Area of Maths = Measurement

Definition: "*Use of standard units to determine size or quantity in regard to length, breadth, height, area, mass or weight, volume, fluid volume, capacity, temperature and time.*"

From Jenny Eather's A Maths Dictionary for Kids
http://www.amathsdictionaryforkids.com

Metric Vocabulary:

Length / Height

Millimetre (mm), Centimetre (cm), Metre (m), Kilometre (km)

Area

Square centimetre (cm^2), Square metre (m^2)

Volume

Cubic centimetre (cm^3), Cubic metre (m^3)

Mass / Weight

Milligram (mg), Gram (g), Kilogram (kg), Tonne (t)

Capacity

Millilitre (ml), Litre (l)

Temperature

Celsius (°C)

Time

Second, Minute, Hour, Day, Week, Month, Year, Decade, Century

Metric Conversions:

Length / Height

10 millimetres = 1 centimetre, cm
100 centimetres = 1 metre, m
1000 metres = 1 kilometre, km

Mass / Weight

1000 milligrams = 1 gram, g
1000 grams = 1 kilogram, kg
1000 kilograms = 1 tonne, t

Capacity

1000 millilitres = 1 litre, l or L

Time

1 minute = 60 seconds
60 minutes = 1 hour
1 day = 24 hours
7 days = 1 week
1 Year = 12 months ≈ 52 weeks
1 Year = 365 days (366 in a leap year)
1 Decade = 10 years
1 Century = 10 decades = 100 years.

Imperial Vocabulary:

Length / Height

Inch, Foot, Yard, Mile

Mass / Weight

Ounce, Pound, Stone

Capacity

Pint, Gallon

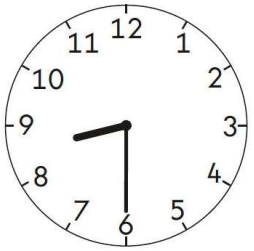
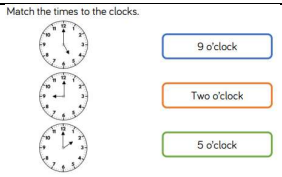
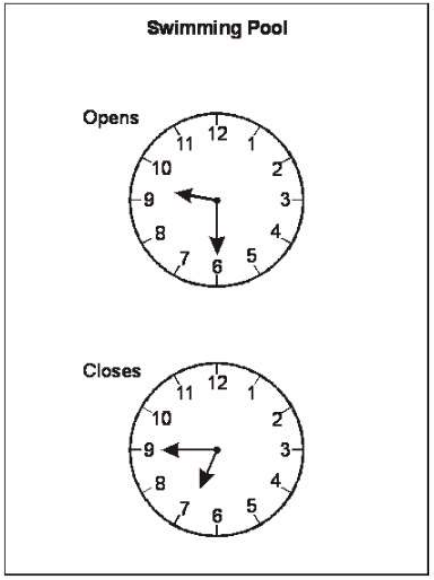
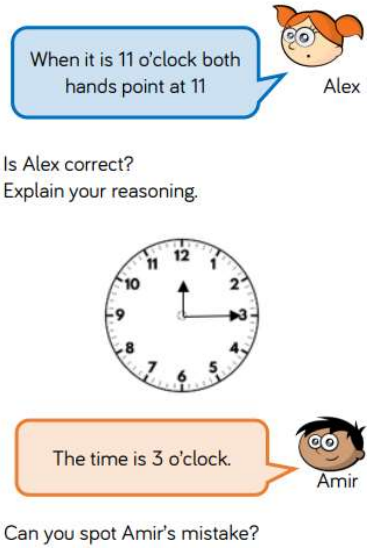
Imperial to metric approximations

