








MEASUREMENT: PROGRESSION MAP FOR FLUENCY, REASONING AND PROBLEM SOLVING

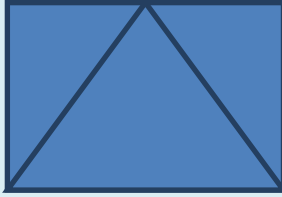
Measurement: Statutory Requirements and Reasoning (from NCETM)

COMPARING AND ESTIMATING					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
compare, describe and solve practical problems for: * lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half] * mass/weight [e.g. heavy/light, heavier than, lighter than] * capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter] * time [e.g. quicker, slower, earlier, later]	compare and order lengths, mass, volume/capacity and record the results using >, < and =		estimate, compare and calculate different measures, including money in pounds and pence (also included in Measuring)	calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm ²) and square metres (m ²) and estimate the area of irregular shapes (also included in measuring) estimate volume (e.g. using 1 cm ³ blocks to build cubes and cuboids) and capacity (e.g. using water)	calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm ³) and cubic metres (m ³), and extending to other units such as mm ³ and km ³ .
Top tips How do you know that this (object) is heavier / longer / taller than this one? Explain how you know.	Top tips Put these measurements in order starting with the smallest. 75 grammes 85 grammes 100 grammes Explain your thinking Position the symbols Place the correct symbol between the measurements > or < 36cm  63cm	Top Tips Put these measurements in order starting with the largest. Half a litre Quarter of a litre 300 ml Explain your thinking Position the symbols Place the correct symbol between the measurements > or < 306cm  Half a metre	Top Tips Put these amounts in order starting with the largest. Half of three litres Quarter of two litres 300 ml Explain your thinking Position the symbols Place the correct symbols between the measurements > or < £23.61 2326p 2623p Explain your thinking	Top Tips Put these amounts in order starting with the largest. 130000cm ² 1.2 m ² 13 m ² Explain your thinking	Top Tips Put these amounts in order starting with the largest. 100 cm ³ 1000000 mm ³ 1 m ³ Explain your thinking

	130ml  03ml Explain your thinking	930 ml  litre Explain your thinking			
sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]	compare and sequence intervals of time	compare durations of events, for example to calculate the time taken by particular events or tasks			
		estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight (appears also in Telling the Time)			
<p>Explain thinking Ask pupils to reason and make statements about to the order of daily routines in school e.g. daily timetable e.g. we go to PE after we go to lunch. Is this true or false? What do we do before break time? etc.</p>	<p>Undoing The film finishes two hours after it starts. It finishes at 4.30. What time did it start? Draw the clock at the start and the finish of the film.</p> <p>Explain thinking The time is 3:15pm. Kate says that in two hours she will be at her football game which starts at 4:15. Is Kate right? Explain why.</p>	<p>Undoing A programme lasting 45 minutes finishes at 5.20. At what time did it start? Draw the clock at the start and finish time.</p> <p>Explain thinking Salha says that 100 minutes is the same as 1 hour. Is Salha right? Explain why.</p>	<p>Undoing Imran's swimming lesson lasts 50 mins and it takes 15 mins to change and get ready for the lesson. What time does Imran need to arrive if his lesson finishes at 6.15pm?</p> <p>Explain thinking The time is 10:35 am. Jack says that the time is closer to 11:00am than to 10:00am. Is Jack right? Explain why.</p>	<p>Undoing A school play ends at 6.45pm. The play lasted 2 hours and 35 minutes. What time did it start?</p> <p>Other possibilities (links with geometry, shape and space) A cuboid is made up of 36 smaller cubes.  If the cuboid has the length of two of its sides the same what could the dimensions be? Convince me</p>	<p>Undoing A film lasting 200 minutes finished at 17:45. At what time did it start?</p> <p>Other possibilities (links with geometry, shape and space) A cuboid has a volume between 200 and 250 cm cubed. Each edge is at least 4cm long. List four possibilities for the dimensions of the cuboid..</p>

