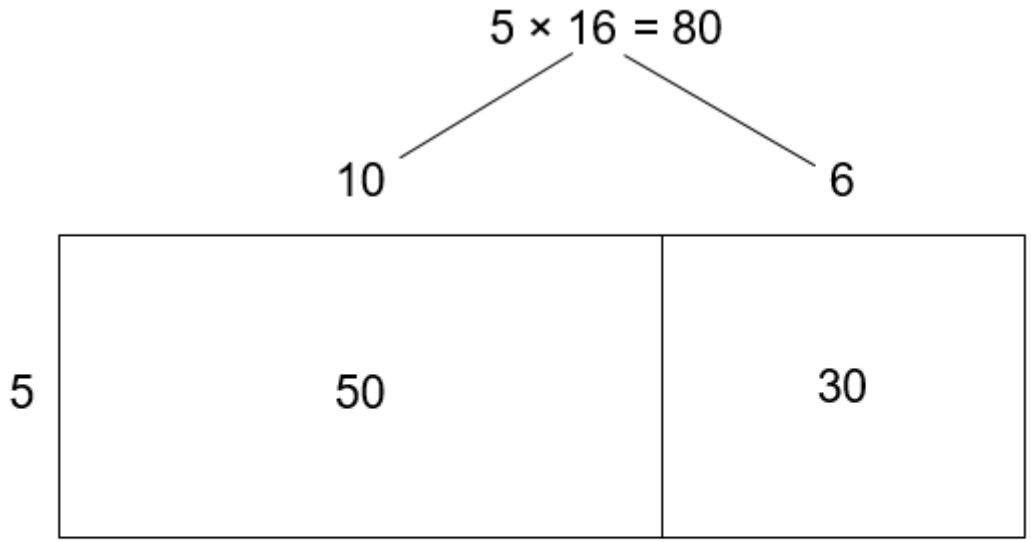
	Also use dienes here with the PV chart before using PV counters and digits. Links can be made with measure and money here. 
Know that when you x by 100 you x by 10 and	

10 again and vice versa for division	
Know that x 5 is the same as x 10 then dividing by 2	
Know that ÷ 5 is the same as ÷ 10 then x by 2	
Use place value and known facts to multiply and divide and create extended fact families using known facts	120 ÷6 30 x 40 = 1200 6 x 4 = 240 60 x 4 = 240 60 x 40 = 2400 ¼ of 24 = 6 ¼ of 240 = 60
Count in multiples of 10 , 25 and 50	

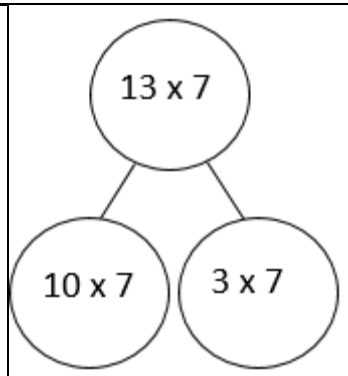
Multiply 2 d by 1d using the area model (reviewed from Y3)	Cuisenaire rods can also be used see Y3.



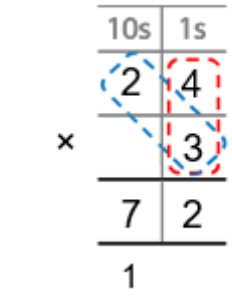
$$7 \times 13 = 7 \times 10 + 7 \times 3$$
$$= \quad 70 \quad + \quad 21$$
$$= 91$$

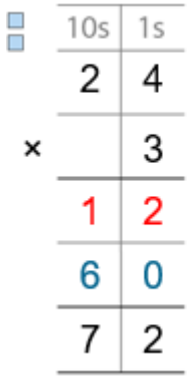


$$5 \times 16 = 5 \times 10 + 5 \times 6$$
$$= 50 + 30$$
$$= 80$$


13 x 7
10 x 7
3 x 7

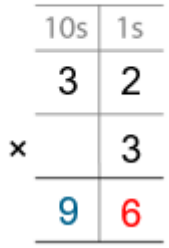
Multiply 2 d by 1d using short multiplication algorithm (use the area model and algorithm alongside)



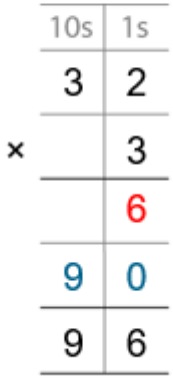


4 ones x 3 = 12 ones
= 1 ten + 2 ones
2 tens x 3 = 6 tens

3 × 32 = 96

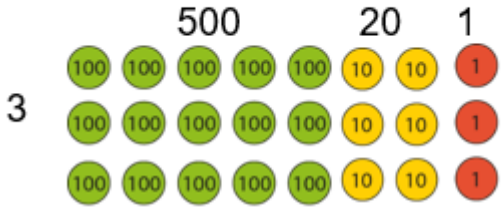
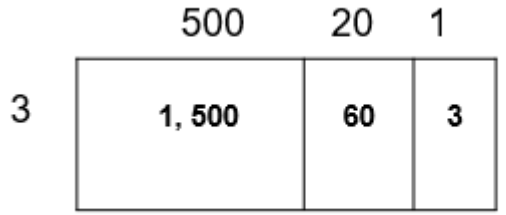


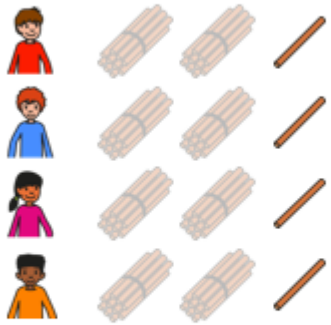
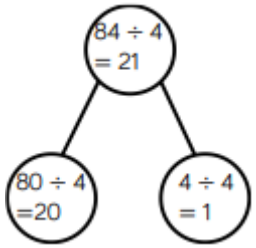
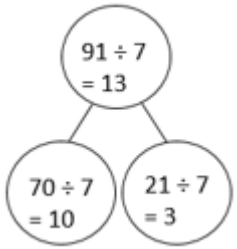
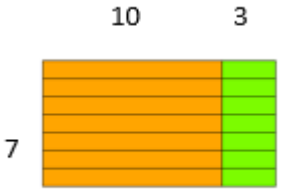
3 × 32 = 96

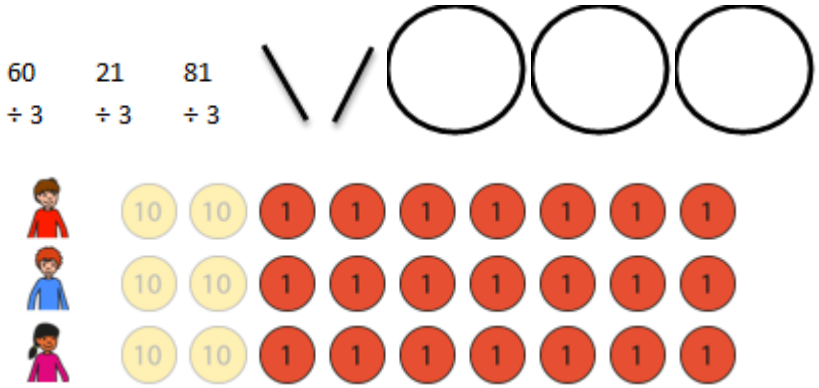


2 ones x 3 = 6 ones
3 tens × 3 = 9 tens

Expanded with area model alongside then abstract algorithm with area model alongside. Using language of unitising.

Multiply 3 d by 1d using the area model (possibly use formal method here as well – see Y5)	521 × 3 = 1,563  521 × 3 = 500 × 3 + 20 × 3 + 1 × 3 = 1,500 + 60 + 3 = 1,000 + 500 + 60 + 3 = 1,563  521 × 3 = 500 × 3 + 20 × 3 + 1 × 3 = 1,500 + 60 + 3 = 1,000 + 500 + 60 + 3 = 1,563
Solve correspondence problems using multiplication facts	
Divide numbers using known facts and place value e.g using	640 ÷ 8 = 80 6400 ÷ 8 = 800 1/8 of 640 Division is always more difficult than multiplication so spend more time on it. Also link to fractions of an amount wherever possible.

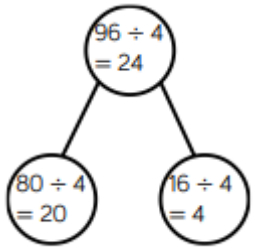
fact families	
Divide 2d by 1d using concrete apparatus and sharing. See NCETM 2.15 up to slide 41 for animations	84 ÷ 4 = 21  Different strategies should also be discussed. E.g. this could be solved by halving and halving again. 8 tens ÷ 4 = 2 tens 4 ones ÷ 4 = 1 one 84 ÷ 4 = 21  By using dienes and PV exchanging the tens for ones, children will learn to partition the dividend sensibly which in turn will help them move on to the mental/jotting strategy below.  

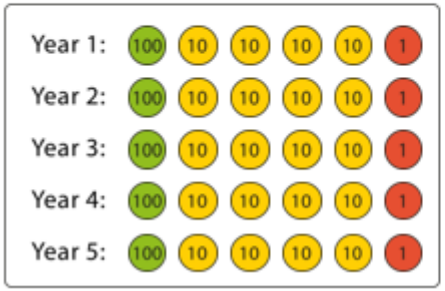
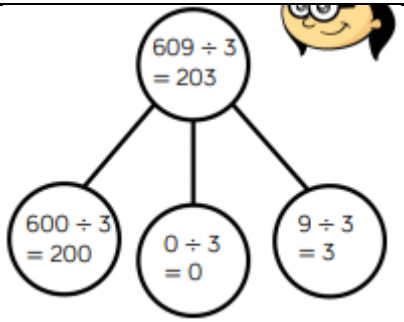


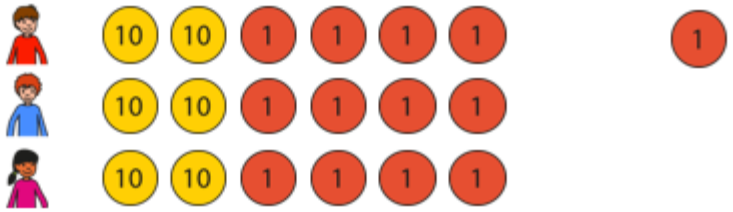
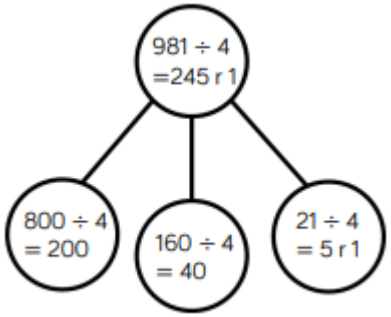
6 tens	÷	3	=	2 tens
21 ones	÷	3	=	7 ones
81	÷	3	=	27

Divide 2d by 1d using partitioning

For many children once they have mastered the concept with the concrete apparatus (above) they can use this strategy as a mental/jotting strategy.



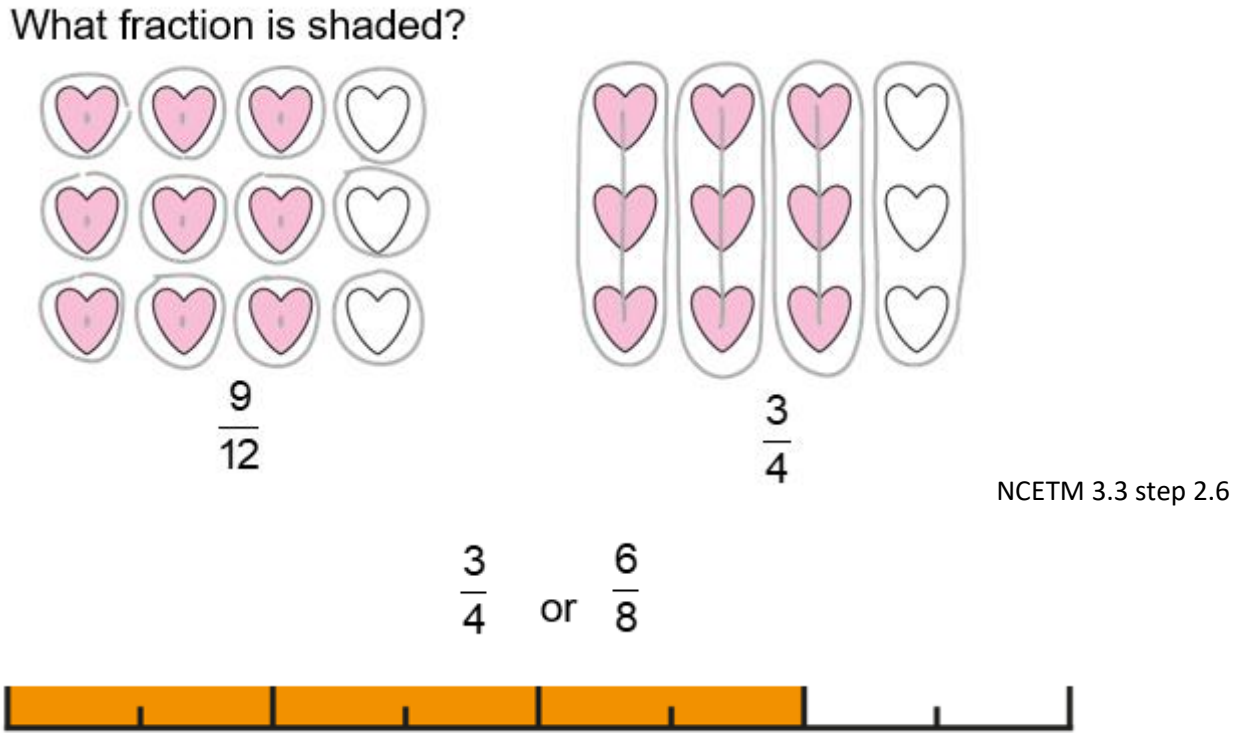
Divide 3d by 1d using concrete apparatus and sharing	705 ÷ 5 = 141 Dienes should be used before PV counters. Show exchanging of tens to ones. This model shows the groups of which leads on to short division in Y5.  7 hundreds ÷ 5 = 1 hundred r 2 hundreds 2 hundreds = 20 tens 20 tens ÷ 5 = 4 tens 5 ones ÷ 5 = 1 one
Divide 3d by 1d using partitioning	This should be used as an efficient mental/jotting strategy and a lead on to formal methods in Y5. If calculations are too complex then this method becomes inefficient and short division would be a more efficient method. 

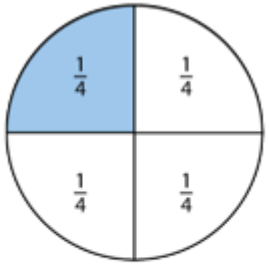
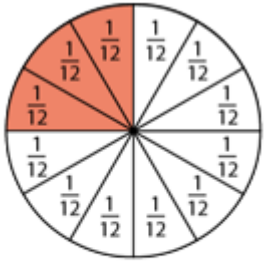
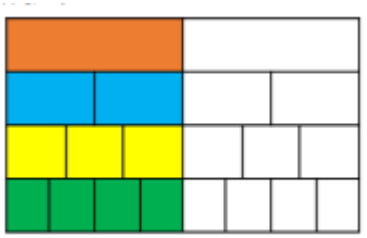
Divide with remainders see NCETM 2.12 and Y3 for a revision of this concept.	73 ÷ 3 = 24 r 1  6 tens ÷ 3 = 2 tens 13 ones ÷ 3 = 4 ones r 1 one 73 ÷ 3 = 24 r 1 
Spring 1	**Y4 Area**
Prior learning	**2D shapes Times tables able to count squares** **This is new learning although some children may have come across it and be familiar with the term 'area'**

Continuous Provision	**Times tables 2D shape revision review of cm m mm and lengths and perimeter**
Key Vocabulary	**Area perimeter side height length width**
Key Facts	**How to find area and perimeter**
Skills and Knowledge **By the end of the teaching sequence children should…**	
Understand what area is	Review perimeter here
Find an area of a rectilinear shape by counting squares	

Find an area of a rectilinear shape by multiplying the sides	
Spring 2	**Y4 Fractions**
Prior learning	**Before starting Y4 objectives review the key concepts from Y3. It is very important that all fraction work is done with concrete apparatus as well as diagrams and images.** **Understand unit and non-unit fractions and can represent them as diagrams, shapes, quantities and on a number line** **Understand the concept of equal parts and the whole** **Understand the language of numerator and denominator** **That is the numerator and denominator are the same this makes the whole** **That ½ means 1 whole divided by 2 ¼ is a whole divided by 4 etc.** **See DfE Ready to Progress and NCETM for Y3 for intervention/gap fill**
Continuous Provision	**Times tables and links with times tables and fractions addition and subtraction strategies rounding**
Key Vocabulary	**Unit fraction non-unit fraction numerator denominator equal whole part** **Check that children can say, write and spell fractions correctly especially quarters**
Key Facts	**When comparing unit fractions the greater the denominator the smaller the fraction** **When comparing non-unit fractions with the same denominator the greater the numerator the greater the fraction.** **Know that fractions can be equivalent and be able to show this with a diagram/manipulatives**

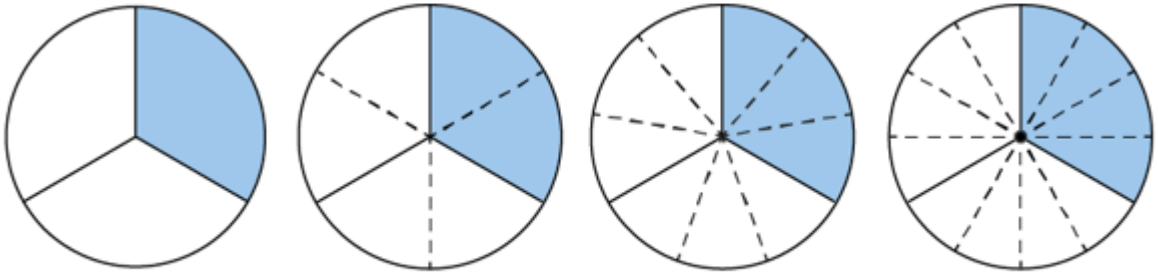
	Apply the knowledge of tenths and hundredths to money and measure **Vocabulary of improper fraction and mixed fraction**
Skills and Knowledge **By the end of the teaching sequence children should…**	**Examples and models and images to use**

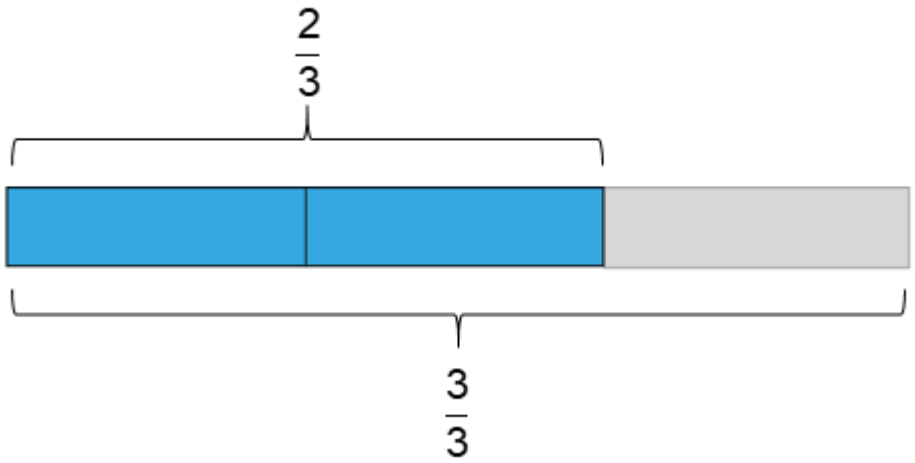
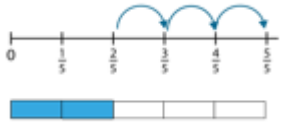
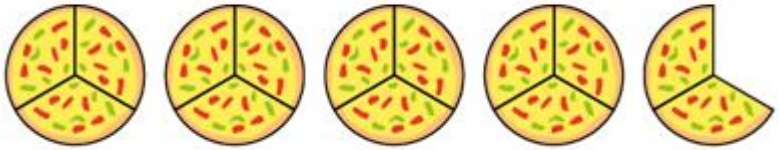
Represent equivalent fractions as images	

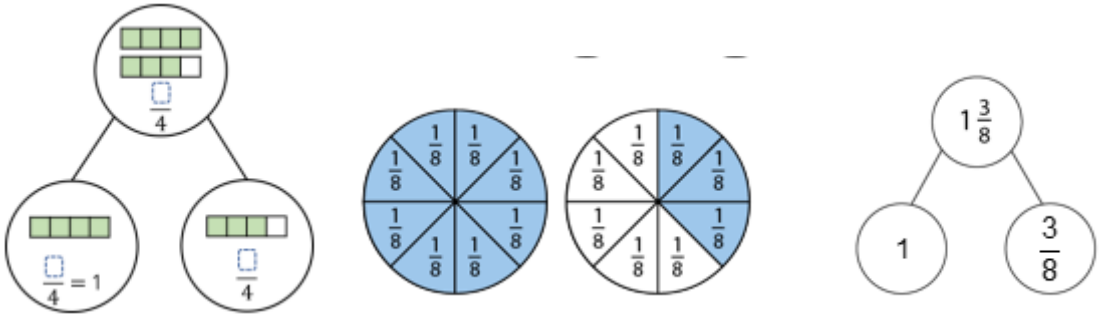
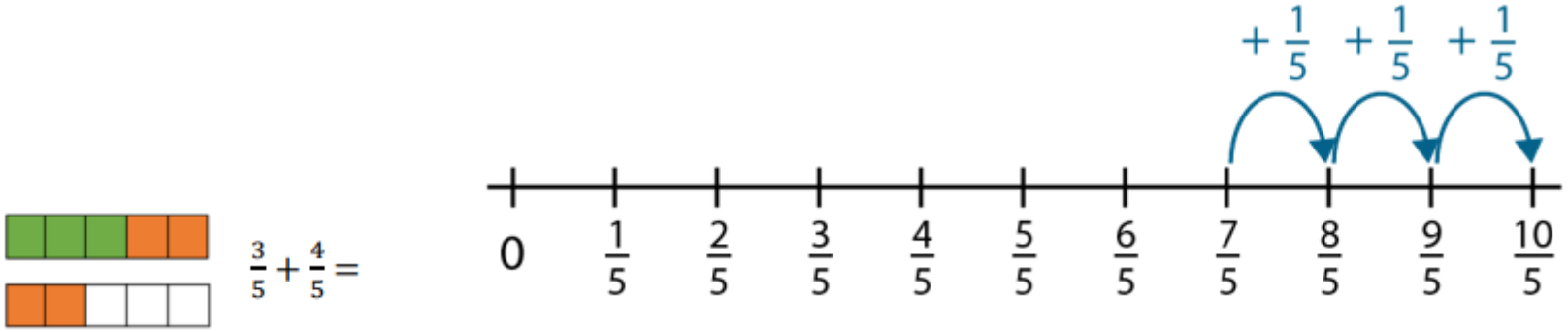
Find equivalent fractions making links with times tables (from Y3 objectives and Y4)	  $\frac{1}{4}$ $\frac{3}{12}$ Use strips of paper and make own fraction wall then move to drawing and splitting up diagrams. 