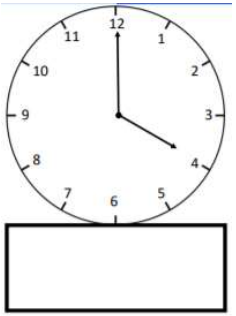
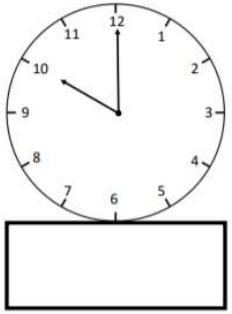
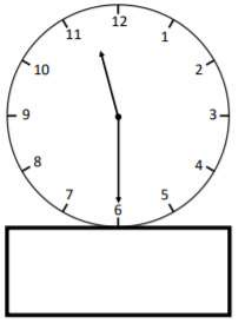
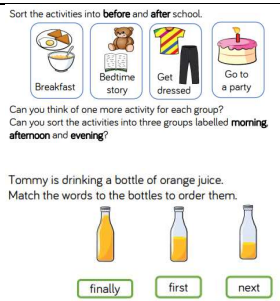
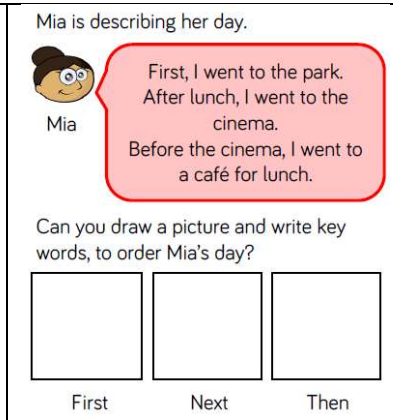
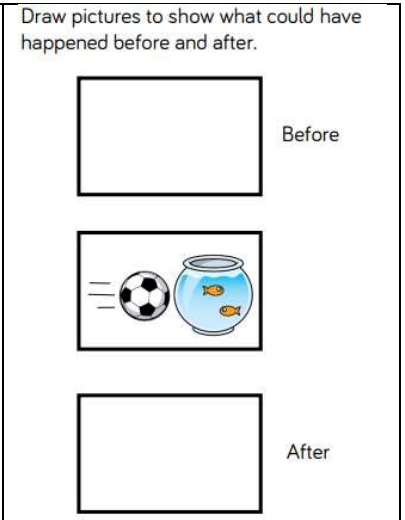
Imperial unit	Metric
1 inch	≈ 2.5cm
1 foot	≈ 30cm
1 yard	≈ 91cm
1 mile	≈ 1.6 kilometres
1 ounce	≈ 28 grams
1 pound	≈ 454 grams
1 stone	≈ 6.4 kilograms
1 pint	≈ 568 ml
1 gallon	≈ 4.5 litres

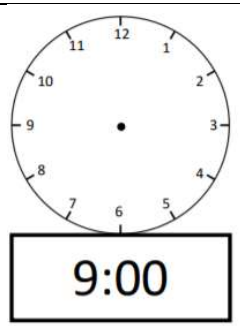
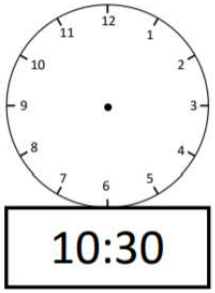
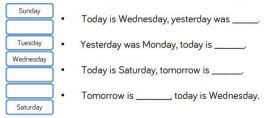
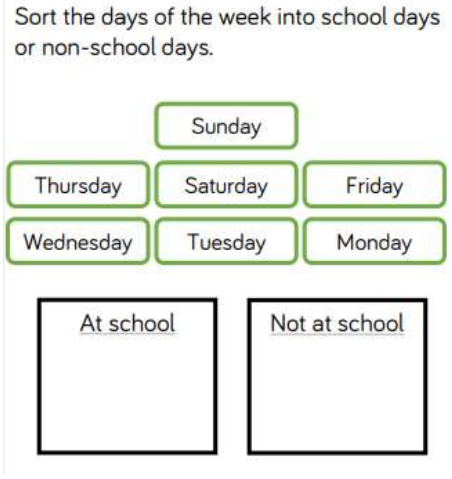
Declarative knowledge

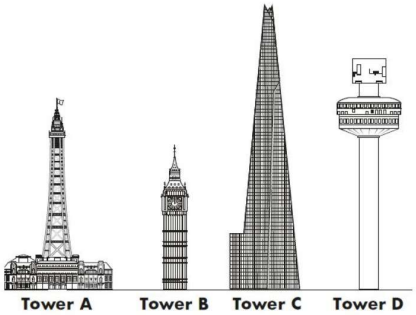
Measurements	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Automatically recall… **Blue highlight = Roche's Specific Expectations** **Red font = Roche's Priorities for Revisiting**	What the day is today, what it was yesterday and what it'll be tomorrow.	Value of monetary coins and notes on sight. Recall days of the week and months of the year. **The time in o'clock and half-hour intervals.**	**Units of measure for length / height (cm/m), weight (g/Kg), capacity (ml/l) and temperature (°C).** The symbols of pounds (£) and pence(p). Know the number of minutes in an hour and the number of hours in a day. **The time in 5 minute intervals.**	How to find the perimeter of simple 2D shapes. The number of seconds in a minute and the **number of days in each month, year and leap year.** **Read time to the nearest minute.** Roman Numerals to XII.	**1cm = 10mm** **1m = 100cm** **1m = 1,000mm** **1km = 1,000m** **1kg = 1,000g** **1l = 1,000ml** 24 hour equivalent of a 12 hour time.	Formula for finding the perimeter and area of squares and rectangles.	Formula for the area of a parallelogram. Formula for the area of a triangle. Formula for the volume of a cuboid (including cubes).