MEASURING and CALCULATING					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
measure and begin to record the following: * lengths and heights * mass/weight * capacity and volume * time (hours, minutes, seconds)	choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels	measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)	estimate, compare and calculate different measures , including money in pounds and pence (appears also in Comparing)	use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling.	solve problems involving the calculation and conversion of units of measure , using decimal notation up to three decimal places where appropriate (appears also in Converting)
Application (Can be practical) Which two pieces of string are the same length as this book?	Application (Practical) Draw two lines whose lengths differ by 4cm.	Write more statements (You may choose to consider this practically) If there are 630ml of water in a jug. How much water do you need to add to end up with a litre of water? What if there was 450 ml to start with? Make up some more questions like this	Write more statements One battery weighs the same as 60 paperclips; One pencil sharpener weighs the same as 20 paperclips. Write down some more things you know. How many pencil sharpeners weigh the same as a battery?	Write more statements Mr Smith needs to fill buckets of water. A large bucket holds 6 litres and a small bucket holds 4 litres. If a jug holds 250 ml and a bottle holds 500 ml suggest some ways of using the jug and bottle to fill the buckets.	Write more statements Chen, Megan and Sam have parcels. Megan's parcel weighs 1.2kg and Chen's parcel is 1500g and Sam's parcel is half the weight of Megan's parcel. Write down some other statements about the parcels. How much heavier is Megan's parcel than Chen's parcel?
		measure the perimeter of simple 2-D shapes	measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres	measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres	recognise that shapes with the same areas can have different perimeters and vice versa
		Testing conditions A square has sides of a whole number of centimetres. Which of the following measurements could represent its	Testing conditions If the width of a rectangle is 3 metres less than the length and the perimeter is between 20 and 30 metres, what could the dimensions of the rectangle be?	Testing conditions Shape A is a rectangle that is 4m long and 3m wide. Shape B is a square with sides 3m. The rectangles and squares are put together side by	Testing conditions A square has the perimeter of 12 cm. When 4 squares are put together, the perimeter of the new shape can be calculated. For example:

		perimeter? 8cm 18cm 24cm 25cm	Convince me.	side to make a path which has perimeter between 20 and 30 m. For example  Can you draw some other arrangements where the perimeter is between 20 and 30 metres?	 What arrangements will give the maximum perimeter?
recognise and know the value of different denominations of coins and notes	recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value find different combinations of coins that equal the same amounts of money solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change	add and subtract amounts of money to give change, using both £ and p in practical contexts			
Possibilities Ella has two silver coins. How much money might she have?	Possibilities How many different ways can you make 63p using only 20p, 10p and 1p coins?	Possibilities I bought a book which cost between £9 and £10 and I paid with a ten pound note. My change was between 50p and £1 and was all in silver coins. What price could I have paid?	Possibilities Adult tickets cost £8 and Children's tickets cost £4. How many adult and children's tickets could I buy for £100 exactly? Can you find more than one way of doing this?		

			<p>find the area of rectilinear shapes by counting squares</p>	<p>calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes</p> <p><i>recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³) (copied from Multiplication and Division)</i></p>	<p>calculate the area of parallelograms and triangles</p> <p>calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [e.g. mm³ and km³].</p> <p>recognise when it is possible to use formulae for area and volume of shapes</p>
			<p>Always, sometimes, never If you double the area of a rectangle, you double the perimeter.</p> <p><i>See also Geometry Properties of Shape</i></p>	<p>Always, sometimes, never When you cut off a piece of a shape you reduce its area and perimeter.</p> <p><i>See also Geometry Properties of Shape</i></p>	<p>Always, sometimes, never The area of a triangle is half the area of the rectangle that encloses it:</p>  <p><i>See also Geometry Properties of Shape</i></p>

TELLING THE TIME					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.	tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times.	tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks	read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting)		
recognise and use language relating to dates, including days of the week, weeks, months and years	know the number of minutes in an hour and the number of hours in a day. (appears also in Converting)	estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight (appears also in Comparing and Estimating)			
			solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Converting)	solve problems involving converting between units of time	
	Working backwards Draw hands on the clock faces to show when break started and when it finished 15 minutes later at 10:35.	Working backwards Tom's bus journey takes half an hour. He arrives at his destination at 9:25. At what time did his bus leave? 9:05 8:55 8:45	Working backwards Put these times of the day in order, starting with the earliest time. A: Quarter to four in the afternoon B: 07:56 C: six minutes to nine in the evening D: 14:36	Working backwards Put these lengths of time in order starting with the longest time. 105 minutes 1 hour 51 minutes 6360 seconds	