	Draw attention to the multiplicative relationship between the fractions and the numerator and denominator. Children can then create their own from diagrams. Creating equivalent fractions in an abstract way will be in Y5

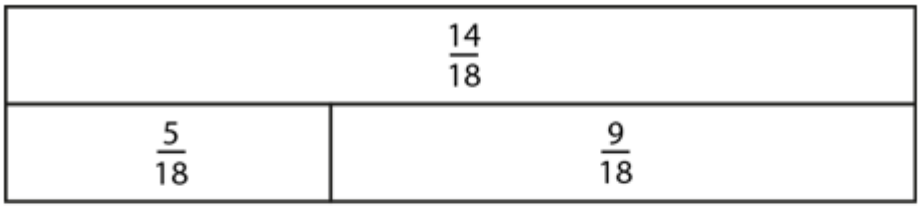
$\frac{1}{3}$ $\frac{1}{3} = \frac{\ }{\ }$ $\frac{1}{3} = \frac{\ }{\ }$ $\frac{1}{3} = \frac{\ }{\ }$

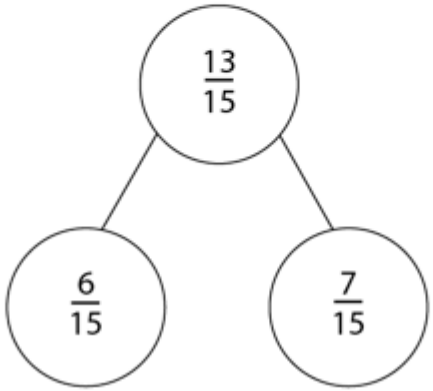


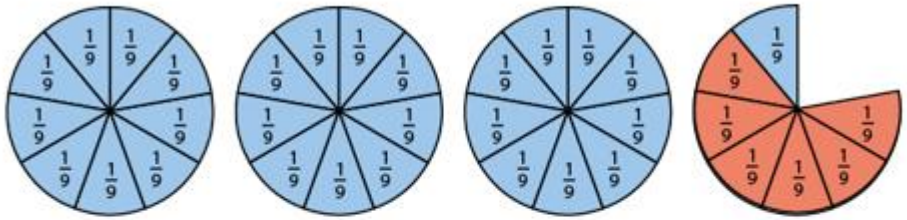
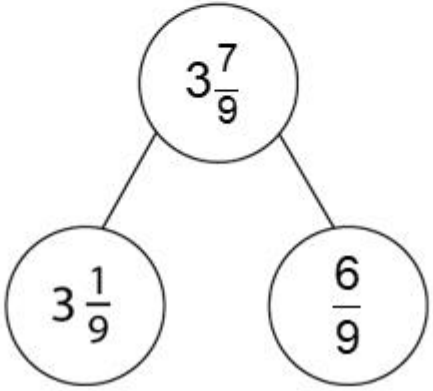
Know what fraction is needed to complete the whole	 
Count in fractions on a number line beyond a whole NCETM 3.5	
Show fractions of more than one as an image NCETM 3.5	

Understand the concept of improper fractions and mixed fractions and be able to represent a fraction both ways alongside an image	
Add 2 or more fractions with the same denominator and show understanding with images	

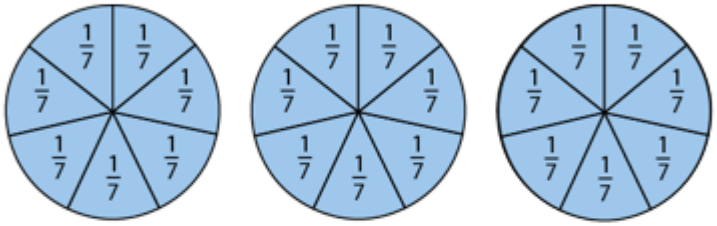
As in addition and subtraction for whole numbers use the part whole models and write the 4 equations.

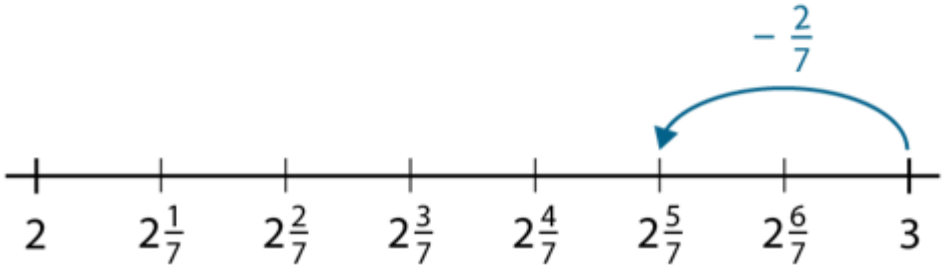


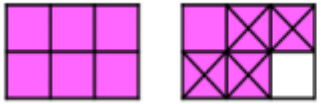


Subtract 2 fractions with the same denominator and show understanding with images	$3\frac{7}{9} - \boxed{\frac{6}{9}} = 3\frac{1}{9}$  

$$3 - \frac{2}{7} = 2\frac{5}{7}$$

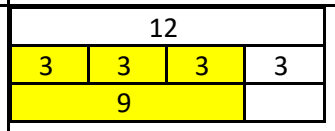


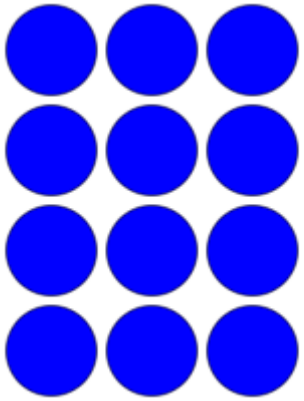
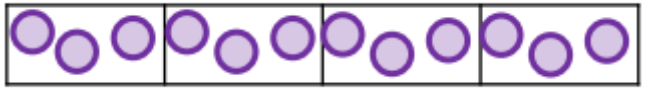
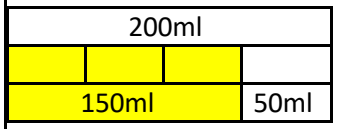




$\frac{11}{6} - \frac{\square}{6} = \frac{\square}{6}$

Find non-unit fractions of quantity review from Y3 and

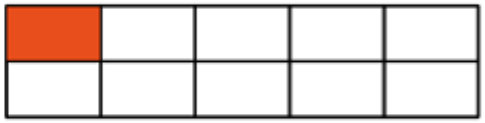


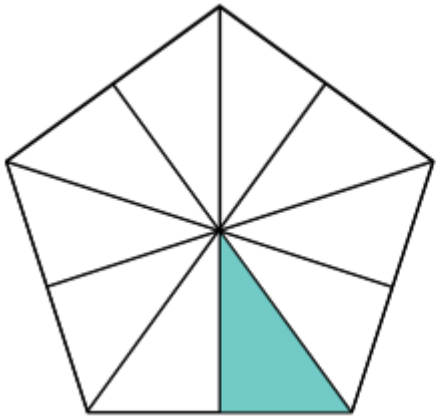
extend to larger numbers	 
Find the whole from the fraction of quantity	Use the bar model to find whole amount from the fraction of the amount. If ¾ is 150ml how much is in the whole bottle 
Know key fraction of amount facts such as ¼ of 100 is 25 ¾ of 100 is 75 –	

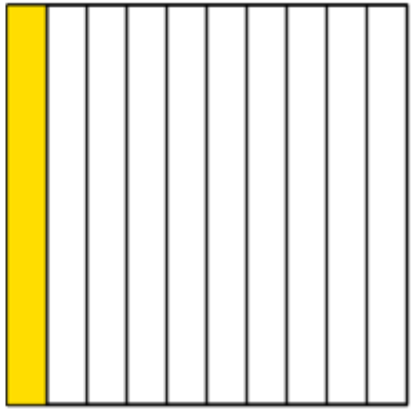
this will help wit decimal equivalents later on.	

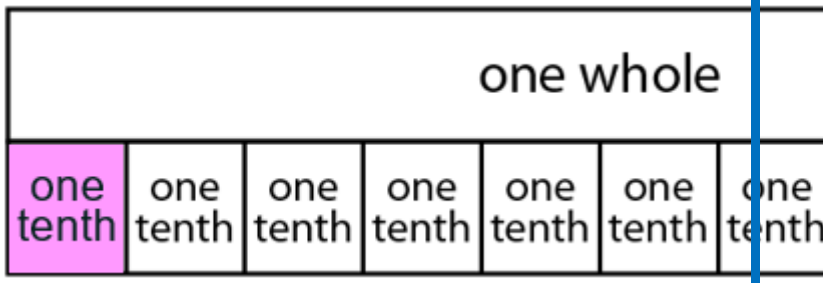
Summer 1	Y4 Decimals and Money
Prior Learning	Concept of tenths is moved from Y3 to Y4 to fit with hundredths and money. Children should already however to familiar with money and ca be needed and use concrete apparatus where possible to secure the concept. Children should be competent with ENL strategies for addition and subtraction
Continuous Provision	Times tables (now is the time that you should start doing the government practise tests) addition and subtraction strategies and rounding
Key Vocabulary	Ones Tenth hundredth decimal pounds pence
Key Facts	There are ten tenths in one whole ten hundredths in one tenth 100 hundredths in one whole Place tenths and hundredths on a numberline Fraction and decimal equivalents tenths e.g 1/10 = 0.1 5/10 = 0.5 = ½ ¼ = 0.25 - link with counting in multiples of 10, 50 and 2
Skills and Knowledge By the end of the teaching sequence children should…	Examples and models and images to use

One tenth is a whole divided by 10



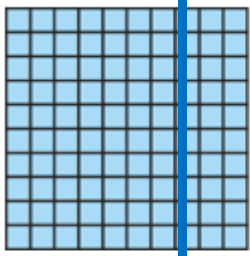






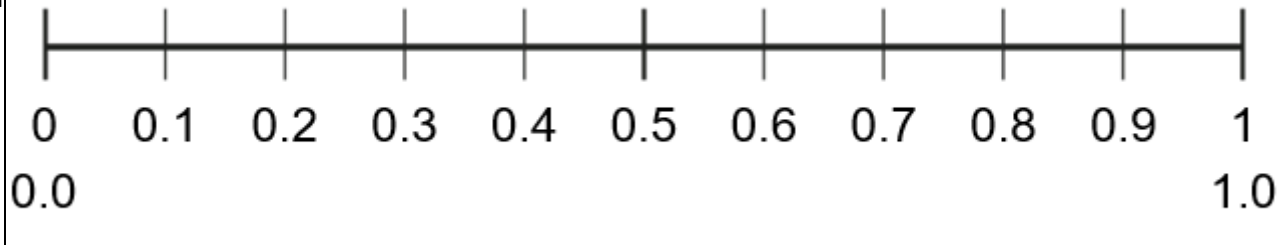
Write tenths as fractions , decimals, words and images

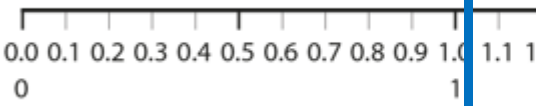
Image	Words	Fraction	Decimal
	five tenths		
			0.9



Base 10 one hundred block as one whole

Show tenths on a number line (as fractions and decimals) and count in tenths





Show tenths on a PV chart

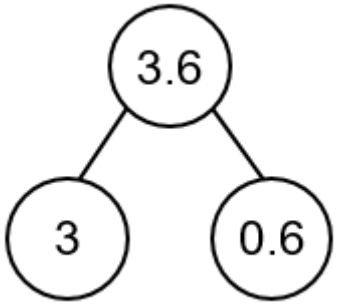
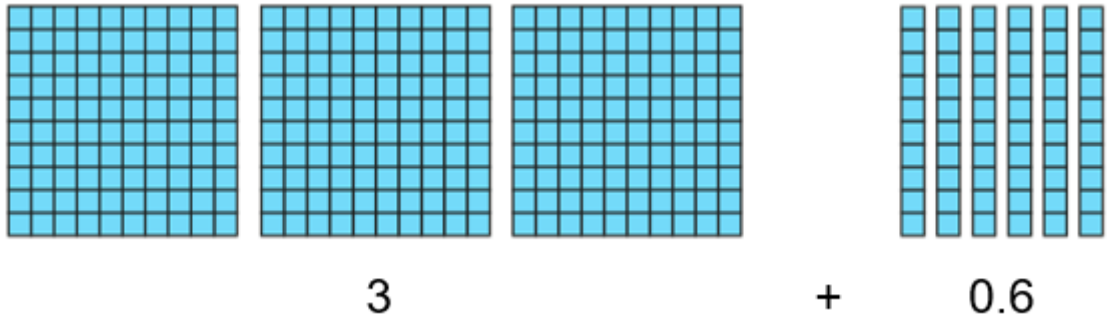
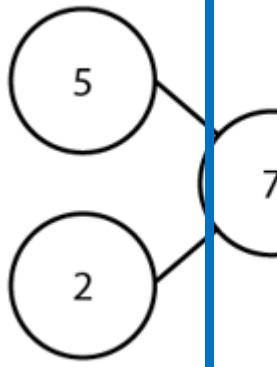
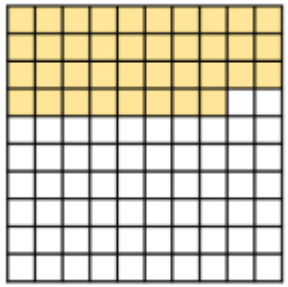
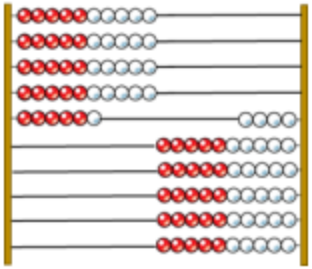
1,000s	100s	10s	1s	tenths
1	0	0	0 .	0
	1	0	0 .	0
		1	0 .	0
			1 .	0
			0 .	1

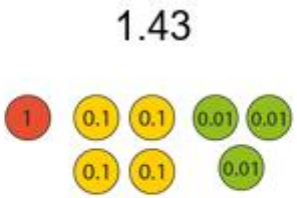
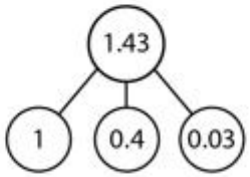
1,000s	100s	1
1		
	1	

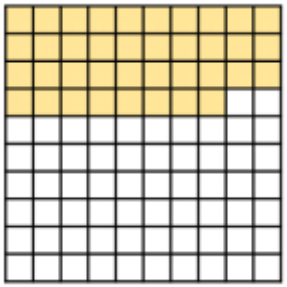
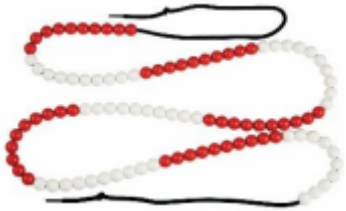
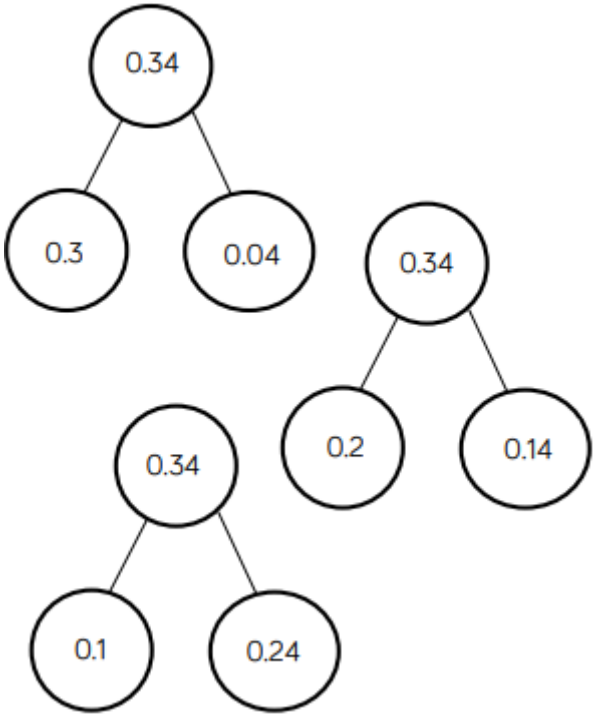
ten times smaller → one tenth the size

ten times smaller → one tenth the size

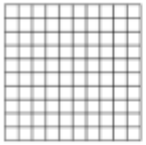
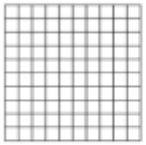
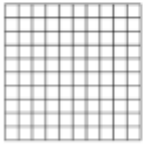
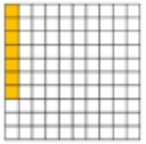
	100	200	300	400	500	600	700	800	900
	10	20	30	40	50	60	70	80	90
	1	2	3	4	5	6	7	8	9
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9

Partition tenths	  
One hundredth is a whole divided by 100 Understand 10 hundredths is one tenth and you get hundredths by dividing tenths by 10	Show links with whole numbers – you could also use a tens frame here. Use unitising language - 36 tenths  

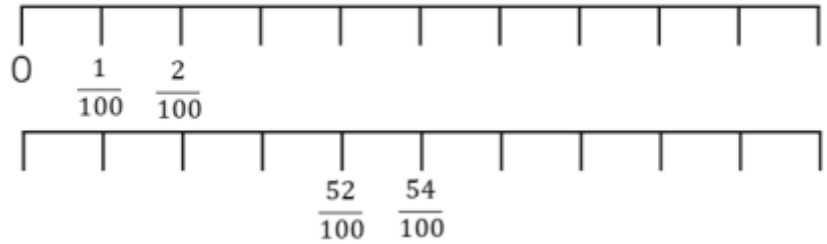
Partition numbers into tenths and hundredths	**65/100 = 6 tenths and 5 hundredths or 6/10 and 5/100**   1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000 9,000 100 200 300 400 500 600 700 800 900 10 20 30 40 50 60 70 80 90 1 2 3 4 5 6 7 8 9 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09

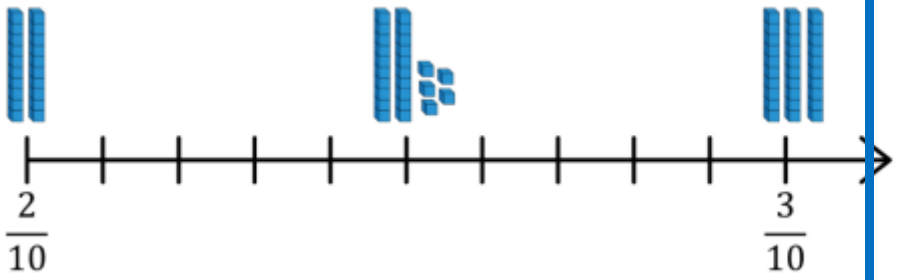
Partition decimals in a variety of ways	Use dienes and a bead string/bar to play around with this concept   