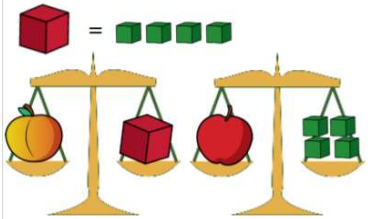
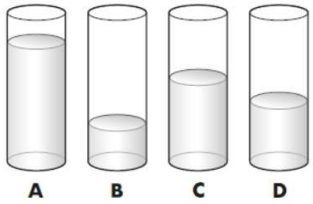
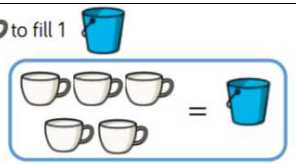
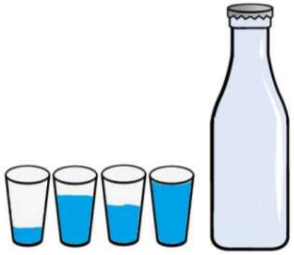
Year 1

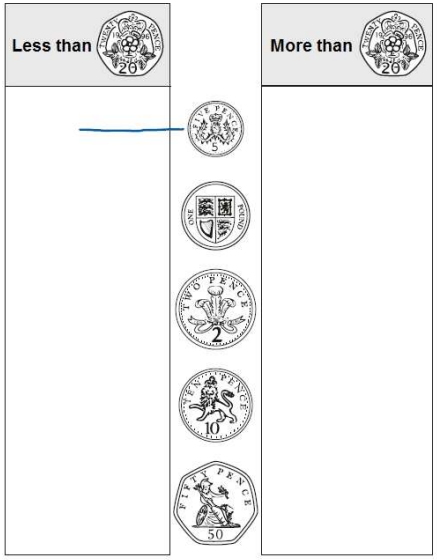
Year group:	NC L.O.	Practical	Pictorial	Abstract	Problem Solving	Reasoning
		Make it! **SAY IT**	**Show it/Draw it!** **SAY IT**	**Read/Write it!** **SAY IT**		
1	Measure and begin to record time (hours, minutes, seconds). Compare, describe and solve practical problems for time [for example, quicker, slower, earlier, later].	Clocks Watches Stopwatches	Images of clockfaces: 		 At what time does the pool open?	

1	Sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]. Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.		Write down the times shown on the clocks:    Draw the times shown on these clocks:			

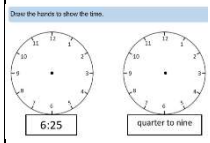
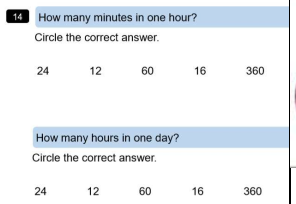
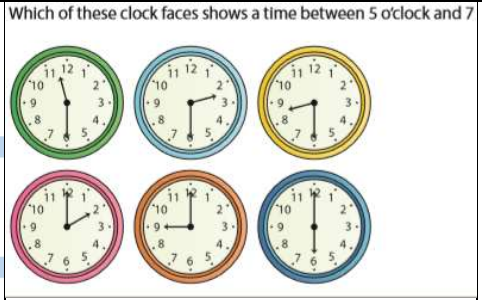
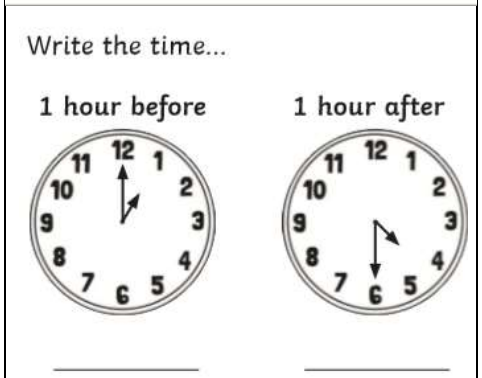
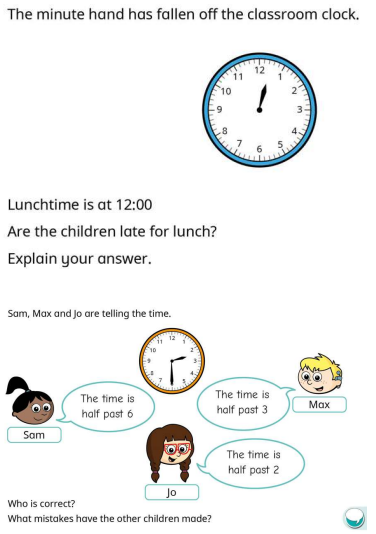
			 			
