St John's CE Primary School

Progression in Skills and Vocabulary with Associated Reasoning

EYFS-Y6

Measurement (includes Ready to Progress Criteria)

Completed March 2023

Vocabulary Progression

The following section of this document lists mathematical vocabulary and phrases that children are required to understand and use as they move through the school for this strand of Mathematics. It is based on the published 2014 national curriculum, NCETM guidance and White Rose Maths. It lists the new vocabulary in the year in which it should be explicitly used and taught. Vocabulary from previous year group should be referred to in addition to that for each year group. It is designed to assist with the teaching of vocabulary across EYFS, KS1 and KS2 and is aligned with the White Rose schemes of learning. This document identifies in which year group vocabulary should be explicitly taught and introduced. However, language should be revisited in subsequent year groups to ensure children are consolidating their understanding. This document is fully editable so language can be moved into earlier or later year groups where necessary in line with latest research findings and subject association (NCETM) updates. Some vocabulary might be introduced earlier (shapes for instance) if necessary or as part of an activity, however this document ensures coverage is progressive. It is expected that key vocabulary is displayed on 'Maths Learning Walls' at appropriate times during the academic year and in line with the current topic area being taught within the class and is promoted through mathematical talk in lessons.

Vocabulary Progression							
Place Value							
EYFS		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Nursery	Reception						
Measure Size Weight Capacity Long Short Length Large Small First Then Before After Day Evening Morning Afternoon Today Yesterday Tomorrow Night time Earlier Later Day	Measure Wide(er) Narrow (er) Compare Long (er) (est) Short (er) (est) Length Time Quicker Slower Earlier Later Next Week Hour Minute	**TIME** Year Month Week Weekend Day Days of the week Months of the year Night Hour Minute Second Morning Afternoon Evening Yesterday Today / Tomorrow Before After Old(er) / New(er) Clock (face) o'clock Half past Birthday Watch Hour (hand) Minute (hand) Minutes past/to Quarter past/to Half past/to	**TIME** Analogue Five/ten/ 1/4 past/to Clockwise Anticlockwise **MASS** Gram Kilogram **LENGTH** Height Width Metre Centimetre Millimetre **CAPACITY / VOLUME** Litre Millilitre **TEMPERATURE** Degrees Celsius Thermometer **MONEY** Price Cost Amount Change	Convert **LENGTH** Perimeter Millimetre Kilometre (km) **TIME** Roman numerals to XII AM / PM Duration Noon Midnight Analogue clock Digital clock 12-hour clock 24-hour clock	Convert Conversion Area Rectilinear Dimensions Kilometre 24-hour clock	Composite Metric Imperial Inch Foot Yard Mile cm2 cm3 m2 m3 Pound Pint	mm3 km3 Speed Mph m/s km/h

		Fast(er) Quick(er) Slow(er) Early Earlier Late Later **MASS** Weigh Weight Heavy Heavier (than) Heaviest Light Lighter (than) Lightest Balance (weighing) scales Gram (g) Kilogram (kg) **LENGTH** Length Long (er) (est) Short (er) (est) Ruler Centimetre(cm) Metre (m) Far Distance Measure **CAPACITY / VOLUME** Full Empty More than Less than Half full **MONEY** Coin note amount Penny/pound/£ Coin values: One pence Two pence Five pence Ten pence Twenty pence Fifty pence					

Skills & Reasoning Progression

The following section of this document lists mathematical skills that children should become fluent and proficient in their knowledge, understanding and application. It also includes examples of reasoning questions that could be used by teachers to encourage pupils to apply their knowledge and to reason their understanding in order to build a deeper, more complex understanding of different mathematical concepts beyond 'rote' learning or superficial understanding. It is based on the published 2014 national curriculum, NCETM guidance and White Rose Maths. It lists the new concepts that need to be taught in each year group and is aligned and arranged in order to support teachers to understand the previous step in a particular concept and also the next step (where the children have come from and should be secure with, and how this will then be applied in future year groups). This is <u>not</u> done to enable teachers to 'move children on' to the next year group step, hence the exemplification of reasoning questions to support teaching staff to deliver a 'depth, not breadth' approach. However, preceding steps can be used to aid the delivery of intervention support if children are not secure with the previous step of learning – this is also supported by the demarcation of 'Ready to Progress Criteria'. These are criteria that pupils must be secure with from their previous year group in order to allow them to master new content in their current year group. Links to NRich activities are also provided to enable teaching staff to link in Mathematical investigation where possible.