Write hundredths as fractions , decimals, words and images

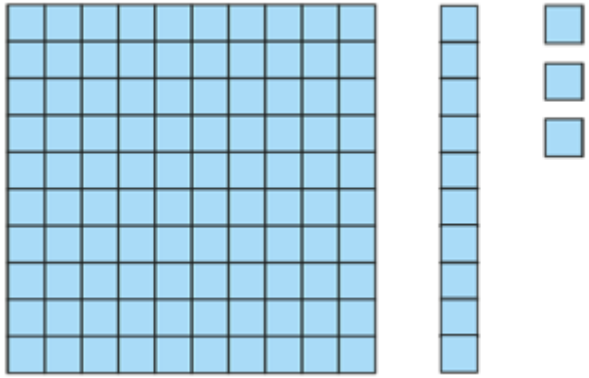
Image	Words	Fraction	Decimals
	56 hundredths		
		$\frac{17}{100}$	
			0.2
			

Show hundredths on a number line (as fractions and decimals) and count hundredths

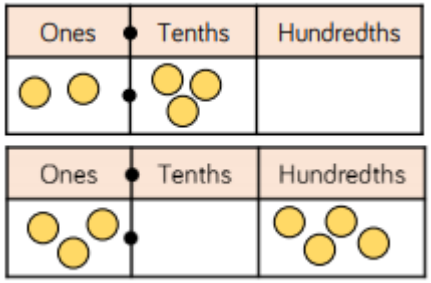




Show hundredths on a PV chart



Use dienes first then can use PV counters or normal counters



Use unitising language 1.2 can be 12 tenths 1.13 can be 113 hundredths 0.23 can be 23 hundredths

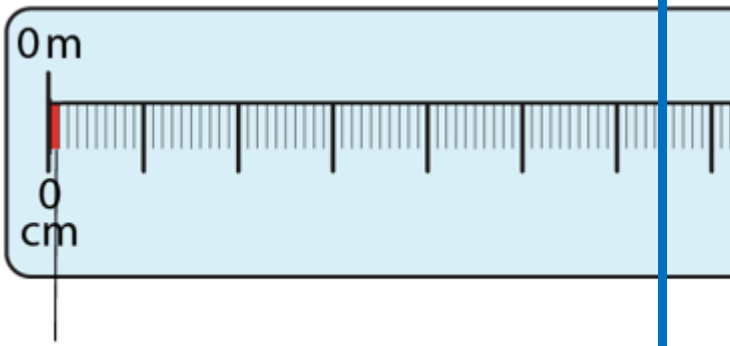
Explain what happens when you divide a 1 or 2d number by 10

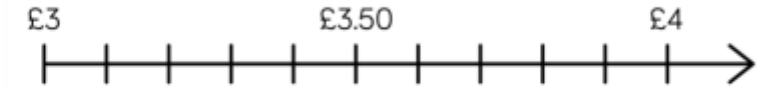
Explain what happens when you divide a 1 or 2d number by 100

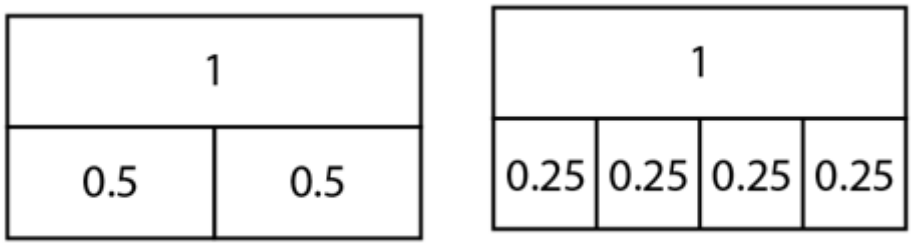
1,000s	100s	10s	1s	tenths	hundredths
1	0	0	0	0	
	1	0	0	0	0
		1	0	0	0
			1	0	0
			0	1	0
			0	0	1

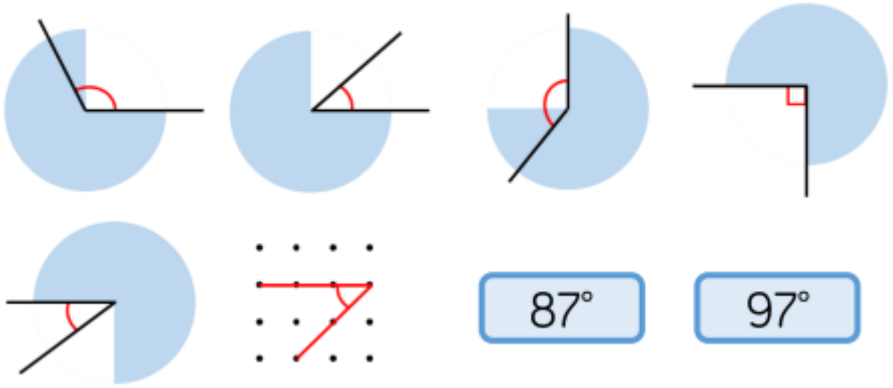
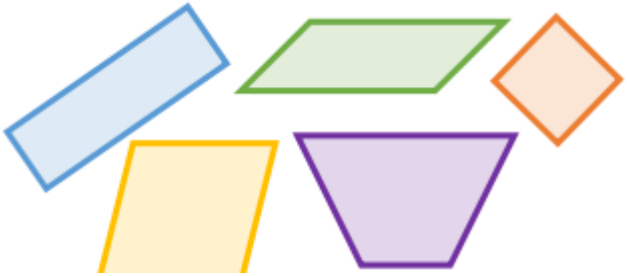
1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09

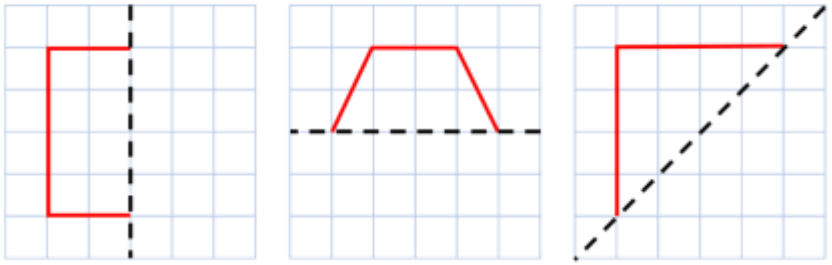
Use a PV chart with dienes and gattengno chart. Children should be familiar with this from the spring term and multiplying and dividing whole numbers by 10 and 100

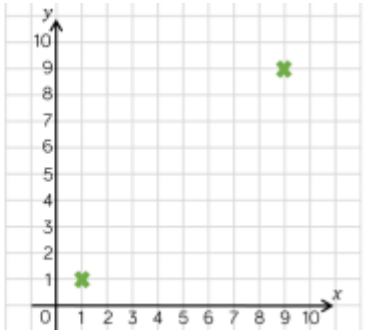
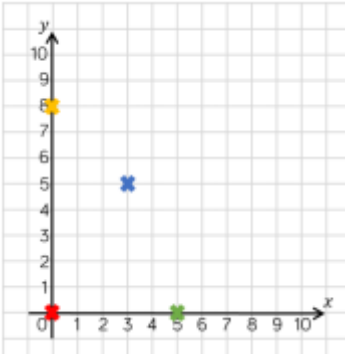
Compare and order decimals to 2dp by understanding the number of tenths and hundredths in a number	**Do in all contexts including measure and money.**
Understand tenths and hundredths in the context of measures.	 3 m 46 cm = 3.46 m  one hundredth of a metre
Understand hundredths and tenths in the context of money	**Put pounds and pence in a PV grid**

Covert pence into pounds and pence	Use real money where can. How much money is in each purse? There is ____ pence. There is ____ pounds. There is £____ and ____ p There is £___.____ There is ____ pence. There is ____ pounds. There is £____ and ____ p There is £___.____ **Moving on from Y3 money can now be written as decimals**
Compare and order amounts of money	**Use real money and contexts**
Round money to the nearest pound	Place the amounts on the number line and round to the nearest pound. • £3.67 • £3.21 • £3.87  • £7.54 • £7.45 • 701 p
Round decimals to the nearest whole number	**Use the same strategy as above with the number line – just take away the pound symbol**

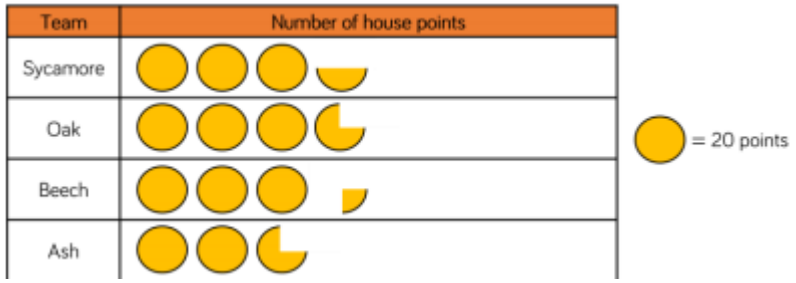
Review fractions by finding ½ a pound ¼ of a pound. Use this to introduce decimal equivalents to ½, ¼ and ¾	
Summer 2	**Y4 Geometry - Shape and position**
Prior Learning	**Children learnt in Y3 2D and 3D shapes different angles including right angles and different lines including horizontal, vertical, perpendicula as review lessons or interventions depending on the number children who have gaps. There are not a lot of Y4 objectives on shape therefore it would a good idea to review from Y3 so that children have a firm grounding going t**
Continuous Provision	**Names of 2D and 3D shapes as a review from last year times tables before MTC arithmetic strategies for Y4 and anything children need to se Review area and perimeter**
Key Vocabulary	**2D 3D horizontal, vertical, parallel and perpendicular right angle obtuse angle acute angle net names of 2D and 3D shapes quadrilaterals is**
Key Facts	**Quadrilaterals have 4 sides and 4 angles with a sum of 360 degrees triangles have 3 sides 3 angles with the sum of 180 degrees Use the x axis first then the Y when using co-ordinates the properties of acute obtuse and right angles**
Skills and Knowledge **By the end of the teaching sequence**	**Examples and models and images to use**

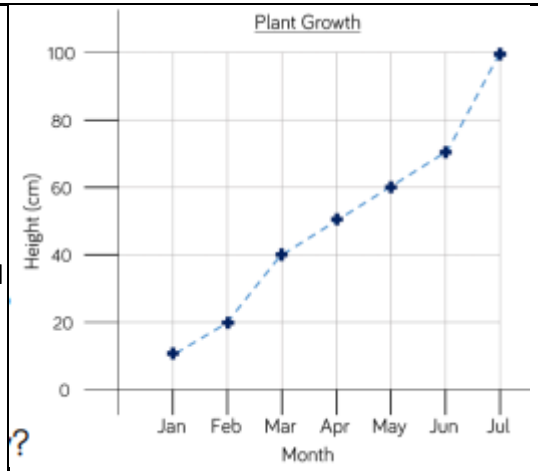
children should…	
Identify, order and compare angles	Sort the angles into acute, obtuse and right angles. 
Identify and draw quadrilaterals	 trapezium square rhombus rectangle parallelogram

Identify and draw triangles	Draw two more sides to create: • An equilateral triangle • A scalene triangle • An isosceles triangle
Identify and draw lines of symmetry in 2D shapes	Using folding, find the lines of symmetry in these shapes. Use shapes cut up in bits of paper to fold Complete the shapes according to the line of symmetry. 
Classify 2D shapes	

Classify 3D shapes	
Identify 3D shapes from nets	
Understand co-ordinates in the first quadrant Plot 2D shapes in the first quadrant Plot points in the first quadrant to complete a 2D shape	Plot two more points to create a square.  Write the coordinates for the points shown. (__ , __) (__ , __) (__ , __) (__ , __) 
Summer 2	**Y4 Time**
Prior Learning	**The children 'should' have all the Y3 objectives and if they do they can tell the time and solve time problems. These Y3 objectives can also be certain elements of Y3 need to be retaught or time needs to taught earlier in the year to fill gaps. Please use Y3 progression map and White**
Continuous Provision	**Gap filling and making sure children are secure on arithmetic skills going into Y5**
Key Vocabulary	**Clock analogue digital hour minute second quarter to/past half past 24hours**
Key Facts	**24 hours in a day 48 hours in 2 days 72 hours in 3 days** **60 minutes in an hour 60 seconds in a minute 120 minutes 2 hours** **12 months in a year 24 months in 2 years 36 months in 3 years** **Use 60 minutes in an hour to calculate accurately**

Skills and Knowledge **By the end of the teaching sequence children should…**	
Convert time from 12hr clock to 24 hr clock	
Convert hours, minutes, days, weeks, months, years	
Read times from time tables	
Solve multi step problems involving time	
Summer 2	**Y4 Statistics**
Prior Learning	**Children should be familiar with tally charts and pictograms Make sure there are varied images and plenty of 'traps' As with time, child en sh progression map and check children have these skills before progressing on to line graphs.**
Continuous Provision	**Gap filling and checking all children are secure on arithmetic skills going into Y5**

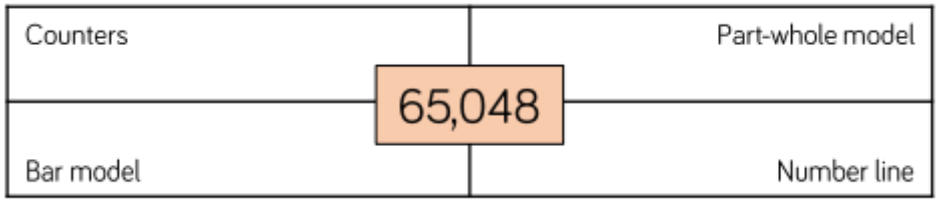
Key Vocabulary	**Key axis bar tally title line graph temperature**
Key Facts	**Chilldren should be able to read, interpret and draw pictograms bar charts and line graphs. They should be taught to look at the key first and assumputions.**
Skills and Knowledge **By the end of the teaching sequence children should…**	
Understand that discrete data can be represented as a bar chart or pictogram	
Solve comparison, sum and difference problems from bar charts or pictograms	

Understand that continuous data such as time, temperature and height can be represented as a line graph	
Read and interpret pictograms, bar charts and line graphs	
Create own bar charts and line graphs from given data	

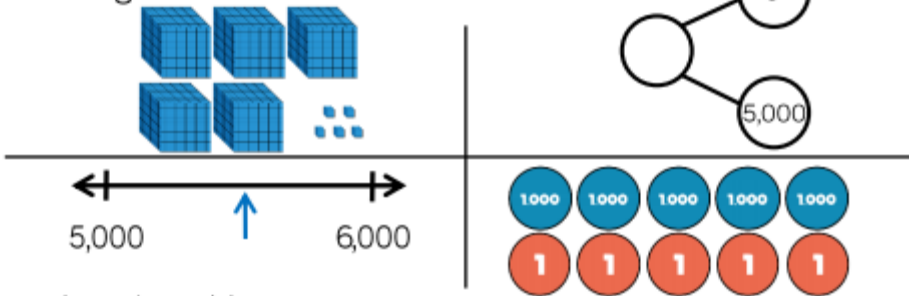
Year 5 Progression

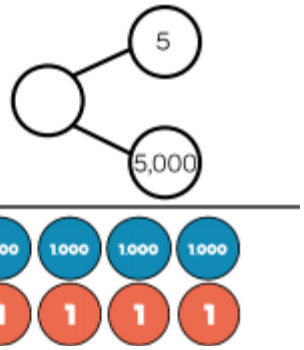
Autumn 1	**Y5 Place Value**
Prior learning	**Roman numerals should be taught as continuous provision not as a discrete lesson** **Children should have secure Place Value knowledge to 10,000 including identifying 1s 10s 100s and 1000s and being about to plot numbers on a number line. They should also be able to partition numbers to 10,000 in a variety of ways and round any 4 digit number to the nearest 10,100 and 1000.**

Continuous Provision	**Previous year group learning on the 4 operations and fractions plus time shape and measure**
Key Vocabulary	**Use the language of unitising for example 70 is 7 tens 170 is one hundred and 7 tens and also 17 tens** **Ones tens hundreds thousands**
Key Facts	**Place value of each digit to 1,000,000 number bonds that relate e.g 62,000 + 38,000 = 100,000**
Skills and Knowledge **By the end of the teaching sequence children should…**	**Examples and models and images to use**
Know the place value of numbers to 1,000,000 and the value of each digit Represent numbers to 1,000,000 (This is a big	Use counters in PV chart- notice here how a PV chart is partitioned into ones, thousands, then millions

jump from 10,000 to a million so may be best to do in stages)	Make the link with measure 

Which diagram is the odd one out?





1 litre × 10 bottles

= 10 litres

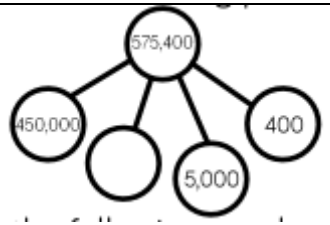
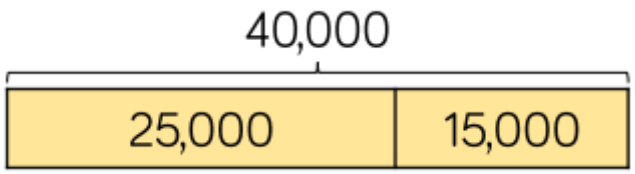
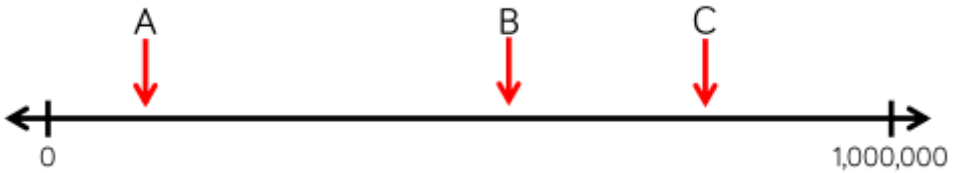
= 10,000 ml

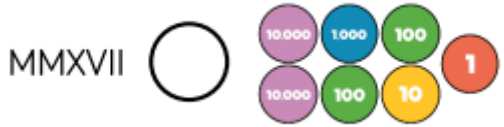
Partition numbers to 1,000,000 in a PV chart 25, 647 = 2 ten thousands , 5 thousands 6 hundreds 4 tens and 7 ones 20,000 + 5000 + 600 + 40 + 7

1,000,000	2,000,000	3,000,000	4,000,000	5,000,000	6,000,000	7,000,000	8,000,000	9,000,000
100,000	200,000	300,000	400,000	500,000	600,000	700,000	800,000	900,000
10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000	90,000
1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9

$$400{,}000 + 80{,}000 + 5{,}000 = 485{,}000$$

Millions			Thousands			Ones		
100s	10s	1s	100s	10s	1s	100s	10s	1s
								1
							1	0
						1	0	0
					1	0	0	0
				1	0	0	0	0
			1	0	0	0	0	0
		1	0	0	0	0	0	0

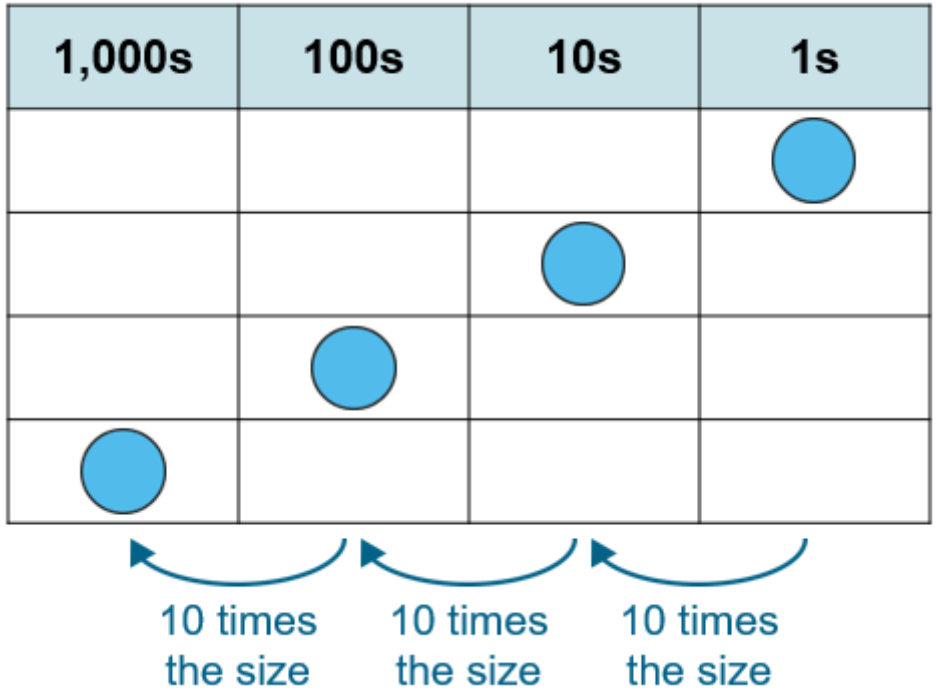
Partition numbers to 1, 000,000 in a variety of ways 25, 647 = 25 thousands, 64 tens and 7 ones or 1 5 000 + 10 000+ 300 + 300 +47	Introduce this concept with dienes as done in earlier years so children can see the numbers being split  
Order numbers to 1,000,000	
Read and write numbers to 1,000,000	
Place any number to 1,000,000 on a numberline with 100,000s	(this is from twinkl)