1	Recognise and use language relating to dates, including days of the week, weeks, months and years.	Calendars Diaries				Eva is practising chanting the months of the year. She says,  Eva is incorrect. Correct her mistakes.

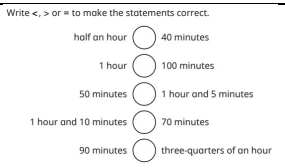
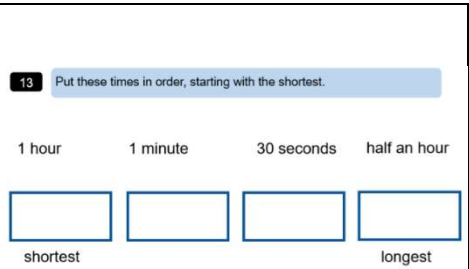
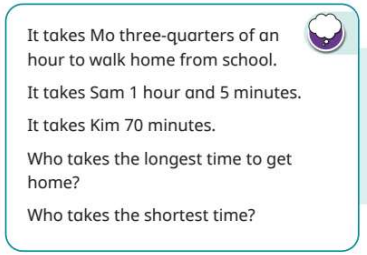
1	Measure and begin to record lengths and heights. Compare, describe and solve practical problems for lengths and heights [for example, long or short, longer or shorter, tall or short, double or half].	Measuring apparatus (Metre sticks, rulers) Multilink cubes to use as a standard unit of length	Questions that involve images for comparison, such as: Use the words taller and shorter in the sentence stems to compare the height of the man and the boy. The man is _____than the boy. The boy is_____ than the man. 	Questions without images for comparison, such as: Draw a line in your book that is **longer** than your pencil. Then draw a line that is **shorter** than your pencil. List five things in the classroom that are **taller** than you. List five items that are **shorter** than you.	 Put the four towers in order from tallest to shortest.	Rosie, Alex and Mo are comparing the height of Mrs Rose and Jack.  Rosie Mrs Rose is tall than Jack. Alex Jack is short than Mrs Rose. Mo Mrs Rose is longer than Jack. Can you improve their sentences to make them more accurate?
1	Measure and begin to record mass/weight. Compare, describe and solve practical problems for mass or weight [for example, heavy or light, heavier than, lighter than].	Scales	Questions that involve images for comparison, such as:  The _____ is heavier than the _____. The _____ is lighter than the _____. The _____ is equal to the _____.	Recording weights	Mrs Gardner has put four objects in order, starting with the **lightest.** 1. A feather 2. A car 3. A book 4. A table Can you spot Mrs Gardner's mistake?	"I'm thinking of an object. It is heavier than a pencil, but lighter than a dictionary." What object could Jack be thinking of? Prove it. How many objects can you think of?