CONVERTING					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	know the number of minutes in an hour and the number of hours in a day. (appears also in Telling the Time)	know the number of seconds in a minute and the number of days in each month, year and leap year	convert between different units of measure (e.g. kilometre to metre; hour to minute)	convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)	use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places
			solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Telling the Time)	solve problems involving converting between units of time	solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate (appears also in Measuring and Calculating)
			read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting)	understand and use equivalences between metric units and common imperial units such as inches, pounds and pints	convert between miles and kilometres
	<p>The answer is</p> <p>3 hours What is the question?</p> <p>What do you notice?</p> <p>What do you notice? 1 hour = 60 minutes $\frac{1}{2}$ hour = 30 minutes $\frac{1}{4}$ hour = 15 minutes</p> <p>Write down some more time facts like these</p>	<p>The answer is</p> <p>25 minutes What is the question?</p> <p>What do you notice?</p> <p>What do you notice? 1 minute = 60 seconds 2 minutes = 120 seconds Continue the pattern</p> <p>Write down some more time facts like these</p>	<p>The answer is</p> <p>225 metres What is the question?</p> <p>What do you notice?</p> <p>What do you notice? 1:00pm = 13:00 2:00pm = 14:00</p> <p>Continue the pattern</p>	<p>The answer is</p> <p>0.3km What is the question?</p> <p>What do you notice?What do you notice? 1 minute = 60 seconds 60 minutes = <input type="text"/> seconds</p> <p>Fill in the missing number of seconds down some more time facts like this.</p>	<p>The answer is</p> <p>24 metres cubed What is the question?</p> <p>What do you notice?8 km = 5 miles 16km = <input type="text"/> miles 4 km = <input type="text"/> miles</p> <p>Fill in the missing number of miles. Write down some more facts connecting kilometres and miles.</p>

Measurement: Key Performance Indicators

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Recognise and know the value of different denominations of coins and notes</p> <p>Sequence events in chronological order using language</p> <p>Recognise and use language relating to dates, including days of the week, weeks, months and years</p> <p>Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times</p>	<p>Combine amounts of money to make a value, including using £ and p symbols</p> <p>Tell the time to the nearest 5 minutes, including drawing clocks</p>	<p>Measure, compare and calculate measures using standard units</p> <p>Measure the perimeter of simple 2-D shapes</p> <p>Add and subtract money, including giving change</p> <p>Tell and write the time from an analogue clock, including using Roman numerals</p> <p>Estimate and read time to the nearest minute</p>	<p>Convert between different units of metric measurement, including money</p> <p>Find the area of rectilinear shapes by counting squares</p> <p>Solve problems converting units of time</p>	<p>Measure and calculate the perimeter of composite rectilinear shapes</p> <p>Calculate the area of rectangles, and estimate the area of irregular shapes</p> <p>Use the properties of rectangles to find missing lengths and angles</p>	<p>Convert units of measure between smaller and larger units</p> <p>Convert between miles and kilometres</p> <p>Calculate the area of parallelograms and triangles</p> <p>Calculate and compare volume of cubes and cuboids</p>