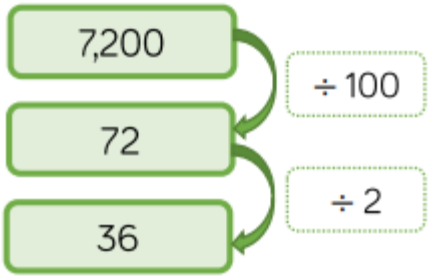
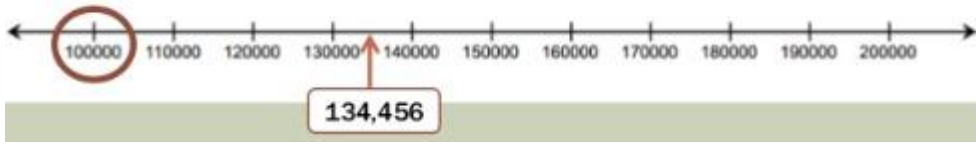
Place any number to 1,000,000 on an ENL	
Count in tens forwards and back any number to 1,000,000 including crossing boundaries	
Compare numbers to 1,000,000 using < > =	MMXVII 

Multiply and divide whole numbers by 10,100,1000

1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9

× 10 ÷ 10



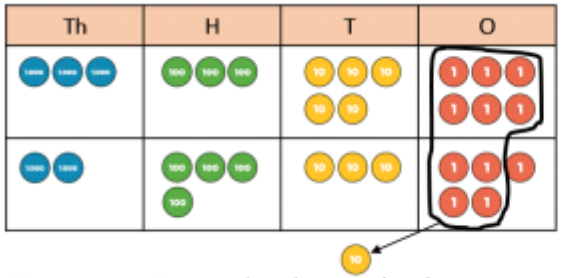
	Part of multiplication and division but makes sense to put it here as uses similar images to place value work. Images taken from NCETM 2.13 (Y4) which is best for images to show this.
Use intelligent practice to apply multiplying and dividing by 10, 100 and 1000	24 x 20 7200 ÷200  $24 \times 10 \times 2$ $= 240 \times 2$ $= 480$ $24 \times 2 \times 10$ $= 48 \times 10$ $= 480$
Show on a number line the nearest 10, 100, 1000, 10,000 and 100,000	
Round any number to the nearest 10/ 100/1000/10,000 and 100,000	Word problems with rounding in context children must notice the context here At a festival, 218,712 people attend across the weekend. Tickets come in batches of 100,000 How many batches should the organisers buy? Graduate to using a ENL as well as looking at the digits 

Autumn 1	Y5 Addition and Subtraction
Notes	**Key concepts** **Use unitising language such as 5 tens subtract 3 tens equals 2 tens, three hundreds add 4 hundreds equals 7 hundreds.** **Identifying no work, mental and jottings calculations should be part of continuous provision and once children are secure with written methods always provide calculations that don't need a formal method. Empty box calculations, moving the equals sign and balancing equations should also be part of continuous practise and number talk.** **Children should estimate their answer first** **Multi step problems should be included including multiplication and division** **Include problems with money and measure (keep previous year group objectives on the boil) and statistics (this block can be included with addition and subtraction)** **ENL strategies should be used with time and can be practised with money and measure as well** **Children should be able to adjust calculations to make them easier** **Know that addition is commutative and subtraction is not** **Be able to use the inverse to check (part whole models)** **Vocabulary: sum, total, difference, total, altogether, how many more, how much less**
By the end of the teaching sequence children should…	**Examples and models and images to use**
Add and subtract more than 4 digit numbers using the formal written method	

Use the language of uniting to explain. E.g 5 tens add 3 tens is 8 tens plus another one ten.

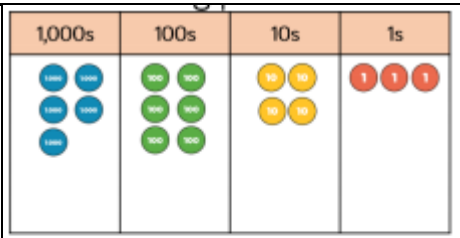
3 hundreds add 4 hundreds is 7 hundreds.etc.

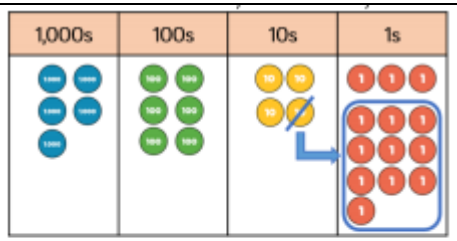
Dienes may be better than PV counters to show exchanging – see Y4 planning and progression document. PV counters can be fiddly, but work well with bigger numbers



	Th	H	T	O
	3	3	5	6
+	2	4	3	5
	5	7	9	1
			1	

Use Rosie's method to calculate:





	Th	H	T	O
	5	6	~~3~~ 2	1 3
−	4	3	1	6
	1	3	2	7

Extend children who are already confident with deliberate mistakes and missing number calculations. See White Roose and Isee reasoning for reasoning activities.

	Th	H	T	O
	4	3	5	6
+	2	4	3	5
	6	7	9	1
			1	

Use rounding to estimate answers

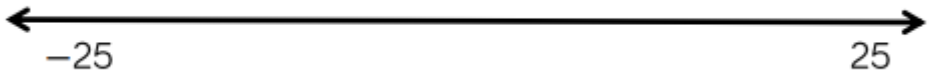
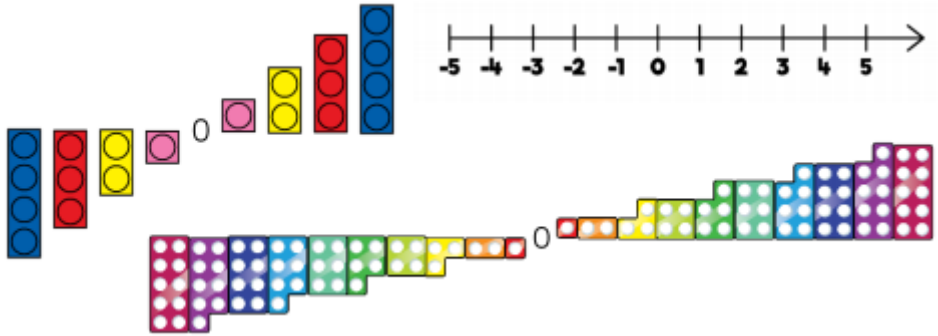
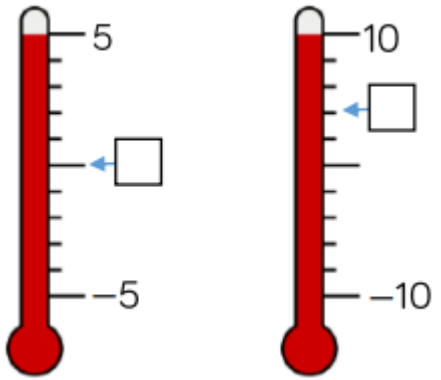
Review rounding did earlier in the term or could move rounding numbers to here

Which is best to estimate the total of 22,223 and 5,687?

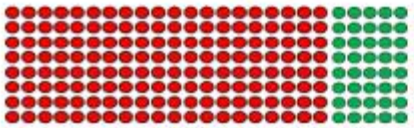
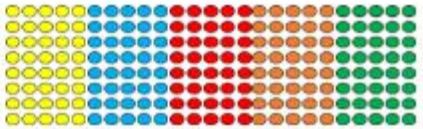
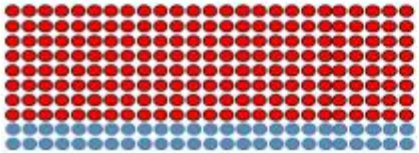
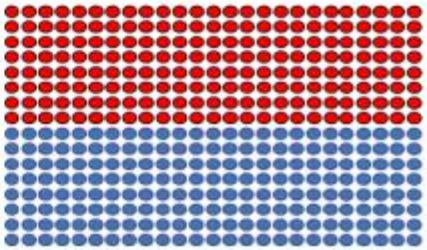
22,300 + 5,700

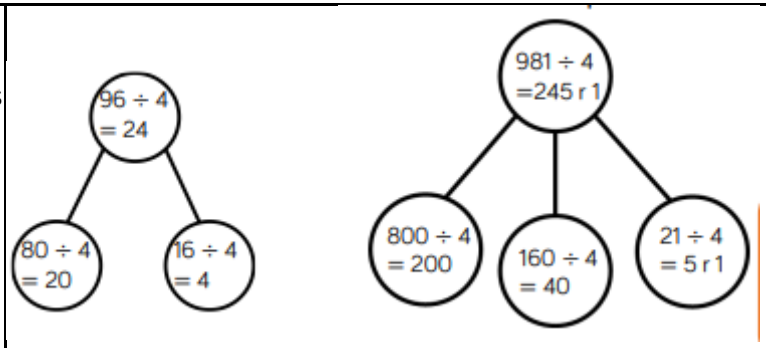
22,200 + 5,700

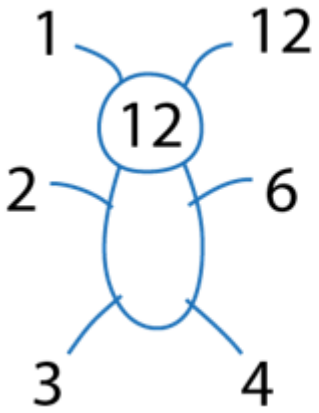
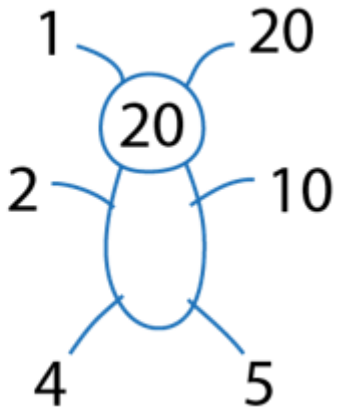
22,200 + 5,600

Be able to show negative numbers on a numberline		
Count forward and back through 0 using negative numbers	 	
Autumn 2	**Y5 Statistics**	
Notes	**This unit of work could easily be taught alongside the rounding, negative numbers and addition and subtraction strategies above rather than as a separate unit. Time should also be part of continuous provision.**	
By the end of the teaching sequence children should…	**Examples and models and images to use**	**Notes**
Read a timetable accurately and answer		Find real life timetables on the internet

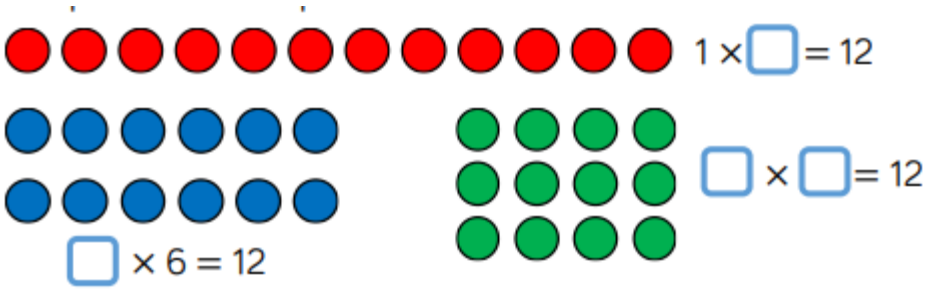
questions using ENL		
Convert units of time (continuous provision)		
Read line graphs and answers questions using ENL		
Accurately create own line graph		Link to science
Autumn 2	**Y5 Multiplication and Division**	
Notes	**Check children are fluent with all times tables to 12 x 12 and Y4 strategies Use recall facts document at the beginning of the year so any gaps can be filled before this unit. See Y4 Spring 1 for more info on written strategies that they should be confident with. NCETM 2 .21 for factors, primes and multiples**	

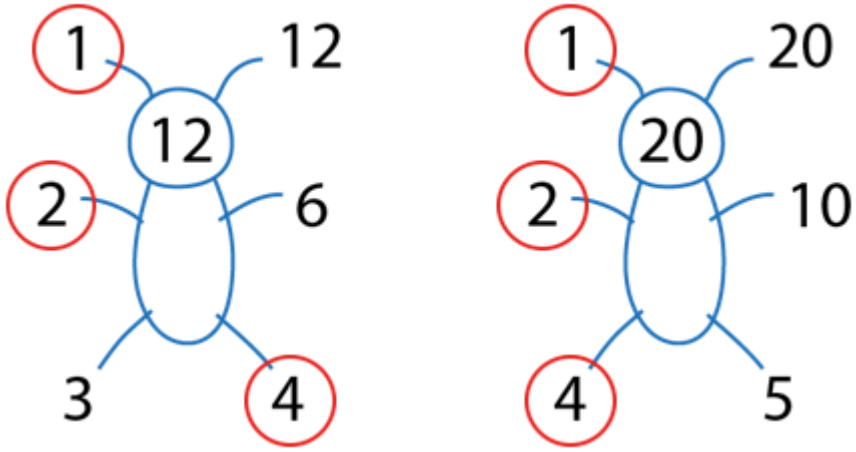
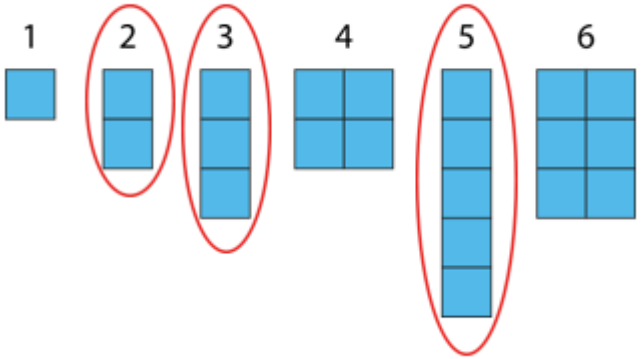
By the end of the teaching sequence children should…	Examples and models and images to use
Be able to multiply mentally or with jottings by partitioning in a variety of ways (revision of Y4)	Method 1 $25 \times 8 = 20 \times 8 + 5 \times 8$ $= 160 + \square = \square$  Method 2 $25 \times 8 = 5 \times 5 \times 8$ $= 5 \times \square = \square$  Method 3 $25 \times 8 = 25 \times 10 - 25 \times 2$ $= \square - \square = \square$  Method 4 $25 \times 8 = 50 \times 8 \div 2$ $= \square \div \square = \square$  See Jo Boaler's work on this.

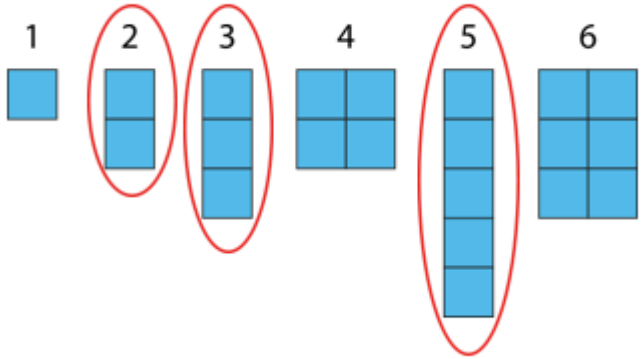
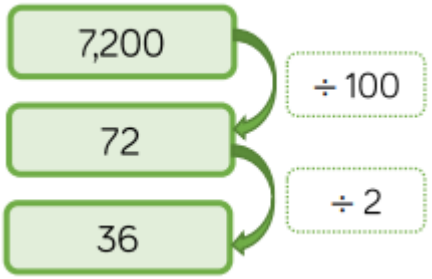
Can divide mentally or with jottings by partitioning a number (revision of Y4)	
Can multiply and divide using known facts such as place value, times tables, doubling and halving the factors	
Understand multiples and common multiples	

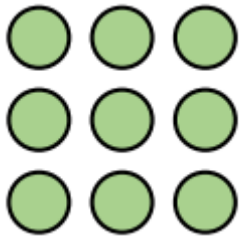
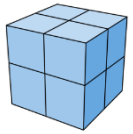
Understand and find factors of a number – images from Y4	 	Make arrays using counters to find factors of the same product. Use x table square to make arrays

×	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144



Understand and find common factors	Teach children to be systematic by starting at 1 x then 2 x 
Understand what a prime number is and re call prime numbers to 20	Can't make an array with a prime number! 

Understand what a composite number is	 You can make an array with a composite number!
Can multiply and divide using factor and multiple knowledge	 X 200 same as x 100 and x 2 x 500 same as x 1000 and dividing by 2 ÷ 200 the same as ÷ 100 then ÷ 2 **see above**
Create and complete extended multiplication and division facts	**Fact triangle 4 x 6 = 24 40 x 6 = 240 4 x 60 = 24 40 x 60 = 2400 24 ÷ 6 = 4 240 ÷ 6 = 40 ¼ of 24 = 6 etc.**

Understand and identify square numbers	Make squares out of counters to show concept. 	Volume and area will both be taught in more detail in the summer term but either make links here or teach together here. See NCETM 2.20 for volume and x 3 factors. See NCETM 2.16 for area and perimeter
Know all square numbers to 12 x 12	Use a multiplication grid to show square numbers making a square.	
Understand and identify cube numbers	Make cubes out of multilink to show concept. 	

Spring 1	**Y5 Multiplication and Division written methods**
Notes: children should be competent with the area model from Y4 so should be an easy step on to 2d by 2d. No larger numbers should be used with the area model as it is not efficient. Unitising language should be used – one ten multiplied by two tens equals two tens as per key concepts.	
By the end of the teaching sequence children should…	**Examples and models and images to use**

Multiply 3d by 1 d using the area model (reviewed from Y4) and formal method.

	500	20	1
3	**1, 500**	**60**	**3**

$521 \times 3 = 500 \times 3 + 20 \times 3 + 1 \times 3$

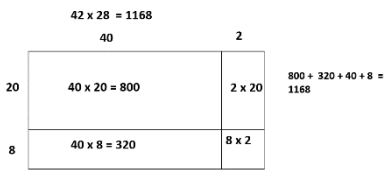
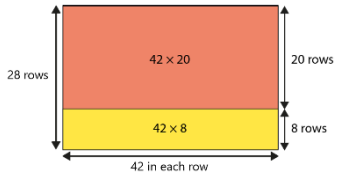
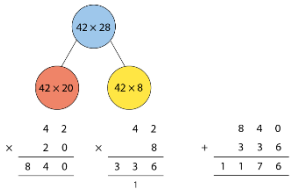
$= 1{,}500 + 60 + 3$

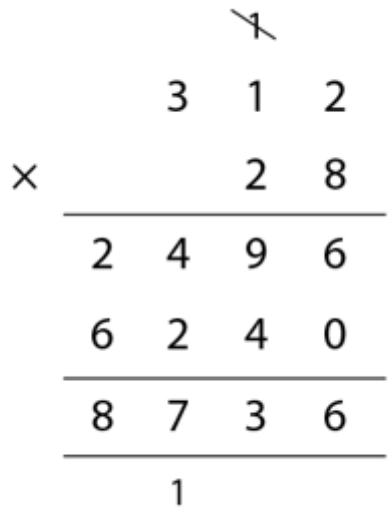
$= 1{,}000 + 500 + 60 + 3$

$= 1{,}563$

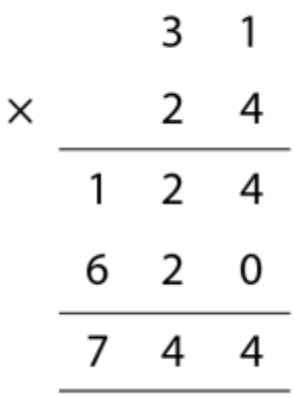
	1,000s	100s	10s	1s
		5	2	1
×				3
1 ones x 3 = 3 ones				3
2 tens x 3 = 6 tens			6	0
5 hundreds x 3 = 15 hundreds	1	5	0	0
= 1 thousand + 5 hundreds	1	5	6	3

		5	2	1
×				3
	1	5	6	3

Multiply 2 d by 2d with the area model using PV counters and Cuisenaire rods See NCETM 2.23	  
Multiply 2 d by 2d with long multiplication	See NCETM 2.23. Use expanded first then abstract algorithm.
Multiply 3 d by 2d with long multiplication	
Multiply 4 d by 2d with long multiplication	



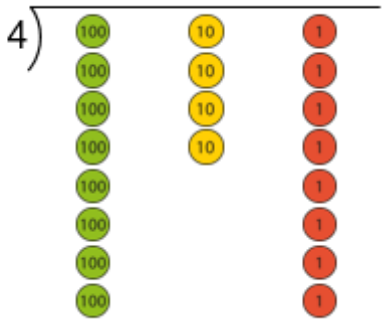
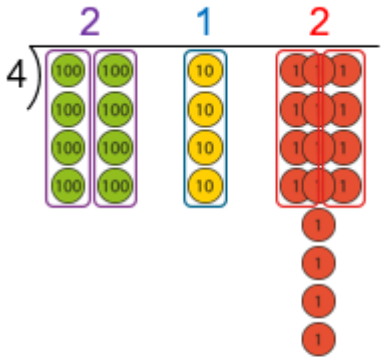
100s	10s	1s	
	3	1	
×	2	4	
1	2	4	31×4
6	2	0	31×20
7	4	4	