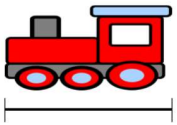
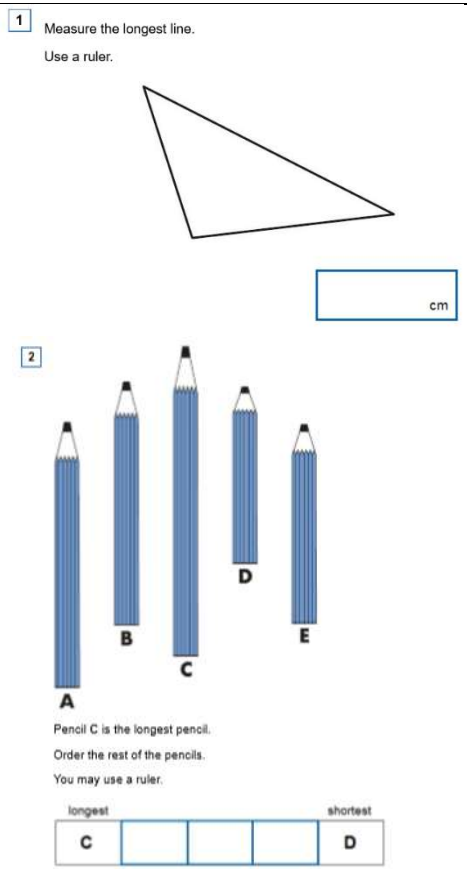
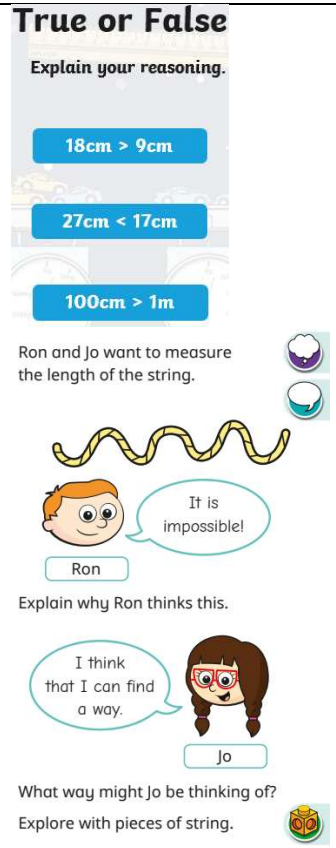
					Can you re-write the list correctly?  How many cubes does the teddy bear weigh? Explain how you know.	 Amir says, The apple is heavier than the peach, because it weighs 4 cubes. Teddy says, The apple and the peach weigh the same. Who do you agree with? Explain why.
1	Measure and begin to record capacity and volume. Compare, describe and solve practical problems for capacity and volume [for example, full or empty, more than, less than, half, half full, quarter].	Measuring jugs, beakers, cups Give children the opportunity to explore practically using water or sand. Show me full containers. Show me empty containers. Show me almost full. Show me almost	Images showing volume of liquids  A B C D	Recording volume	It takes 5 to fill 1  How many will it take to fill 2 buckets? What about three buckets? Four buckets? What do you notice? Can you continue the pattern?	Whitney pours her cups into the bottle and they fill it exactly.  She says the bottle has a capacity of four cups. Do you agree?

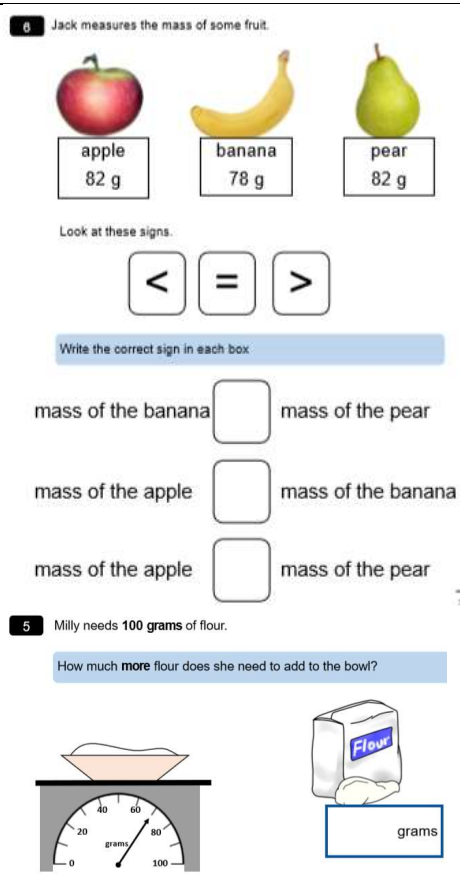
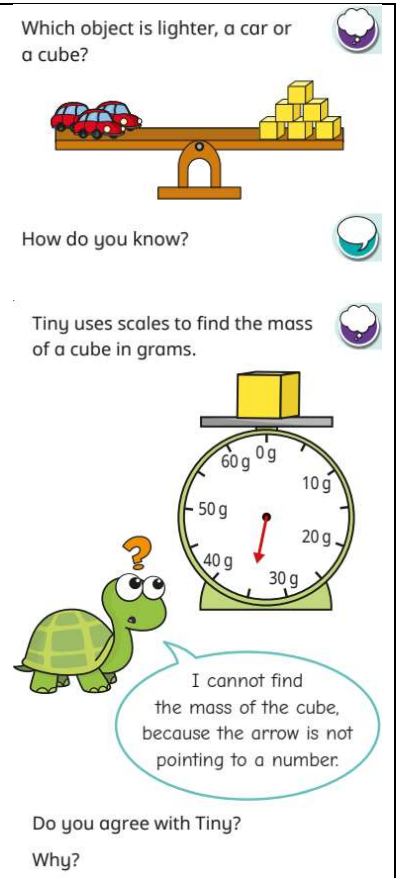
		empty.				
1	Recognise and know the value of different denominations of coins and notes.	Coins and bank notes.	Images of coins and notes	What am I? I am silver. I have 7 edges. have the picture of Britannia next to a lion on me.	How many 1p coins would you need to make 20p? How many 2p coins would you need to make 20p? How many other ways can you make 20p using the same coins? Match each coin to the correct box. One has been done for you.  	Sally says: The silver coin must be worth more because it is bigger than the gold coin.  Do you agree?