Measurement: Cross-curricular links

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Science - Make observations and compare the seasons. Know which months are in the seasons.</p> <p>Science investigation - Are older people always taller people?</p> <p>Science investigation - Use of rulers to measure the height of beanstalk</p> <p>History - Place events on a time line.</p> <p>PE - During World Maths Day time how many activities you can do in a minute.</p>	<p>Christmas crafts - measuring strips of paper for decorations</p> <p>DT Weighing ingredients for bread making English - paying for stamps English - ordering events in a story</p> <p>Science measuring cress, handspans</p>	<p>Measurements of Whales.</p> <p>Looking at pyramids, measuring heights (Egyptians)</p> <p>Mass - Weights of rocks (Science)</p> <p>Time - Periods of time (History)</p> <p>Rocks (Science)</p> <p>Measuring times (P.E.)</p>	<p>Shaduf construction in DT - volume and distance</p>	<p>Understand and use common approximate conversions between metric and imperial (WW2 rationing).</p> <p>Design a menu based on rationing for a family of 4. How much would each family member get?</p> <p>Design an air raid shelter. How big would it be? How many sand bags would be needed? What items would fit inside the room?</p> <p>Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes (designing an air raid shelter).</p>	

Measurement: Vocabulary

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Measurement	Measuring scale	Measurement	Measure	unit	centimetre
Guess	Length	Compare	measurement	standard unit	metre
Estimate	Height	Estimate	size	metric unit	kilometre
Roughly	Width	Approximately	compare	imperial unit	millimetre
Centimetre	Depth	centimetre	unit	centimetre	mile
Metre	Further	metre	standard unit	metre	yard
Length	Furthest	kilometre	metric unit	kilometre	foot
Height	Ruler	millimetre	measuring scale	millimetre	feet
Width	Metre stick	Length	estimate	length	inch
Depth	Tape measure	Height	centimetre	height	inches
Wide	Kilogram half kilogram	Width	metre	width	length
Narrow	Weigh	Depth	kilometre	depth	height
Longer/shorter	Weighs	Longest	length	breadth	width
Taller/higher	Balances	Shortest	height	perimeter	depth
Longest/shortest	Litre/half litre/millilitres	Tallest	width	area	breadth
Tallest/highest	Capacity	Highest	depth	square centimetres	perimeter
Ruler	Contains	Distance apart	breadth	square metres	circumference
Metre stick	Temperature	Between...to...from	perimeter	square millimetres	area
Kilogram half kilogram	Degree	Perimeter	area	mass	square centimetre (cm ²)
Heavier than	Fortnight	Metre stick	square centimetre	weight	square metre (m ²)
Lighter than	Quarter past	Tape measure	ruler	kilogram	square millimetre (mm ²)
Heaviest/lightest	Quarter to	Kilogram half kilogram	metre stick	half kilogram	tonne
Litre/half litre	5 10 15 .. minutes past	Weigh	tape measure	gram	kilogram
Capacity	Digital	Weighs	mass: big, small	litre	half kilogram
Volume	Analogue	Litre	weight: heavy, light	half litre	gram
More than	Clock/watch	Half litre	kilogram	millilitre	pound
Less than	Timer/seconds	millilitre	gram	capacity	ounce
Half full		capacity	weigh	pint	litre
Quarter full		volume	balances	gallon	half litre
Days of the week		Heaviest	scales	calendar	millilitre
Months of the year		Lightest	litre	date	centilitre
Seasons		Scales	millilitre	date of birth	cubic centimetres (cm ³)
Birthday		More than	capacity	digital	cubic metres (m ³)
Morning		Less than	volume	analogue	
Afternoon		Months of the year	measuring cylinder	clock/watch	cubic kilometres (km ³)

<p>Evening Night Earlier Later Next First Last Midnight Hour oclock Half past Quarter past Quarter to Penny Pence Pound Change Dear Costs more Cheaps Costs less Cheaper Costs the same as How much How many change</p>		<p>Seasons Days/weeks/weekend Fortnight/months/years Century Calendar Earliest Latest Always Never Often Sometimes Oclock/half past Quarter past/quarter to 5..10..15 minutes past a.m p.m roman numerals 12 hour clock time 24 hour clock time Coin Penny Pence Pound Change How much How many total</p>	<p>temperature degree centigrade time century noon midnight calendar date of birth a.m p.m digital analogue timetable arrive depart money coin pence pound buy sell pay change total</p>	<p>timer timetable arrive depart roman numerals 12 hour clock time 24 hour clock time Discount currency</p>	<p>cubic millimetres (mm³) capacity volume degree timetable arrive depart Greenwich Mean Time British Summer Time International Date Line Profit Loss</p>
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