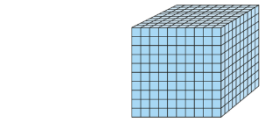
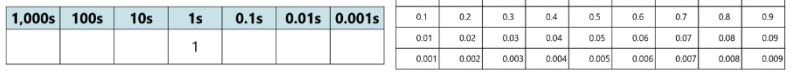
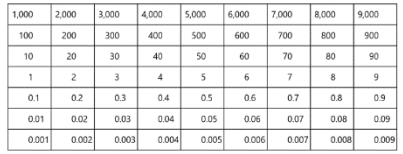
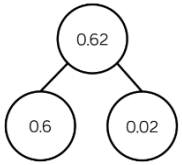


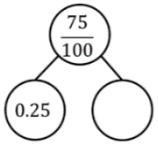
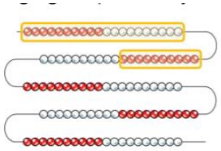
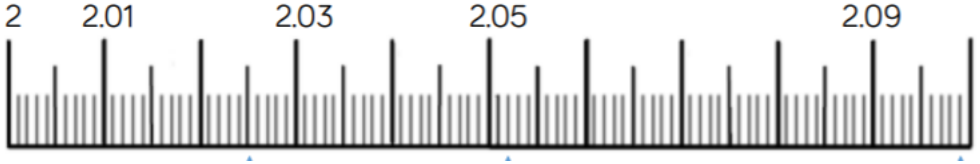
1,000s	100s	10s	1s	
	3	1	2	
×		2	8	
2	4	9	6	312×8
6	2	4	0	312×20
8	7	3	6	
	1			

Divide 3d by 1d using short division and PV counters NCETM 2.15

84 ÷ 4 = 21	$\begin{array}{r} 2\ 1 \\ 4\overline{)\ 8\ 4} \end{array}$
dividend ÷ divisor = quotient	$\begin{array}{r} \text{quotient} \\ \text{divisor}\overline{)\text{dividend}} \end{array}$

	2 $4\overline{)8\ 4\ 8}$  $\begin{array}{r} 2\ 1 \\ 4\overline{)8\ 4\ 8} \end{array}$  8 hundreds ÷ 4 = 2 hundreds 4 tens ÷ 4 = 1 ten 8 ones ÷ 4 = 2 ones
Divide 3d by 1d using short division	

Divide 4d by 1d using short division		
Interpret remainders (round up or round down according the question)		
Solve mixed operation problems		Also with Spring 2
Spring 2	**Y5 Decimals and Fractions**	
Notes: Not necessary to do any rounding or PV to 3 dp as that can be covered in Y6. Use context of measure and money (see WR Maths) to give a real life context and review learning from Y3 and Y4 on measurement. NCETM 3.10 WRMaths		
By the end of the teaching sequence children should…	**Examples and models and images to use**	
Understand the concept of tenths, hundredths and thousandths that there are 10 tenths in a whole, 10 hundredths in a tenth and 100 hundredths a whole	1000 square As 1 whole   	
Represent decimals in a place value chart		
Represent decimals as fractions		

Partition decimals and fraction equivalent according PV 6 . 24 6 + 0.2+ 0.04 6 + 2/10 + 4/100	
Partition decimals and fraction equivalent a variety of ways 6.24 62 tenths and 4 hundredths 6 + 24/100	
Read and write decimal numbers as numerals and fractions 0.71 71/100	  
Count in decimals and place decimals to 1 dp on a number line	
Count in decimals and place decimals to 2 dp on a number line	
Compare decimal numbers to 2 dp	
Round decimals to the nearest whole on a number line	

Round decimals to the 1 dp on a number line
X and ÷ decimal numbers by 10, 100, 1000
Convert between units of measurements: Re view fractions 1 ½ km
Add and subtract decimals using ENL strategies and formal methods (use PV counters and dienes first).

Note: these are images only – please check that calculations are suitable for formal methods.

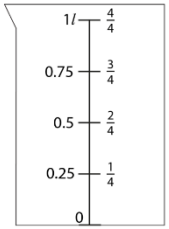
Using complements to 1

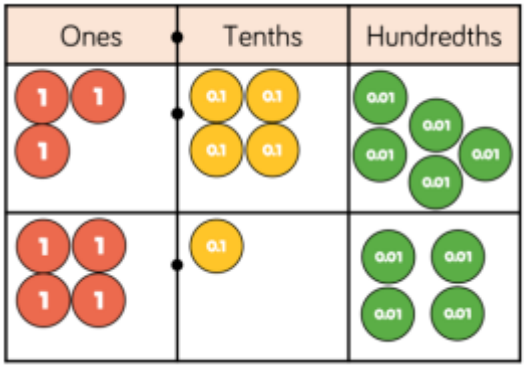
0.45 + 0.67 =

0.55 + 0.12

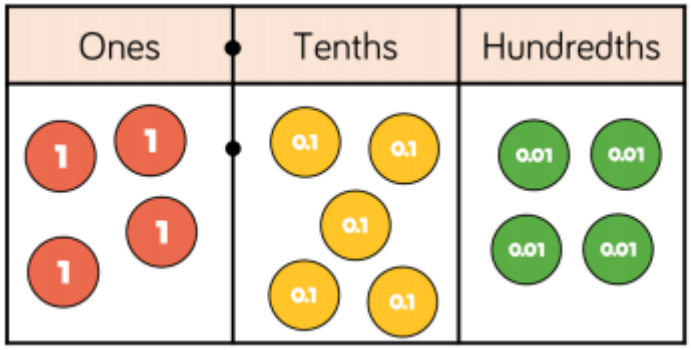
0.45 + 0.55 + 0.12 = 1.12

A number line but just the other way round

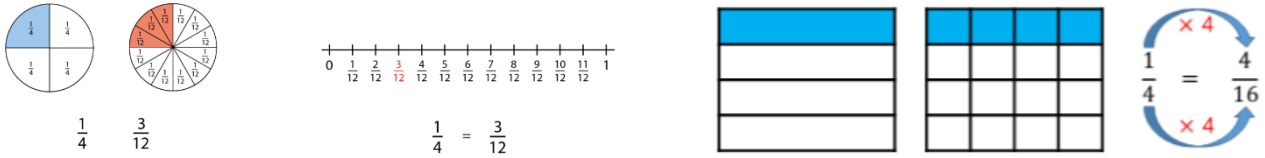
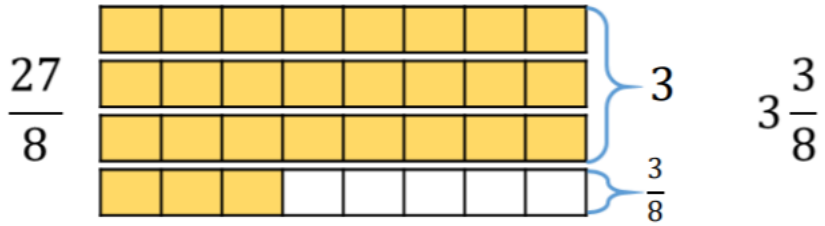


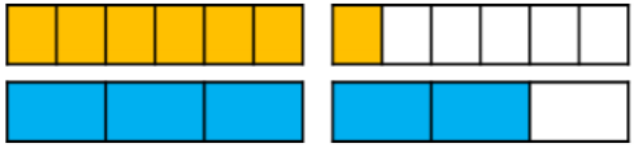


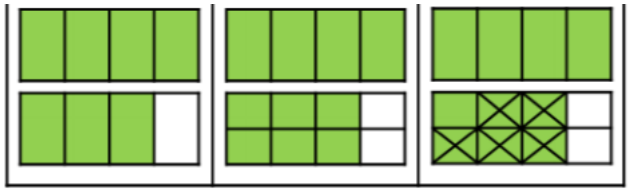
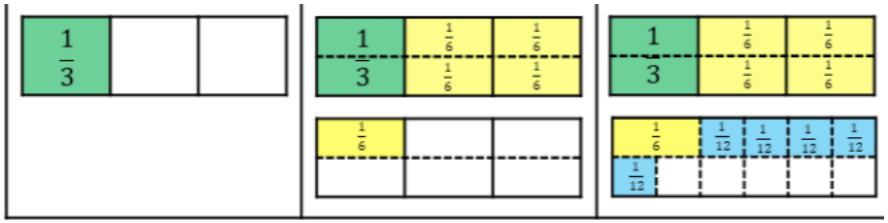
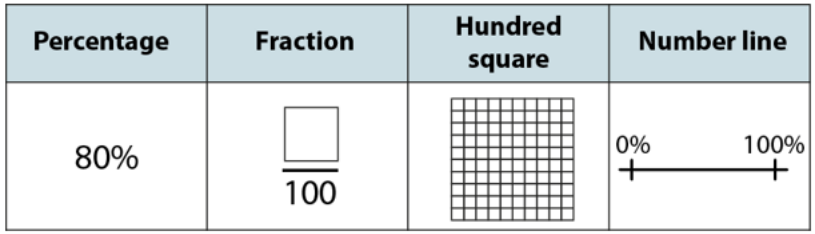
$$\begin{array}{r} 3.45 \\ +\ 4.14 \\ \hline \\ \hline \end{array}$$



$$\begin{array}{r} 4.54 \\ -\ 1.4 \\ \hline \\ \hline \end{array}$$

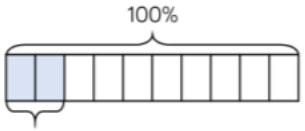
Summer 1	Y5 Fractions, Decimals and percentages
Notes: Review fraction objectives from Y4 – these should be kept on the boil See Y4 Spring 2	
By the end of the teaching sequence children should…	**Examples and models and images to use NCETM 3.7 and 3.10 plus White Rose**
Write, identify and represent visually equivalent fractions	
Convert from mixed to improper fractions and back again	

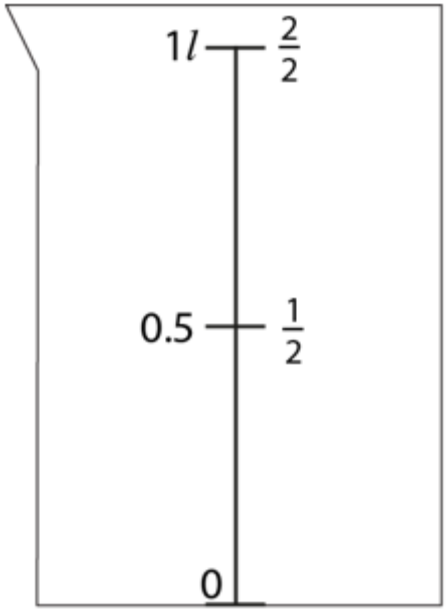
Compare and order fractions whose denominators are multiples of the same number Compare using numerator and denominator	Use bar models to compare $\frac{7}{6}$ and $\frac{5}{3}$ 

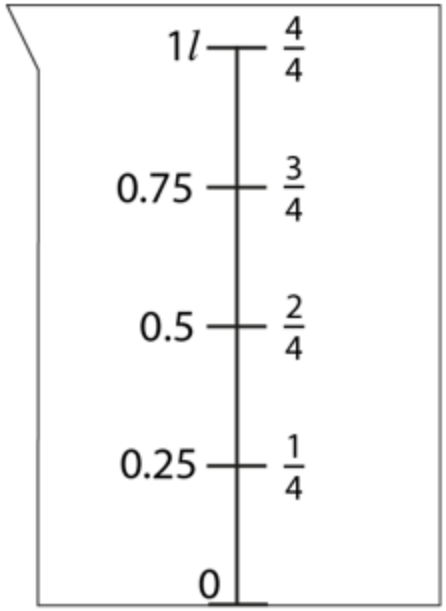
Add and subtract fractions whose denominators are multiples of the same number. Review adding and subtracting fractions with the same denominator from Y4.	$\frac{1}{2}+\frac{1}{8}=\frac{4}{8}+\frac{1}{8}=\frac{5}{8}$  $1\frac{3}{4}-\frac{5}{8}=1\frac{1}{8}$  $\frac{1}{3}+\frac{5}{6}+\frac{5}{12}=1\frac{7}{12}$
Understand that percent means part of 100 NCETM 3.10	
Visually represent	

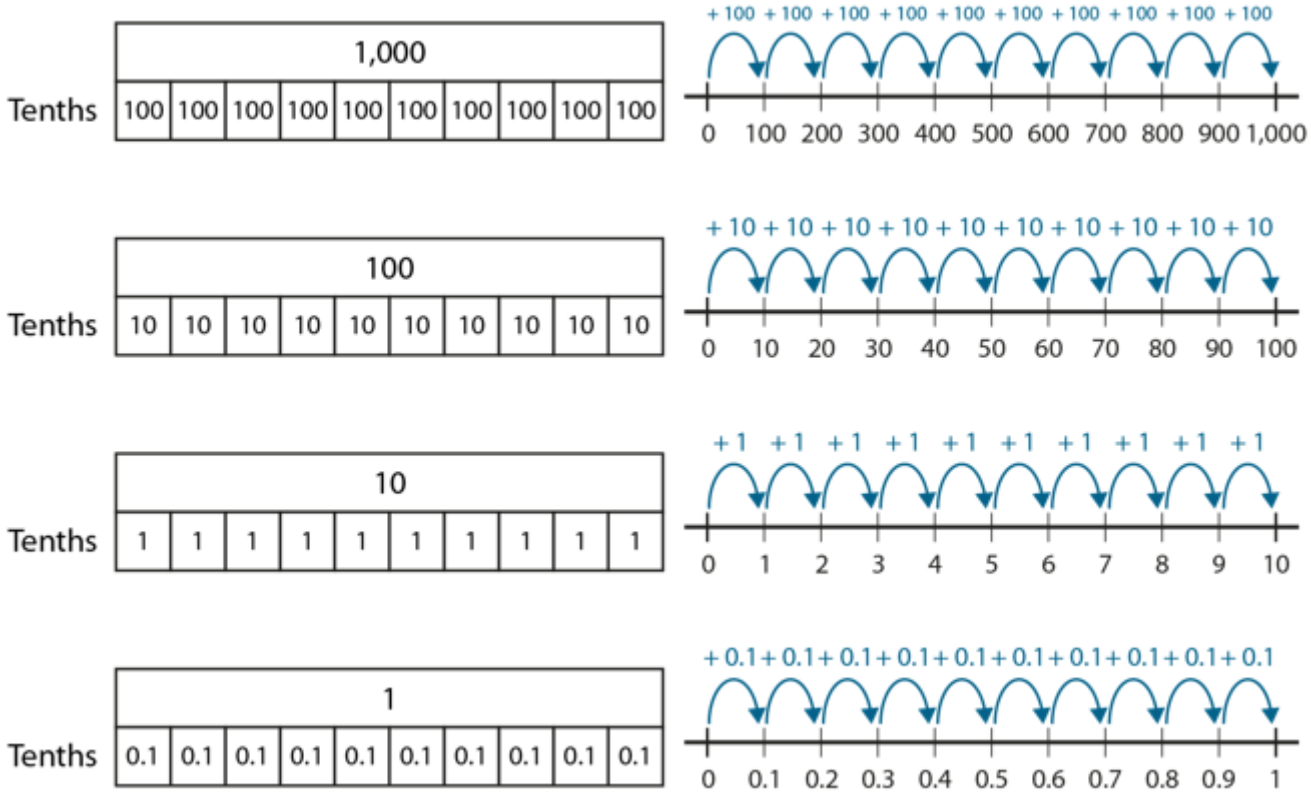
Percentage	Fraction	Hundred square	Number line
80%	$\frac{\square}{100}$		0% 100%

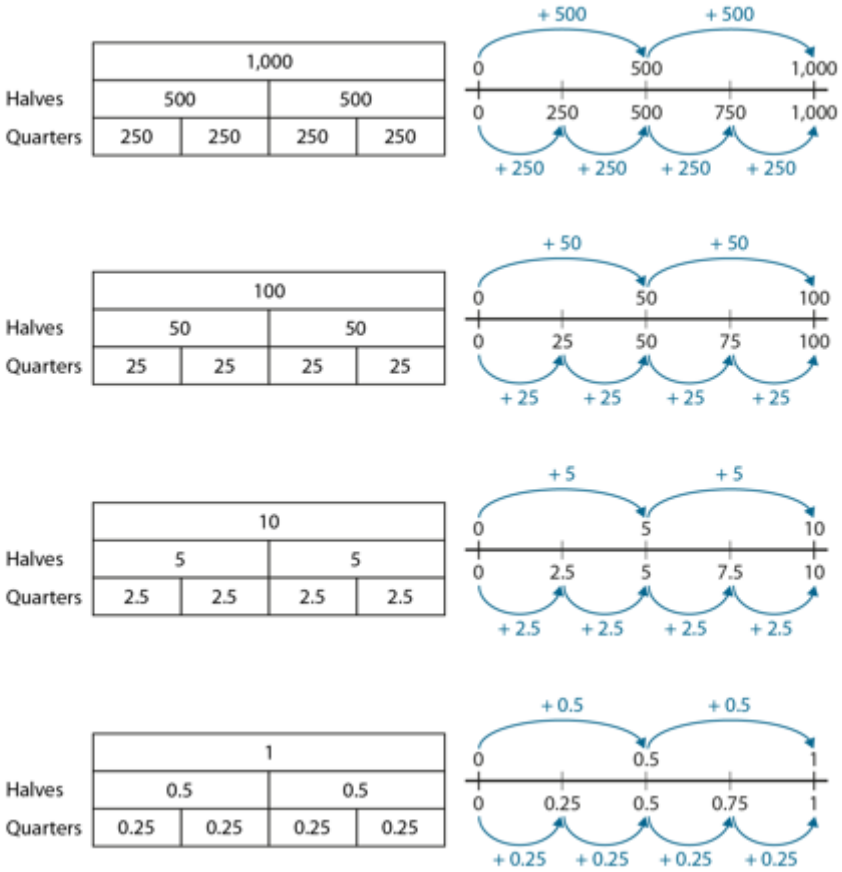
percentages	
Link percent with tenths and hundredths	
Write percentages as fractions and decimals	
Write tenths as fractions, decimals, words and images	
Know the decimal and percentage equivalents of ¼ ½ 1/5	

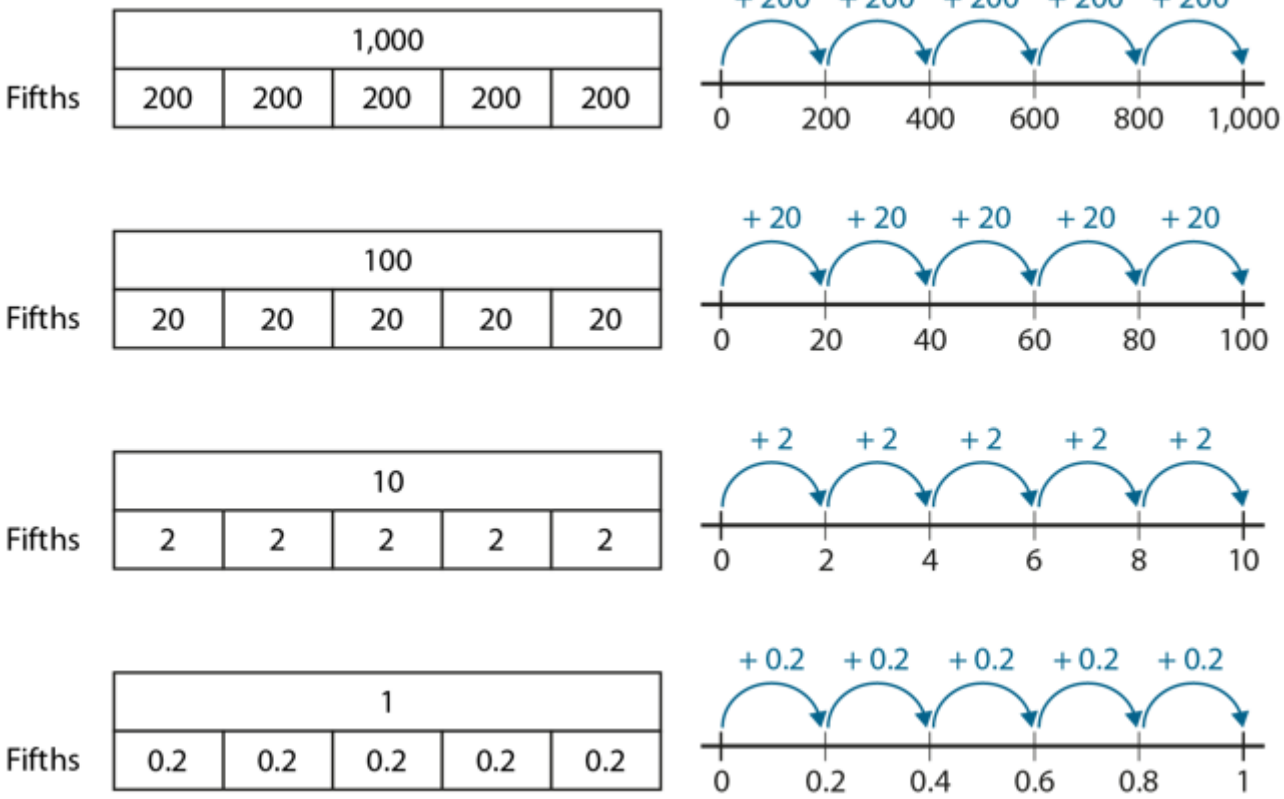




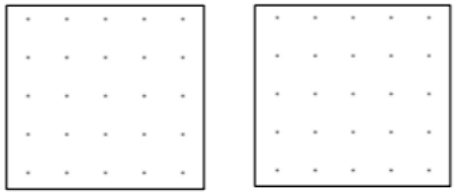


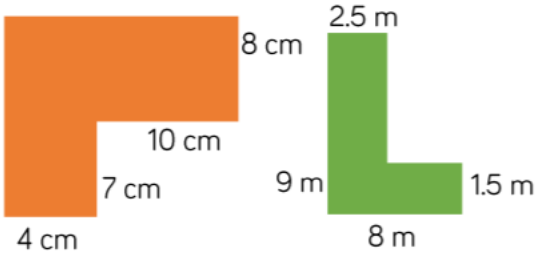
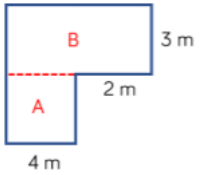
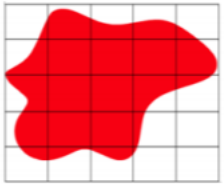
and non-unit fractions of these denominators	
Know the percentage and decimal equivalents of fractions that have a denominator with a multiple of 10 or 25	