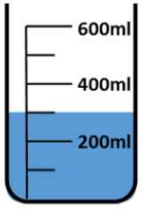
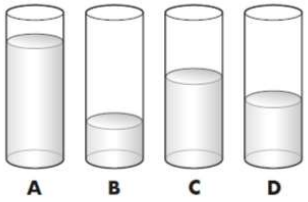
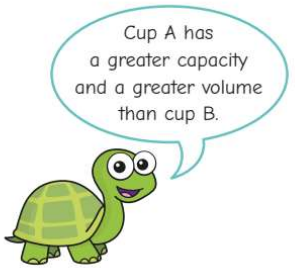
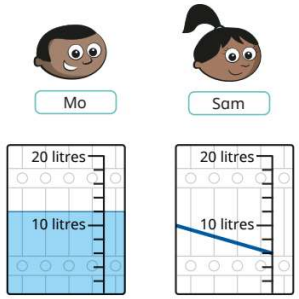
Year 2

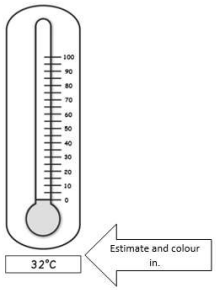
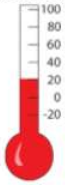
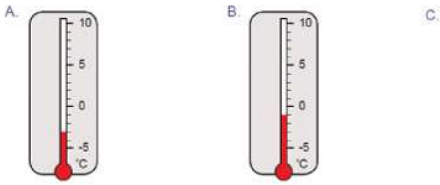
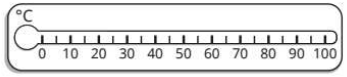
Year group:	NC L.O.	Practical	Pictorial	Abstract	Problem Solving	Reasoning
		Make it! **SAY IT**	**Show it/Draw it!** **SAY IT**	**Read/Write it!** **SAY IT**		
2	[EXS] [KEY] Tell and write the time to fifteen minutes, including quarter past/to the hour and draw the hands on a clock face to show these times. (Drip feed all year!) Know the number of minutes in an hour and the number of hours in a day.	Clocks (mini and large)	Clock faces Timetable of events to order Draw the hands on these clock faces. 	Word problems with no images. 	 	

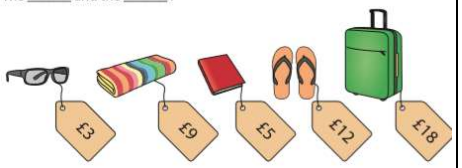
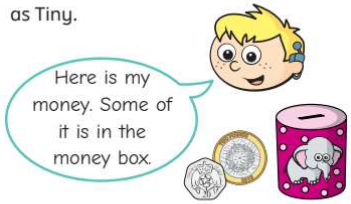
2	Compare and sequence intervals of time. Know the number of minutes in an hour and the number of hours in a day.	Clocks (mini and large)				