Skill Progression							
Measures – Using Measures							
EYFS		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
3-4year olds	Reception						
Make comparisons between objects relating to size, length, weight and capacity.	Compare length, weight and capacity.	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 =	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	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

		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				
					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
						Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints	Convert between miles and kilometres
Reasoning Progression - Examples							
		Top Tips How do you know that this (object) is heavier / longer / taller than this one?	**Top tips** Put these measurements in order starting with the smallest.	**Top Tips** Put these measurements in order starting with the largest.	**Top Tips** Put these amounts in order starting with the largest. Half of three litres	**Top Tips** Put these amounts in order starting with the largest. 130000cm²	**Top Tips** Put these amounts in order starting with the largest. 100 cm³ 1000000 mm³

		Explain how you know.	75 grams 85 grams 100 grams Explain your thinking **Position the symbols** Place the correct symbol between the measurements > or < 36cm ☐ 63cm 130ml ☐ 103ml Explain your thinking.	a)Half a litre b)Quarter of a litre c) 300 ml Explain your thinking **Position the symbols** Place the correct symbol between the measurements > or < 306cm ☐ Half a metre 930 ml ☐ 1 litre Explain your thinking.	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	1.2 m^2 13 m^2 Explain your thinking	1 m^3 Explain your thinking **The answer is ….** 24 metres cubed **What is the question?** What do you notice? 8 km = 5 miles 16km = ____ miles 4 km = ____miles Fill in the missing number of miles. Write down some more facts connecting kilometres and miles.

Measures - Money							
EYFS		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
3-4year olds	Reception						
		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	Add and subtract amounts of money to give change, using both £ and p in practical contexts	Estimate, compare and calculate different measures, **including money in pounds and pence**	Use all four operations to solve problems involving measure (e.g. length, mass, volume, **money**)	
			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				
Reasoning Examples – Money							
		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?		

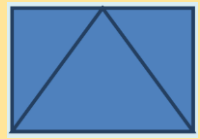
Measures - Time							
EYFS		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
3-4yr Olds	Reception						
Begin to describe a sequence of events, real or fictional, using words, such as 'first', 'then…'		Sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, 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			
		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		
		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.	Know the number of seconds in a minute and the number of days in each month, year and leap year			
				Estimate and read time with increasing accuracy to the nearest minute; record and	Solve problems involving converting from hours to minutes; minutes to seconds; years to	Solve problems involving converting between units of time	Use, read, write and convert between standard units, converting measurements of

				compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight	months; weeks to days		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 **WRMaths time conversions covered in Y5.*
Reasoning Examples – Rounding							
		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.	**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. **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.	**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 **Explain thinking** Salha says that 100 minutes is the same as 1 hour. Is Salha right? Explain why.	**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? **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.	**Undoing** A school play ends at 6.45pm. The play lasted 2 hours and 35 minutes. What time did it start?	**Undoing** A film lasting 200 minutes finished at 17:45. At what time did it start?

			Working backwards Draw hands on the clock faces to show when break started and when it finished 15 minutes later at 10:35. **The answer is ….** 3 hours What is the question? **What do you notice?** What do you notice? 1 hour = 60 minutes ½ hour = 30 minutes ¼ hour = 15 minutes Write down some more time facts like these.	**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 **The answer is ….** 25 minutes What is the question? **What do you notice?** What do you notice? 1 minute = 60 seconds 2 minutes = 120 seconds Continue the pattern / Write down some more time facts like these.	**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 The answer is …. 225 metres What is the question? **What do you notice?** What do you notice? 1:00pm = 13:00 2:00pm = 14:00 Continue the pattern.	**Working backwards** Put these lengths of time in order starting with the longest time. a)105 minutes b)1 hour 51 minutes c) 6360 seconds The answer is …. 0.3km What is the question? **What do you notice?** What do you notice? 1 minute = 60 seconds 60 minutes = ___ seconds Fill in the missing number of seconds down some more time facts like this.	

Measures – Perimeter, Area and Volume							
EYFS		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
3-4yr Olds	Reception						
				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
					Find the area of rectilinear shapes by counting squares	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 *(recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})* (copied from Multiplication and Division)	Calculate the area of parallelograms and triangles
							Recognise when it is possible to use formulae for area and volume of shapes
						Estimate volume (e.g. using 1cm^3 blocks to build	Calculate, estimate and compare volume

						cubes and cuboids) and capacity (e.g. using water)	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.
Reasoning Examples - Perimeter							
				Testing conditions A square has sides of a whole number of centimetres. Which of the following measurements could represent its perimeter?8cm 18cm 24cm 25cm	**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 lobe? Convince me.	**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 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?	**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:  What arrangements will give the maximum perimeter?
Reasoning Examples - Area							
					Always, sometimes, never If you double the area of a rectangle, you	**Always, sometimes, never** When you cut off a piece of a shape you reduce its area	**Always, sometimes, never** The area of a triangle is half the area of the

					double the perimeter. See also Geometry Properties of Shape	and perimeter. See also Geometry Properties of Shape	rectangle that encloses it: 
Reasoning Examples – Volume							
		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 450ml 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.