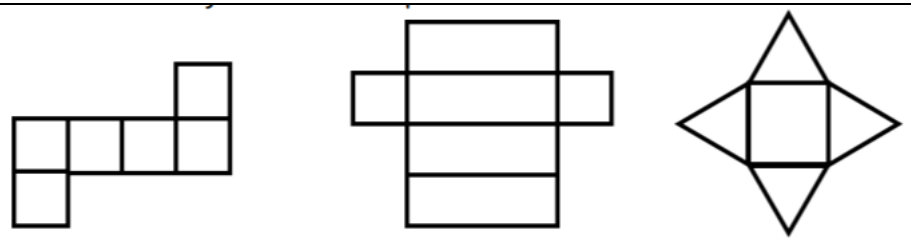
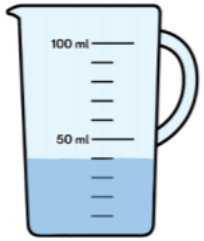
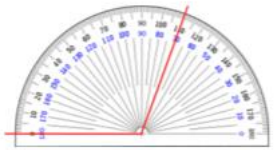
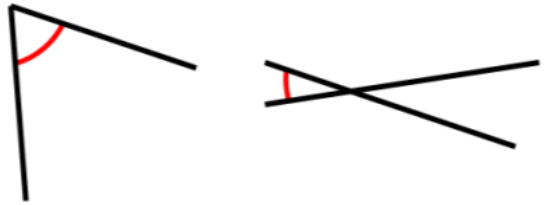

1,000
Halves
500
500
Quarters
250
250
250
250
+ 500
+ 500
0
500
1,000
0
250
500
750
1,000
+ 250
+ 250
+ 250
+ 250
100
50
50
25
25
25
25
+ 50
+ 50
0
50
100
0
25
50
75
100
+ 25
+ 25
+ 25
+ 25
10
5
5
2.5
2.5
2.5
2.5
+ 5
+ 5
0
5
10
0
2.5
5
7.5
10
+ 2.5
+ 2.5
+ 2.5
+ 2.5
1
0.5
0.5
0.25
0.25
0.25
0.25
+ 0.5
+ 0.5
0
0.5
1
0
0.25
0.5
0.75
1
+ 0.25
+ 0.25
+ 0.25
+ 0.25

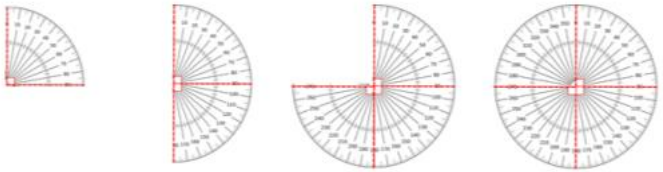
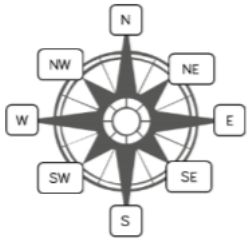
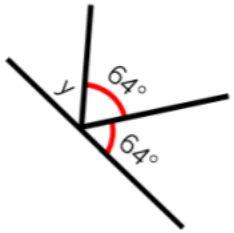
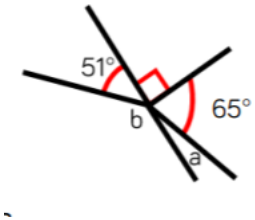


Summer 2	**Y5 Shape and position**
Notes: use this opportunity to review measure, squares numbers and fractions. Also review efficient methods of calculating.	
By the end of the	**Examples and models and images to use**

teaching sequence children should…	
Identify and draw 2D shapes	Draw a regular polygon and an irregular polygon on the grids. 
Understand regular and irregular shapes	Sort the shapes in to irregular and regular polygons. What's the same? What's different?
Identify and draw quadrilaterals	
Measure and calculate the perimeter of rectiline	

ar shapes	
Measure and calculate the perimeter of composite rectilinear shapes	
Calculate and compare areas of rectangles including squares	
Estimate the area of irregular shapes	

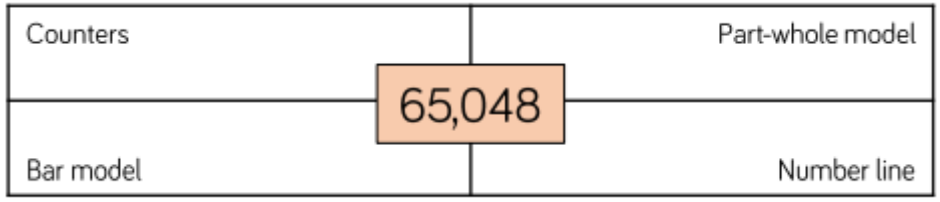
Identify 3d shapes	
Estimate volume (using cubes and cuboids) and capacity	 Match the containers to their estimated capacity. 5,000 ml 500 ml 5 ml
Draw and measure angles in degrees	 
Be able to use a protract or	

accurately	
Order and compare angles	
½ turn = 180 1 ½ turns etc full turn – 360 use multiples of 90	 
Calculate missing angles on a straight line and round a point	 
Plot and draw shapes on a co-ordinates grid	
Translate shapes	

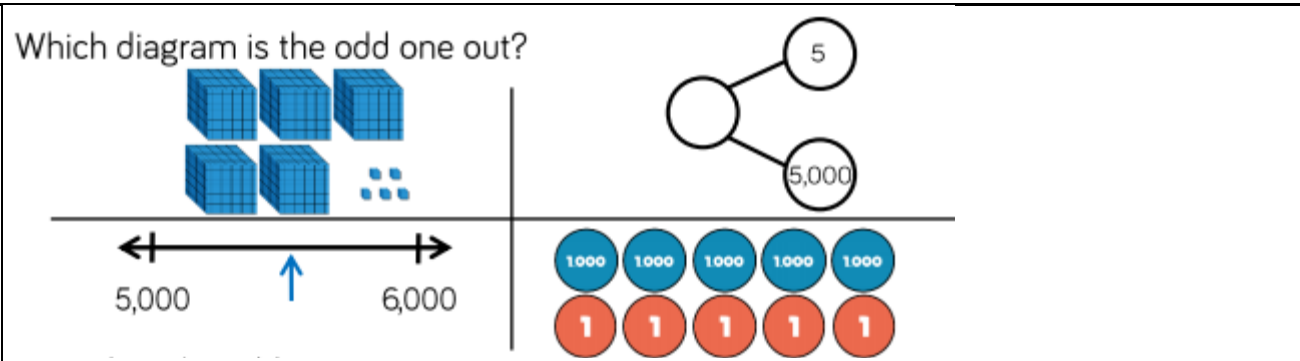
on a co-ordinates grid	

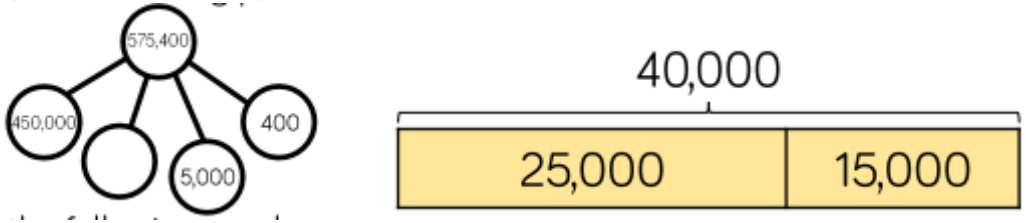
Year 6 Progression

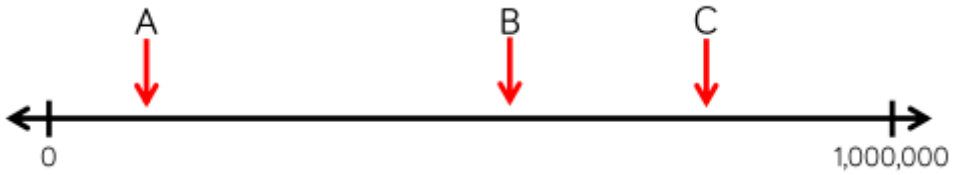
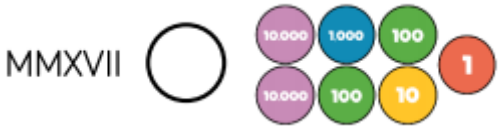
Autumn 1	Y5 Place Value and addition and subtraction strategies	
By the end of the teaching sequence children should…	**Examples and models and images to use**	**Notes**
See Y5 Autumn 1 & 2		**Recall facts document should also be used as continuous provision/ assessment to check children are secure on Y5 objectives. Previous CT should have noted any gaps on previous**

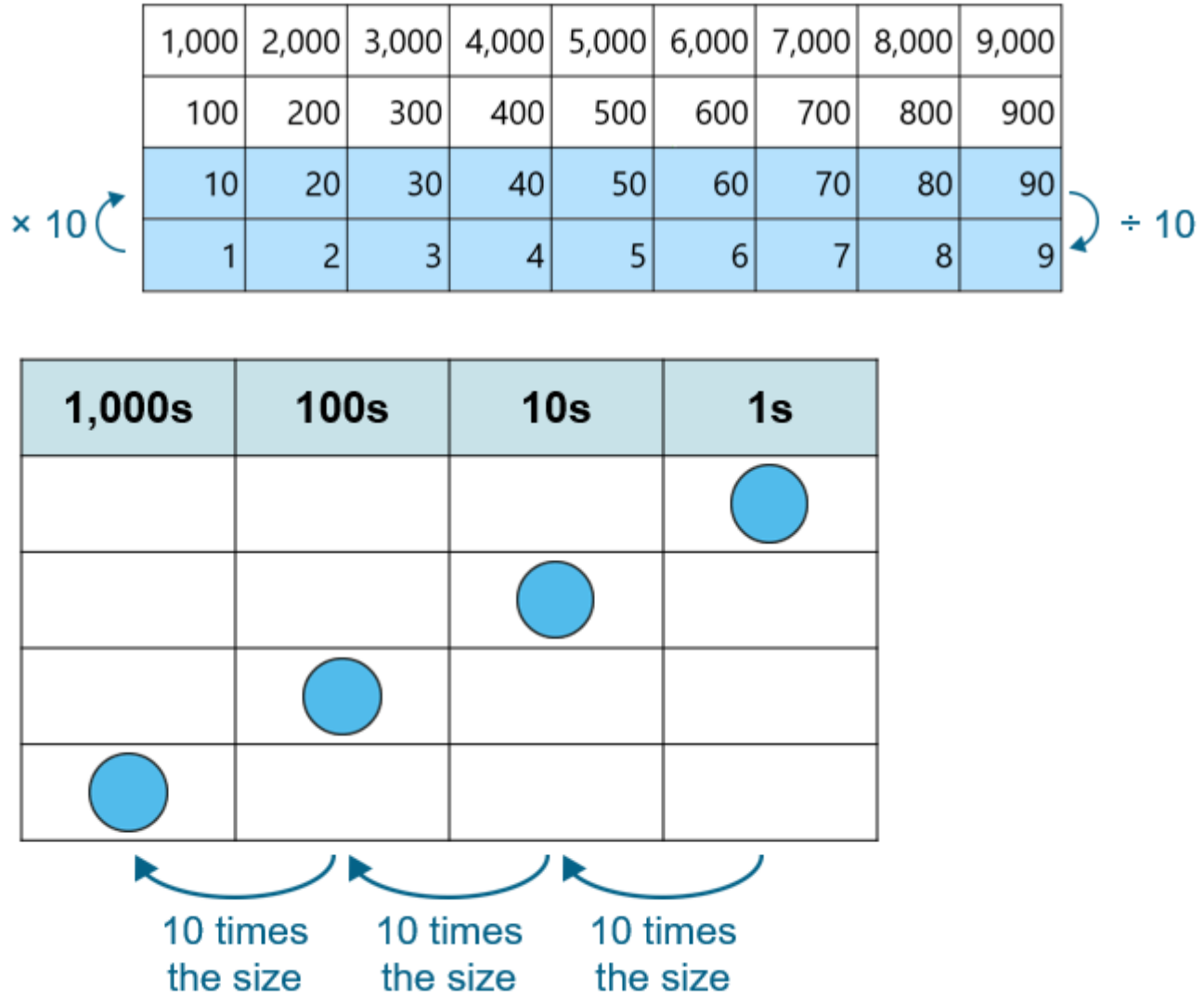
		recall facts document
Autumn 1	**Y6 Place Value**	
By the end of the teaching sequence children should…	**Examples and models and images to use**	**Notes**
Know the place value of numbers to 10,000,000 and the value of each digit	Use PV counters to model and place value chart	Mix smaller and larger numbers .Although children need practise with larger numbers smaller numbers shouldn't be forgotten
Represent numbers to 10,000,000		Make the link with measure

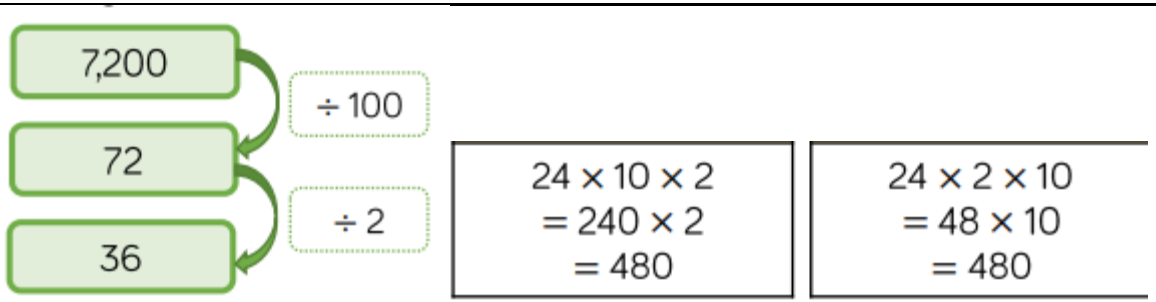
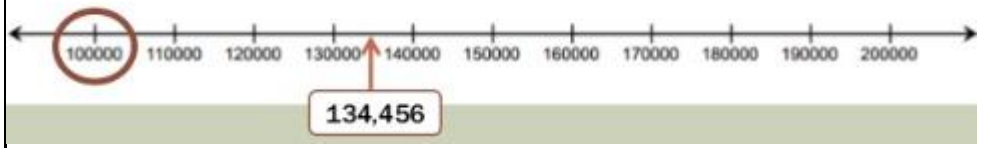
Millions			Thousands			Ones		
100s	10s	1s	100s	10s	1s	100s	10s	1s
								1
							1	0
						1	0	0
					1	0	0	0
				1	0	0	0	0
			1	0	0	0	0	0
		1	0	0	0	0	0	0

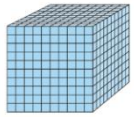
	 1 litre × 10 bottles = 10 litres = 10,000 ml	
Partition numbers to 10,000,000 in a PV chart	25, 647 = 2 ten thousands , 5 thousands 6 hundreds 4 tens and 7 ones PV chart and counters 20,000 + 5000 + 600 + 40 + 7	

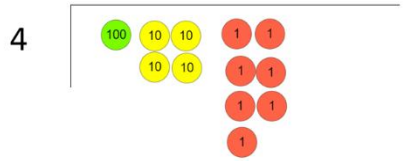
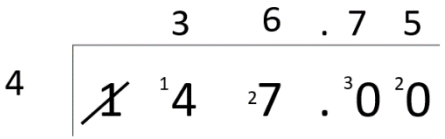
	<table><tr><td>1,000,000</td><td>2,000,000</td><td>3,000,000</td><td>4,000,000</td><td>5,000,000</td><td>6,000,000</td><td>7,000,000</td><td>8,000,000</td><td>9,000,000</td></tr><tr><td>100,000</td><td>200,000</td><td>300,000</td><td>400,000</td><td>500,000</td><td>600,000</td><td>700,000</td><td>800,000</td><td>900,000</td></tr><tr><td>10,000</td><td>20,000</td><td>30,000</td><td>40,000</td><td>50,000</td><td>60,000</td><td>70,000</td><td>80,000</td><td>90,000</td></tr><tr><td>1,000</td><td>2,000</td><td>3,000</td><td>4,000</td><td>5,000</td><td>6,000</td><td>7,000</td><td>8,000</td><td>9,000</td></tr><tr><td>100</td><td>200</td><td>300</td><td>400</td><td>500</td><td>600</td><td>700</td><td>800</td><td>900</td></tr><tr><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td><td>60</td><td>70</td><td>80</td><td>90</td></tr><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr></table> 400,000 + 80,000 + 5,000 = 485,000	
Partition numbers to 10, 000,000 in a variety of ways	25, 647 = 25 thousands, 64 tens and 7 ones or 15 000 + 10 000+ 300 + 300 +47 PV counters 	Review partitioning in different ways from earlier years with dienes
Order numbers to 10,000,000		Use number line and concrete apparatus for linear PV knowledge and columnar PV knowledge

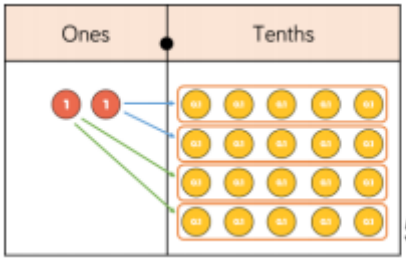
Read and write numbers to 10,000,000		
Place any number to 10,000,000 on a numberline with 100,000s		
Place any number to 10,000,000 on an ENL		
Compare numbers to 10,000,000 using < > =	PV chart and counters and ENL  	

Multiply and divide whole numbers by 10,100,1000		Part of multiplication and division but makes sense to put it here as uses PV chart Images taken from NCETM 2.13 (Y4) which is best for images to show this.