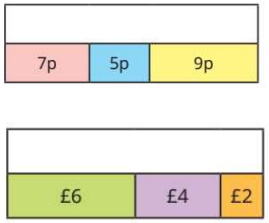
2	[EXS] Choose and use appropriate standard units to estimate and measure **length/height in any direction (m/cm);** ~~mass (kg/g); temperature (°C); capacity (litres/ml)~~ to the nearest appropriate unit, using rulers, ~~scales, thermometers and measuring vessels.~~ Compare and order **lengths,** ~~mass, volume/capacity~~ and record the results using symbols for greater than, less than and =.	Rulers: 30cm, 1m, tape measures + trundle wheel	Pictorial Scales/Rulers Testbase Questions with pictures ITP  Use a ruler to measure the length of this train.	Testbase Questions with no pictures Greater than, less than, equals symbols Measuring and drawing straight lines.		

2	[EXS] 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~~. Compare and order ~~lengths,~~ **mass,** ~~volume/capacity~~ and record the results using symbols for greater than, less than and =.	Weighing scales Balancing scales	Pictorial Scales Testbase Questions with pictures ITP  What is the mass of this bear?	Testbase Questions with no pictures Greater than, less than, equals symbols		

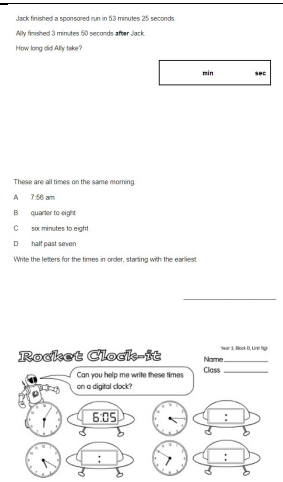
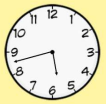
2	[EXS] Choose and use appropriate standard units to estimate and measure ~~length/height in any direction (m/cm); mass (kg/g); temperature (°C);~~ **capacity (litres/ml)** to the nearest appropriate unit, using ~~rulers, scales, thermometers and~~ measuring vessels. Compare and order ~~lengths, mass,~~ volume/capacity and record the results using symbols for greater than, less than and =.	Measuring Vessels Liquids	Pictorial Scales Testbase Questions with pictures ITP  How much water is in this container?	Testbase Questions with no pictures Greater than, less than, equals symbols	Sahil, Marta & John have 700ml of pop between them. Sahil and John drink the same amount. Marta has 100ml more than Sahil and John. How much do they all drink?  Sort the glasses from **least full** to **most full**. least full ☐ ☐ ☐ ☐ most full These 3 bottles each have more than 20ml of water in but less than 50ml. The green bottle has 5ml more than the red bottle. The blue bottle has 10ml more than the green bottle. How much could each bottle have in? 	Here are two cups of water.   Do you agree with Tiny? Why? Mo and Sam both think that they have shown 6 litres of water in the barrel.  What mistakes have they made? Talk about it with a partner.

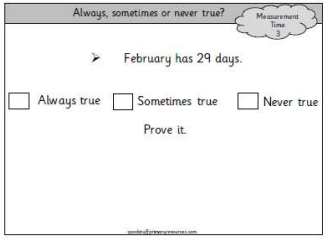
2	[EXS] [KEY] Choose and use appropriate standard units to estimate and measure ~~length/height in any direction (m/cm); mass (kg/g);~~ temperature (°C); ~~capacity (litres/ml) to the nearest appropriate unit~~, using ~~rulers, scales,~~ thermometers ~~and measuring vessels.~~	Thermometers Different temperature items/liquids Containers	Pictorial Scales Testbase Questions with pictures ITP  What temperature is the classroom? 	Testbase Questions with no pictures Greater than, less than, equals symbols	Look at the thermometers to answer the questions below.  Which of these thermometers shows the coldest temperature? What is the difference between temperature A + C? How much warmer is thermometer C than B?	Sam measures the temperature at 1 pm and at 5 pm. There is a difference of 7 °C. What could the temperatures be? Compare answers with a partner. Draw arrows to estimate where each temperature belongs on the thermometer. 1 °C 99 °C 47 °C 67 °C 