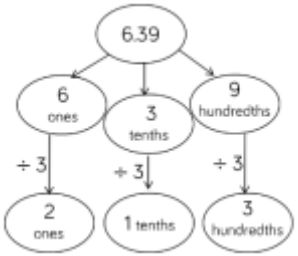
Use intelligent practice to apply multiplying and dividing by 10, 100 and 1000		
Round any number to the nearest 10/ 100/1000/10,000 and 100,000	ENL - word problems – using rounding to estimate At a festival, 218,712 people attend across the weekend. Tickets come in batches of 100,000 How many batches should the organisers buy? 	Review below when calculating – using rounding to estimate
Read, write and order decimals to 3dp	See Y5 for decimals to 2 dp 	Review fractions e.g tenths, hundredths

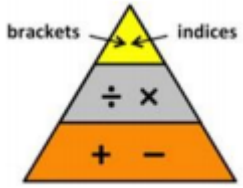
	<table><tr><th>Hundreds</th><th>Tens</th><th>Ones</th><th>Tenths</th><th>Hundredths</th><th>Thousandths</th></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> <table><tr><td>1,000</td><td>2,000</td><td>3,000</td><td>4,000</td><td>5,000</td><td>6,000</td><td>7,000</td><td>8,000</td><td>9,000</td></tr><tr><td>100</td><td>200</td><td>300</td><td>400</td><td>500</td><td>600</td><td>700</td><td>800</td><td>900</td></tr><tr><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td><td>60</td><td>70</td><td>80</td><td>90</td></tr><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr><tr><td>0.1</td><td>0.2</td><td>0.3</td><td>0.4</td><td>0.5</td><td>0.6</td><td>0.7</td><td>0.8</td><td>0.9</td></tr><tr><td>0.01</td><td>0.02</td><td>0.03</td><td>0.04</td><td>0.05</td><td>0.06</td><td>0.07</td><td>0.08</td><td>0.09</td></tr><tr><td>0.001</td><td>0.002</td><td>0.003</td><td>0.004</td><td>0.005</td><td>0.006</td><td>0.007</td><td>0.008</td><td>0.009</td></tr></table>  <table><tr><th>1,000s</th><th>100s</th><th>10s</th><th>1s</th><th>0.1s</th><th>0.01s</th><th>0.001s</th></tr><tr><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td></tr></table>	
Autumn 1	**Y6 Four operations**	
By the end of the teaching sequence children should…	**Examples and models and images to use**	**Notes**
Solve problems using 4 operations and choose the most effective strategy including ENL strategies for time, termperature, money etc.	**See Y3, 4 and 5 or each separate operation progression document (still to do June 2020)**	Children should be fluent with the 4 operations by the end of Year 5. Review all strategies mental and written and use as chance

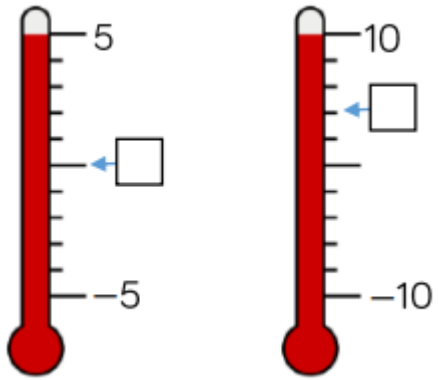
		review things such as time, measure, reading tables and fractions of amount and statistics see Y5
Divide 4d by 2d and interpret remainders as fractions and decimals	**Use PV counters. Know that the denominator is the divisor and remainder is the numerator** **147 ÷ 4 = 36 r 3 or 36. 75 or 36 and ¾ and can be solved in a variety of ways e.g mentally/ jottings using table knowledge or with PV counters**   **If know that ¾ = 0.75 don't need to use formal method to find decimal equivalent.**	Review of FD equivalence

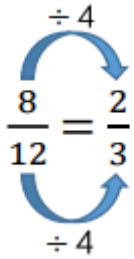
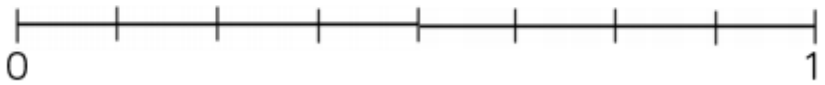
<table>
<tr>
<td>Use short division to find fractions from decimals</td>
<td> 

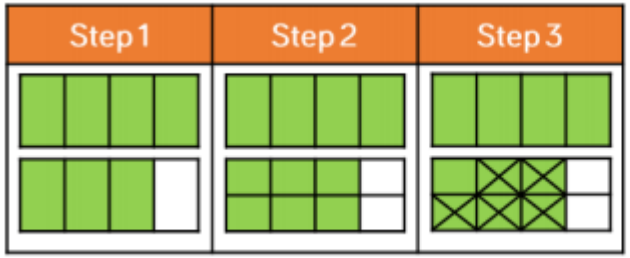
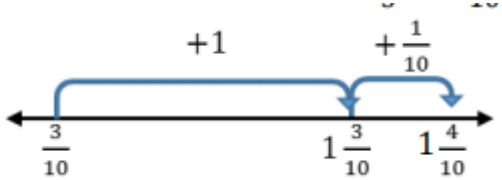
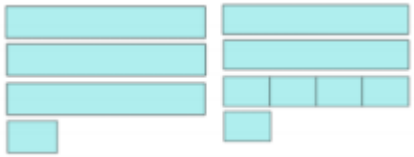
$5\overline{)2.0}$ 0.4
2/5 as a decimal</td>
<td>Concept of line between numerator and denominator meaning division introduced in Y3</td>
</tr>
<tr>
<td>Multiply and divide decimals by integers</td>
<td>1.212 x 3 use grid method/ area model used with whole numbers

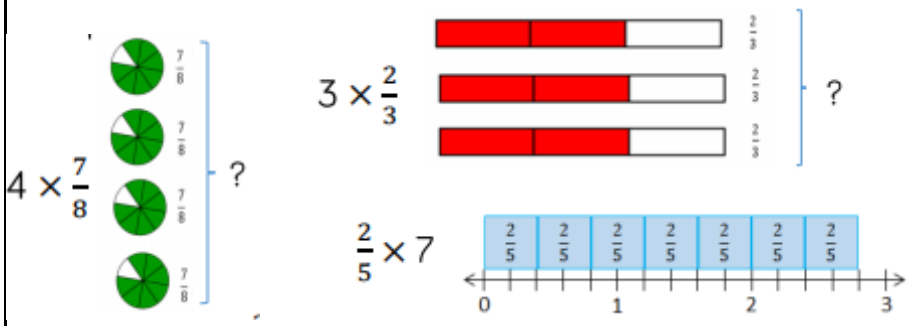
2. 34 x 5 = 11.7
<table>
<tr><th>x</th><th>2</th><th>0.3</th><th>0.04</th></tr>
<tr><td>5</td><td>10</td><td>1.5</td><td>0.2</td></tr>
</table>
6.39 ÷ 3
 
</td>
<td>Same as whole numbers use no work, mental, jottings and written. Don’t necessarily need written methods</td>
</tr>
</table>

Solve calculations which involve the 4 operations	6 x 4 + 40 ÷ 10 General rule is that you read from left to right because x/ ÷and +/- are inverses of each other doesn't really matter which order which is why the triangle works. Triangle is more useful than BODMAS although BODMAS easier to remember! 	
Use rounding to estimate answers	Which is best to estimate the total of 22,223 and 5,687? 22,300 + 5,700 22,200 + 5,700 22,200 + 5,600	
Identify a no work calculation, mental jottings and written		Across key stage
Be able to show negative numbers on a numberline Count forward and back through 0 using negative numbers Calculate intervals across zero	Use ENL 	From Y4 and Y5

		
Autumn 2	**Y6 Fractions**	
Notes	**Review all of Y5 teaching on fractions**	
By the end of the teaching sequence children should…	**Examples and models and images to use**	**Notes**
Identify common factors and common multiples including lowest common factor and lowest common multiple.	**Teach children to be systematic** Multiples of 6: 6, 12, 18, 24 Multiples of 4: 4, 8, 12, 16, 12 is the LCM of 4 and 6 Factors of 8: 1 , 2 , 4 , 8 Factors of 12: 1 , 2 , 3 , 4 , 6 , 12 4 is the highest common factor.	**Review factors, primes to 100, multiples Square no.s and cube no.s all Y5**

Use common factors to simplify fractions	 Factors of 8: 1 , 2 , 4 , 8 Factors of 12: 1 , 2 , 3 , 4 , 6 , 12 4 is the highest common factor. Simplify 8/12	
Compare fractions by finding common denominators	When the denominators are the same, the greater the numerator the greater the fraction	**Review comparing fractions with common denominators**
Compare fractions by finding common numerators	When the numerators are the same, the smaller the denominator the greater the fraction	**Review comparing fractions with common numerators**
Put fractions on a numberline	Place $\frac{1}{4}, \frac{1}{2}, \frac{1}{8}, \frac{5}{8}, \frac{7}{8}$ and $\frac{3}{16}$ on the number line. 	**Done across the Key Stage Y5/6 mixed denominators**

Add and subtract fractions with different denominators and mixed numbers and give the answer in its simplest form	 $1\frac{3}{4} - \frac{5}{8} = 1\frac{1}{8}$  Find the difference between 3/10 and 1 2/5 1 2/5 = 1 4/10 **Use ENL strategies** 3 ¼ - 1 ¾ exchange one whole for 4/4 so 2 5/4 – 1 ¾  $1\frac{1}{3} + 2\frac{1}{6} = 3 + \frac{3}{6} = 3\frac{3}{6}$ or $3\frac{1}{2}$ **Adding wholes first then fractions. Empty box problems**	**Important as in adding and subtracting with whole numbers that children have a variety of strategies to fall back on and there is a discussion as to which is the most efficient. Als o use same type of empty box and intelligent practise style questions you would use with whole numbers. Fully review converting mixed and improper fractions from Y5 first.**

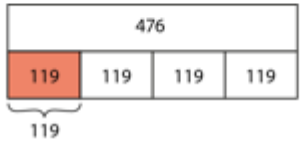
	$4\ \frac{5}{6} + \square\frac{\square}{\square} = 10\ \frac{1}{3}$	
Add and subtract 3 sets of fractions including mixed numbers and improper fractions	$\frac{1}{2} - \frac{1}{10} - \frac{1}{5} = \frac{2}{10}$	
Multiply mixed numbers and fractions by whole numbers as repeated addition using visual images to demonstrate understanding	7 x ¾ means ¾ 7 times 	
Multiply mixed numbers and fractions by whole numbers as part of a number and understand when this is more efficient	100 x ¾ meaning ¾ of 100 = 75	

$476 \div 4$

$\frac{1}{4}$ of 476

$\frac{1}{4} \times 476$

0.25×476



$0.2 \times 75 = 15$

$0.2 \times 75 = \frac{1}{5} \times 75$

x by one fifth is the same as dividing by 5

$75 \div 5 = 15$

$\frac{1}{5} = \frac{2}{10}$

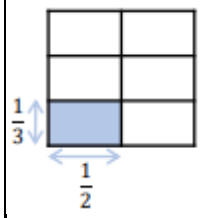
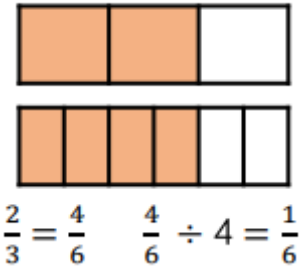
$\frac{1}{10}$ of $75 = 7.5$

$\frac{2}{10}$ of $75 = 15$

$2 \times 75 = 150$

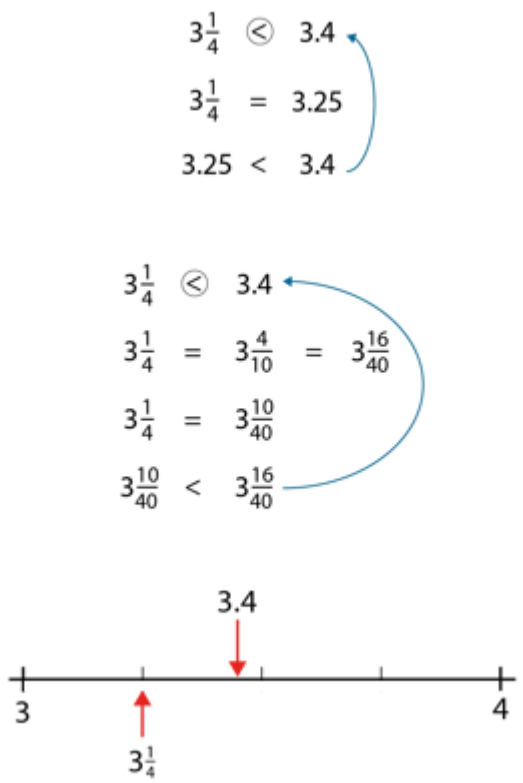
$0.2 \times 75 = 15$

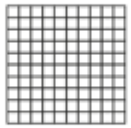
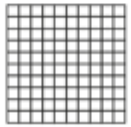
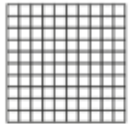
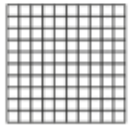
Review fractions of an amount

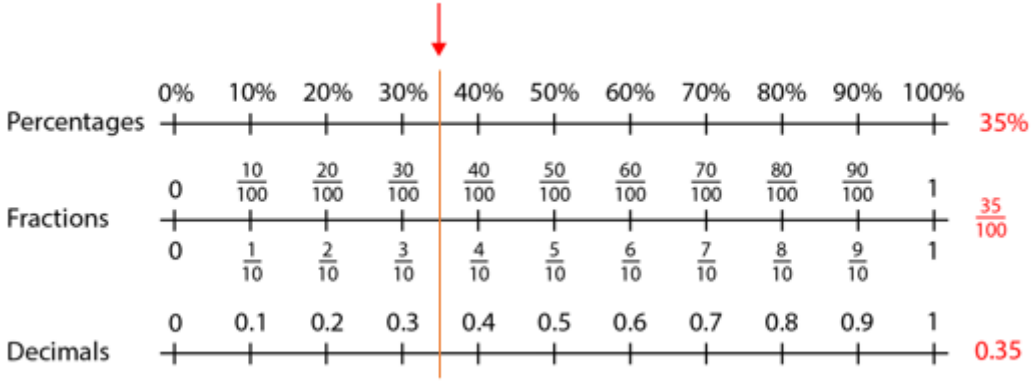
Multiple 2 sets of fractions using diagrams	1/3 x ½ = 1/6  	Folding paper to find a half of a quarter ¼ x ½ = 1/8
Divide fractions by a whole number using diagrams	1/3 ÷ 2 = 1/6 - important to note that the diagram is the same as above So is the same as 1/3 x ½ = 1/6 Also use equivalent fractions as another way to calculate 2/3 ÷ 4  	Understand why dividing a fraction by 2 is the same as multiplying by a half Also use folding paper activity in the same way ¼ ÷2 = 1/8

Spring 1	**Y6 Ratio and Proportion**

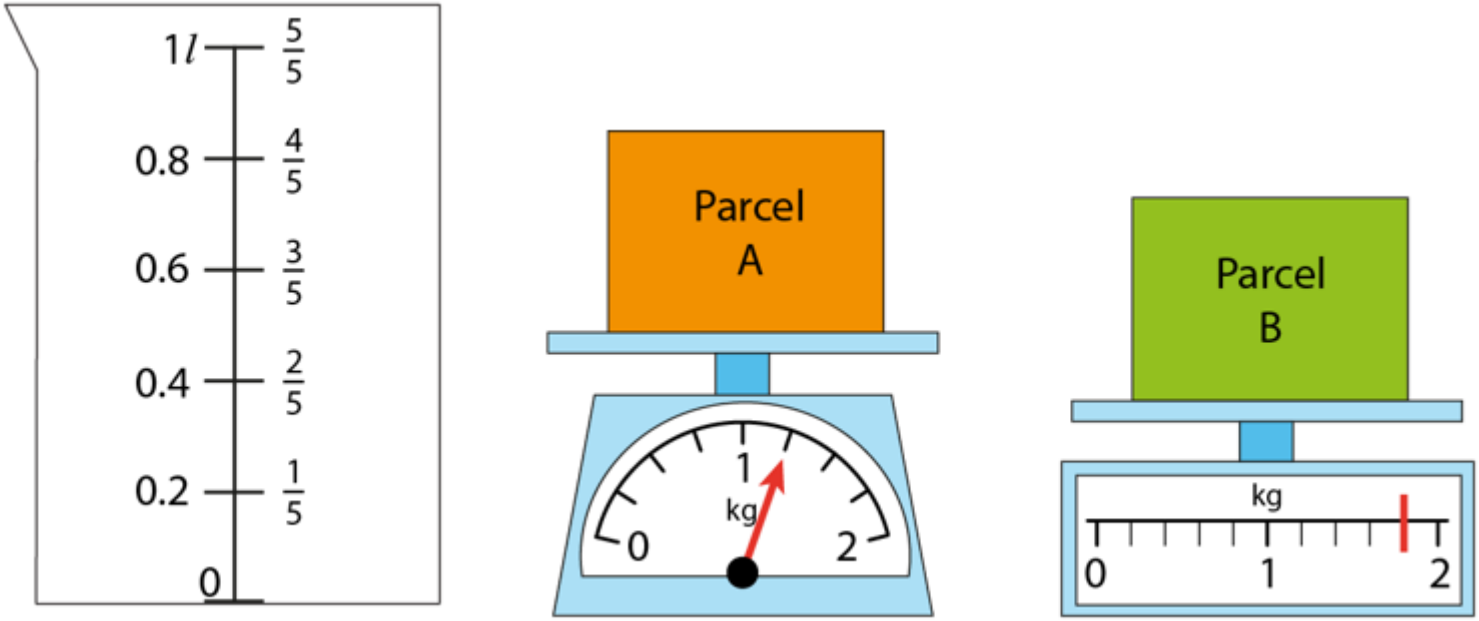
Notes	Children should have an understanding of what percentage is from Y5 and be able to recall the basic FDP equivalences (1/2 ¼ 1/5 1/10) both unit and non-unit.	
By the end of the teaching sequence children should…	Examples and models and images to use	Notes

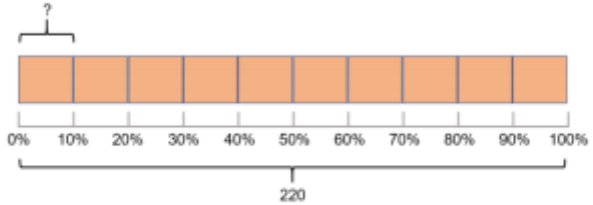
Recall and compare equivalent fractions, percentages and decimals		NCETM 3.10 is a good reference point for this unit of work on FDP. White Rose is also good for bar model images.

Percentage	Fraction	Hundred square	Number line	Decimal
80%	$\frac{\square}{100}$		0% 100%	0.80
45%	$\frac{\square}{100}$		0% 100%	0.45
31%	$\frac{\square}{100}$		0% 100%	0.31
9%	$\frac{\square}{100}$		0% 100%	0.09

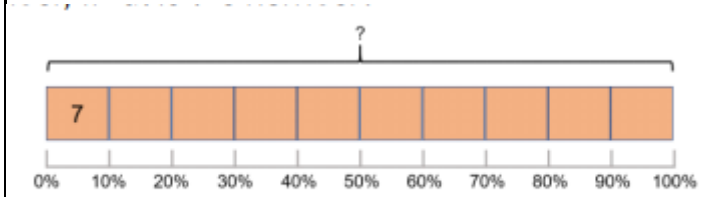
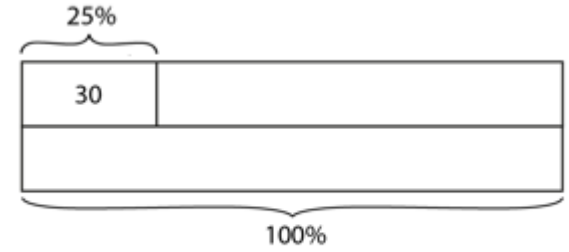
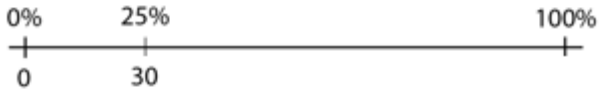
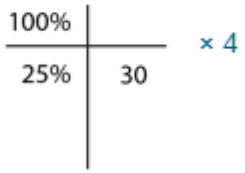


Understand fractions as division and use this to calculate decimal equivalents of fractions	¾ is 3 ÷ 4 3/8 = 0.375	Use tenths as an example of how this work 1 ÷10 = 0.1 or 1/10 of 1

Use FDP in contexts		Review measures and money

Find % of an amount	Mo uses a bar model to find 30% of 220  10% of 220 = 22 , so 30% of 220 = 3 × 22 = 66	Review fractions of an amount. Use the image of the bar model which the children are familiar

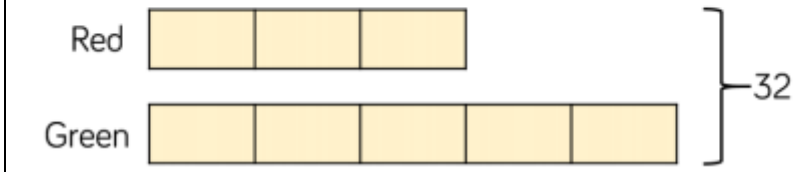
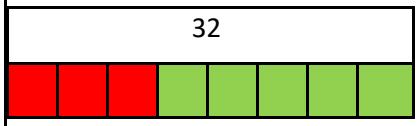
		with. Practise finding 5% by dividing 10% by 2 and 1% by dividing by 100. Find 99% by subtracting 1% etc.

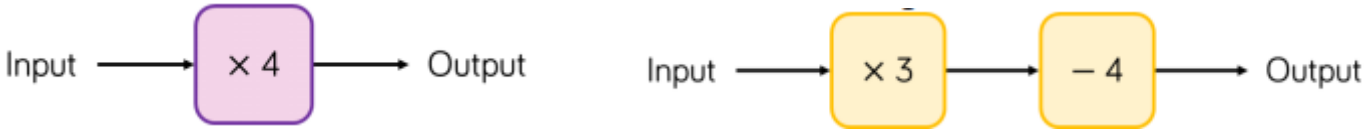
Find the whole from a %	   	If 25% of my number is 30 – how much is my whole amount.	Children should be familiar with this skill from fractions of amount. Using the fraction to find the whole.

See ratio as a relationship between 2 values	 For every two blue flowers there are ____ pink flowers. For every blue flower there are _____ pink flowers.	Use cubes/counter for concrete resources. Give children plenty of opportunity to play with this new concept and talk about the relationship between the 2 numbers
Use the ratio symbol	 The ratio of red counters to blue counters is ☐ : ☐ The ratio of blue counters to red counters is ☐ : ☐	

<table>
<tr>
<td>Show ratio in its simplest form and equivalent ratios</td>
<td>1:2 4 : 1
2 : 4 8 : 2
3: 6 16 : 4</td>
<td>Children should notice the relationship between the numbers and that the fractional amount will remain the same.</td>
</tr>
<tr>
<td>See ratio as fractions</td>
<td>
<table>
<tr><td colspan="3">1 : 2</td></tr>
<tr><td>1/3</td><td colspan="2">2/3</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>
</td>
<td>Misconception alert! Children will often see 1:2 as ½ and need to see that there are 3 parts and therefore is 1/3 and 2/3.</td>
</tr>
</table>

	This bar model shows the ratio 2 : 3 : 4 What fraction of the bar is pink? What fraction of the bar is yellow? What fraction of the bar is blue? 	Again, as above, use concrete resources and plenty of time to play.
Compare 3 quantities with ratio	Write down the ratio of: • Bananas to strawberries • Blackberries to strawberries • Strawberries to bananas to blackberries • Blackberries to strawberries to bananas	

Calculate with ratio	Eva has a packet of sweets. For every 3 red sweets there are 5 green sweets. If there are 32 sweets in the packet in total, how many of each colour are there? You can use a bar model to help you.  See the link with fractions and number of parts 	White Rose SOL and barvember has lots of ratio word problems.
	Y6 Algebra	
Notes	**Children are familiar with algebra due to missing number problems and the formulae for area and volume therefore this needn't be a big worry for children and it is the problem solving aspect that should be focussed on.**	
By the end of the teaching sequence children should…	**Examples and models and images to use**	**Notes**

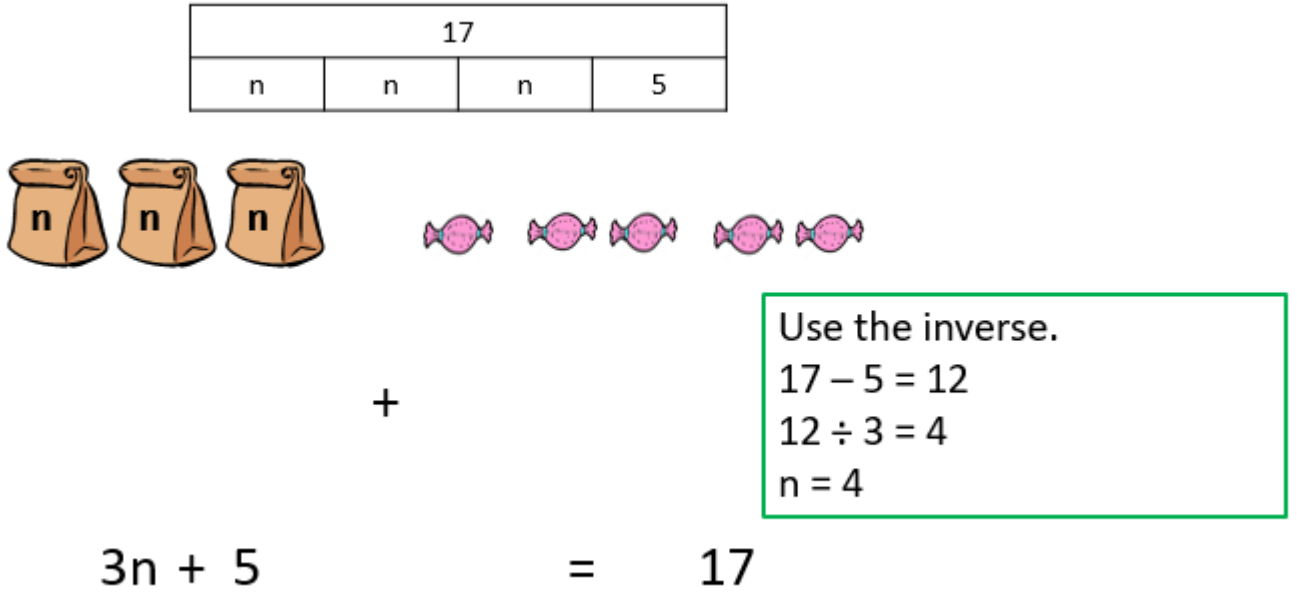
Use simple formulae	A rectangle has the area $24cm^2$. This is expressed through the equation l ×w = $24cm^2$. What could l and w stand for?	Make sure children are aware that they have already used formulae for area and volume
Generate linear sequences with algebra		White Rose has good progressi on on this

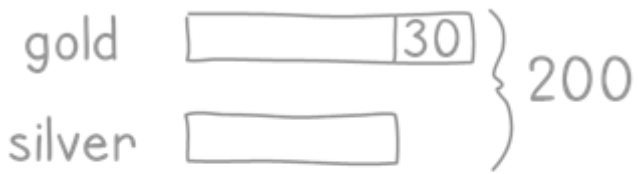
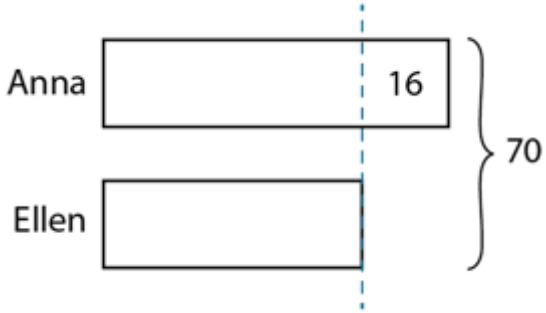
Express missing number problems algebraically	$n = 6$ 11 n | 5 $n + 5 = 11$	Link to part whole models used further down the school

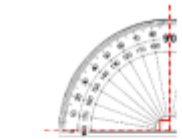
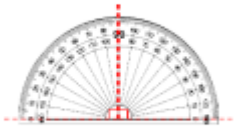
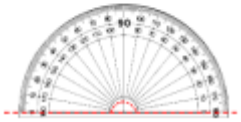
$n = 8$

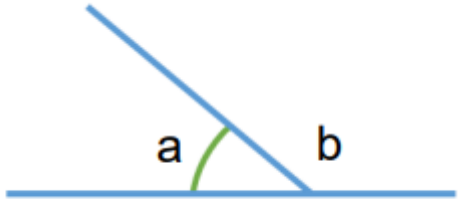
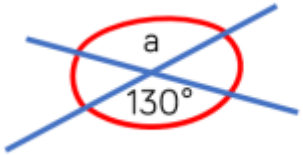
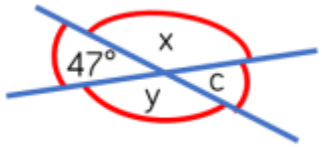
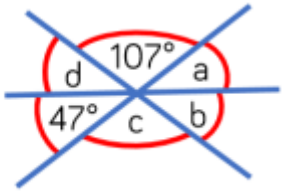
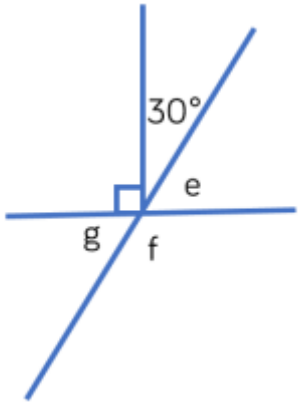
32			
n	n	n	n

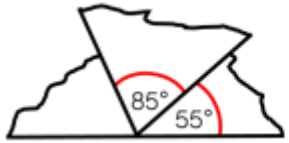
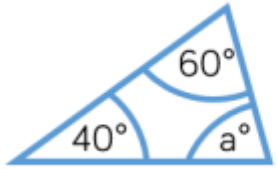
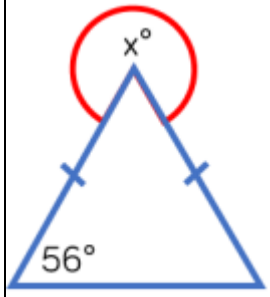
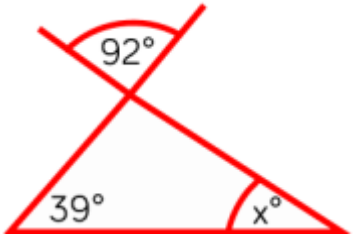
$4n = 32$

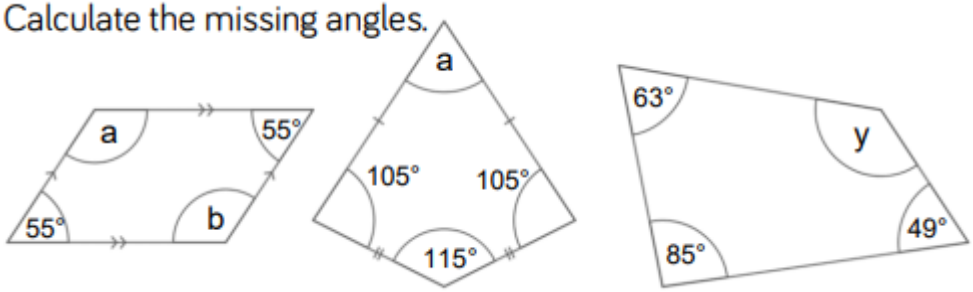
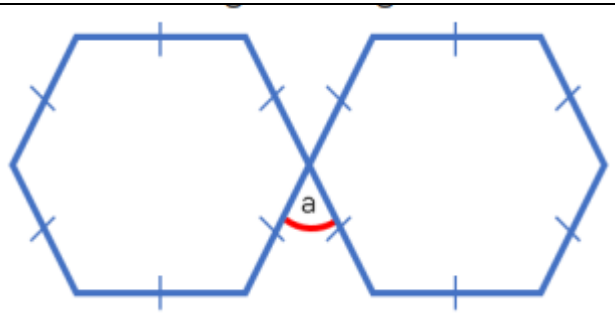
		
Solve find all possibility problems	11 a b A rectangle has the area 24cm^2. This is expressed through the equation l ×w = 24cm^2. What could l and w stand for?	NCETM 1.31
Find pairs of numbers that satisfy an equation	10 g g w *Year 6 have earnt 200 stars; the stars are either gold or silver. They have 30 more gold stars than silver. How many are gold?*	NCETM 1.31

with two unknowns	 200 − 30 = 170 170 ÷ 2 = 85 *Anna and Ellen have £70 in total. Anna has £16 more than Ellen. How much money do they each have?* 	

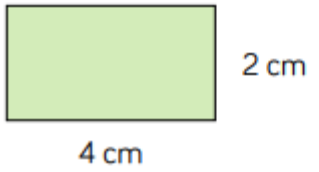
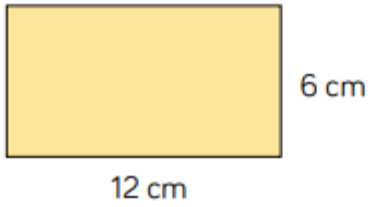
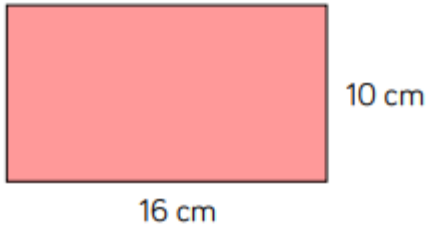
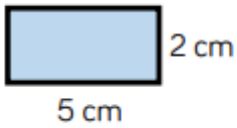
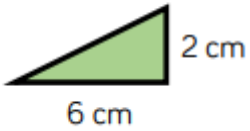
Spring 2	**Y6 Shape, angles and position**	
Notes	**Geogebra is an excellent website for showing these images and being able to show if one angle changes how the others will too** https://www.geogebra.org/?lang=en-GB White Rose is also very good for images and reasoning	
Teaching Points	**Examples and models and images to use**	**Notes**
Review angles and turns	  	**Review turns in context of compass points, diving, skating and do turns than are more than one full turn e.g. 1 ¼ turn Children should be clear on key facts 90 degrees in a right angle 4 right angles =**

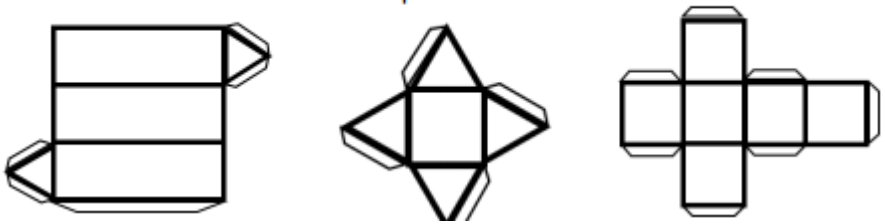
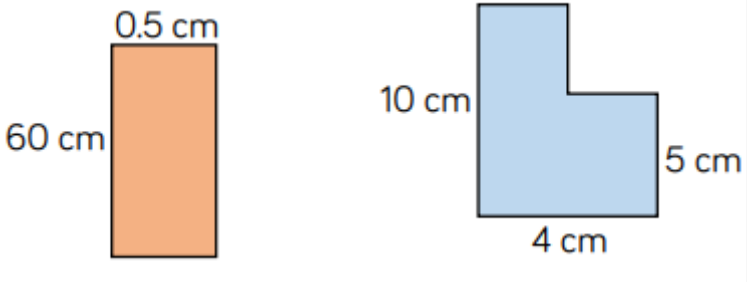
		360 degrees and a full turn. Using 9 times table
Calculate missing angles on a straight line	$a + b = \square$ $b + a = \square$ $\square - a = b$ $\square - b = a$  	**Link to algebra and part whole models Make sure the straight line isn't always vertical or horizontal**
Calculate vertically opposite angles	   	**Children should use their noticing skills to find the best way to calculate missing angels**

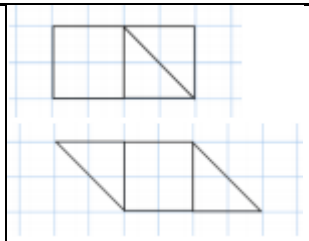
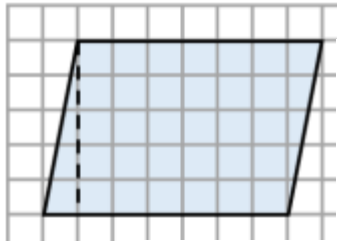
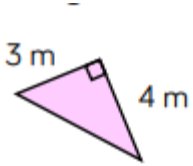
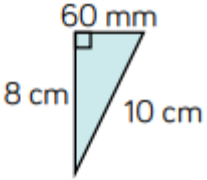
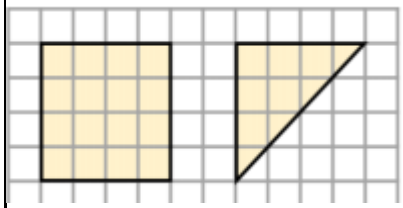
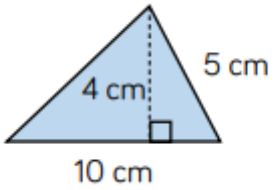
Review properties of triangles		**Make sure children are familiar with the 3 types of triangles**
Find missing angles in a triangle	   	**Make triangles out of paper and tear up corners and put angles together to show that they make 180 degrees Use different types of triangles**
Review the properties		

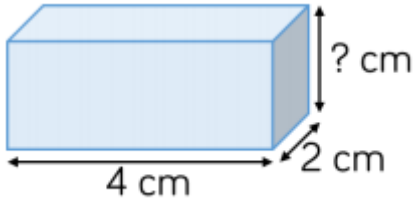
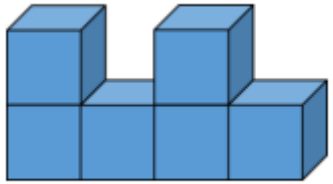
of quadrilaterals		
Find missing angles in a quadrilateral	Calculate the missing angles.  	**Remind children of the rule of verticall y opposite angles**
Review properties of 2D shapes		
Find missing angles in regular polygons	 	**Make sure children are exposed to the pattern spotting of the sum of the angles in polygons**

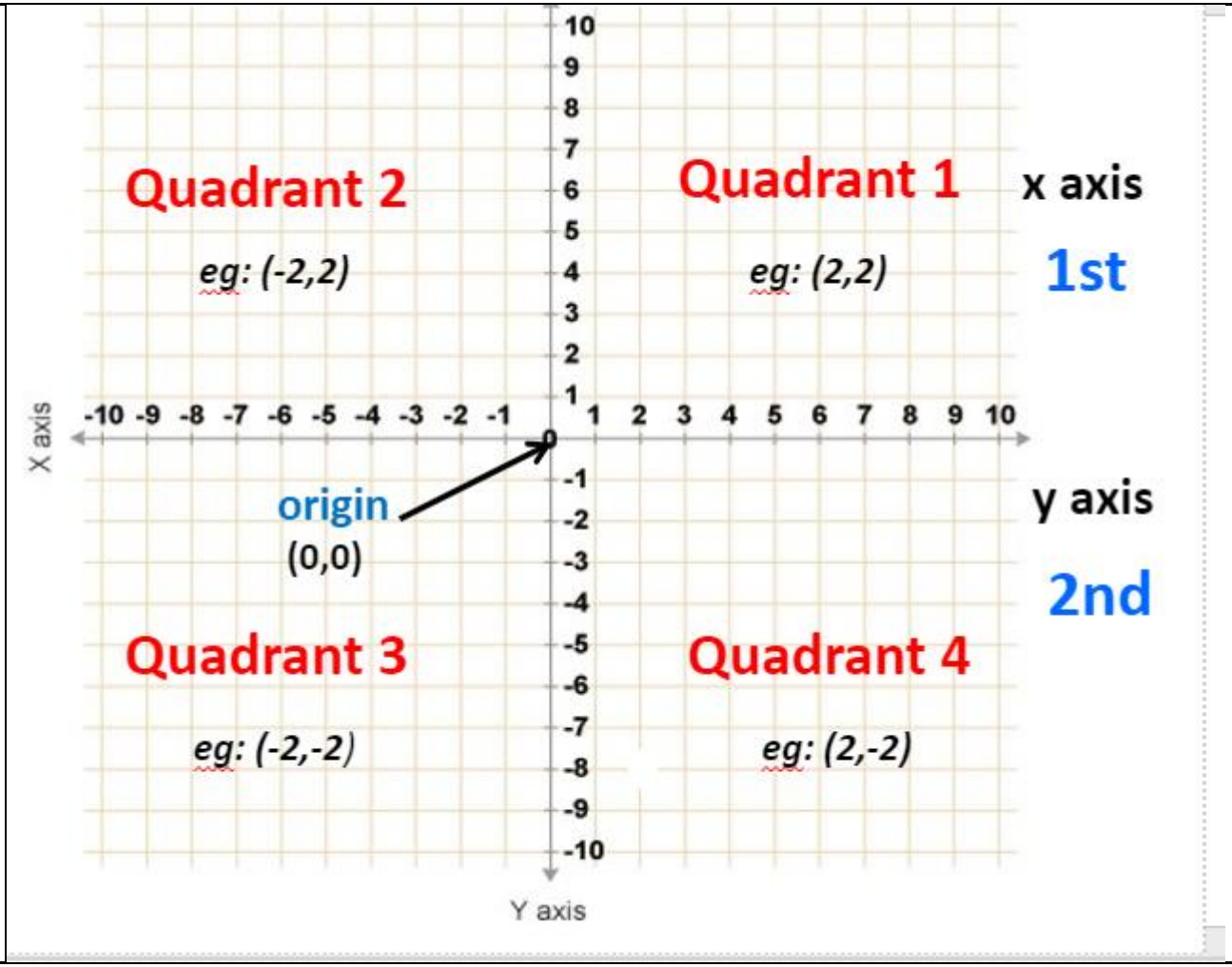
Draw regular 2d shapes accurately		**Check they can use a protractor correctly and a ruler!**

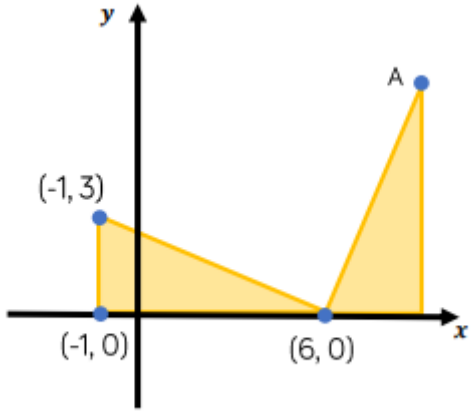
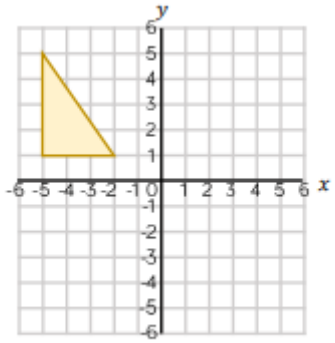
Calculate scale factors	  Enlargement has not been done in the same ratio for the pink rectangle so is not an enlargement of the green rectangle but the orange is  Enlarge these shapes by: • Scale factor 2 • Scale factor 3 • Scale factor 4  	**Children should be familiar with the language of scale factor – making something 10 times bigger linking to times tables. Also reviews ratio and gives lots of practise drawing of 2D shapes**

Draw nets of 3D shapes	What three-dimensional shape can be made from these nets? 	**Get cereal boxes etc and pull apart to see their net shape.**
Understand that shapes with the same area can have different perimeters		**Both shapes have an area of 30 cm^2. Investigate how many different sides could an area of 24 cm^2have. Review factors.**
Use formulae for area and volume		**Link to algebra**

Calculate the area of parallelograms and triangles	     	**Fold squares and rectangles into triangles to show that the area of a triangle is half. Use square paper to begin with so they can count the squares. Use right-angled triangles at first then move to the abstract formula base x height ÷2 for**

		triangles.
Calculate, estimate and compare the volume of cubes and cuboids	32 cm^3  	**Start with cubes first (could review cube numbers here). Give the volume then calculate the missing value.**

Describe positions in all 4 – quadrants		**Use laminated co-ordinates grids**

		
Translate and reflect shapes through all 4 quadrants		**Use paper 2D shapes , mirrors and a laminated co-ordinates grid for children to understand what is happening to the 2D shape.**