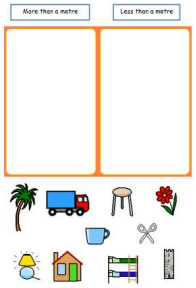
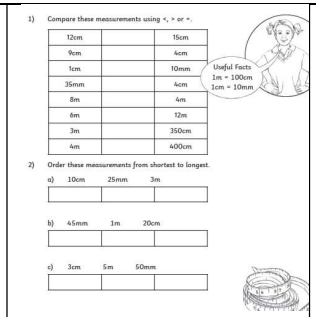
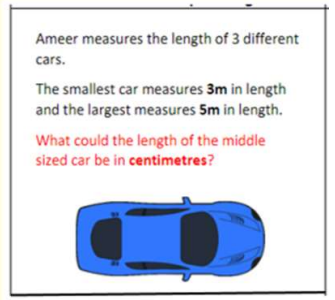
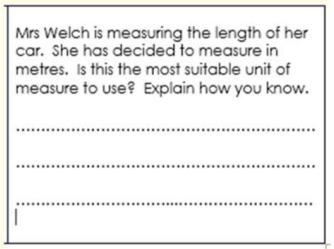
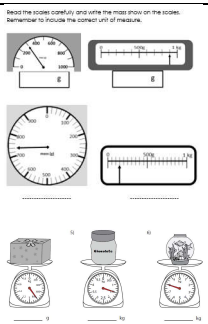
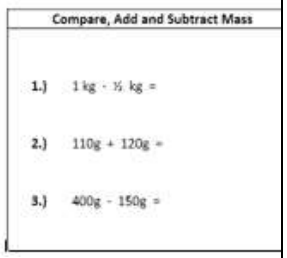
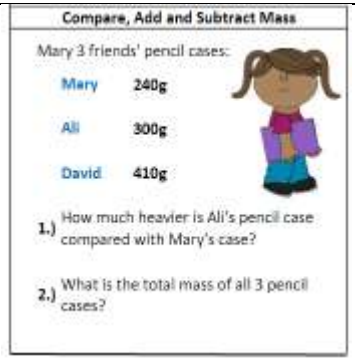
2	[EXS] [KEY] Find different combinations of coins that equal the same amounts of money. Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value.	Coins Purses Price Tags	Coins Price Tags BINGO cards	Simple number sentences using + and £ and p symbols.	**Mastery** Sid says, 'I have bought 2 items for my holiday. One item cost £9 more than the other.' What might Sid have bought? The _____ and the _____.  Look at these coins. How could you make up the same total amount one type of coin?  Holly uses a £1 coin to buy a pack of stickers. Here is the change she w  How much did the pack of stickers cost? 8 Tick (✓) **three** coins that make **50p**  Tick (✓) **four** coins that make **50p** 	Tiny has this money.  Max has the same amount of money as Tiny.  What coins could Max have in the money box? Compare answers with a partner. Mo has some money.  What is the fewest number of coins that Mo could have? How do you know?

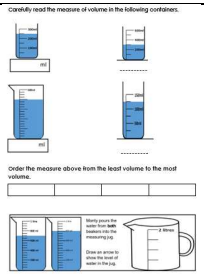
2	Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change.	Coins Purses Price Tags	N/A	Complete the bar models. 	A good activity we do here is role play shops linking to our topic e.g. Garden Centre. The children have to set it up, create prices within a particular unit and then role play customers and shop keepers. The customers have £2 to spend until they need to swap over. Change is a key aspect of this. Doing this more than once is beneficial.	Here is a price list.  Item / Price ruler 18p pencil 32p crayon 27p pen 45p glue 36p Sam buys two items for 50p. What two items does she buy? Mo buys two of the same item for 90p. What item did he buy two of?  How much could Tiny have spent? 

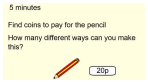
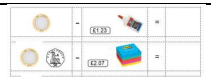
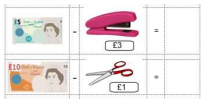
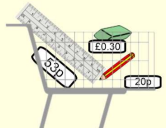
Year 3

Year group:	NC L.O.	Practical	Pictorial	Abstract	Problem Solving	Reasoning
		Make it! **SAY IT**	**Show it/Draw it!** **SAY IT**	**Read/Write it!** **SAY IT**		
3	Estimate and read time with increasing accuracy to the nearest minute. Record and compare time in terms of seconds, minutes and hours. Use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight. Compare durations of events [for example to calculate the time taken by particular events or tasks]. [KEY] Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks. Moved in 2023-24 due to teaching whole class PPA cover.	Setting the time on the clock. Reading the time on a given clock. Timing races. How long does It take to write your name 10 times? Will it take Caitlyn less or more time than Sam?	 	 	 Holly takes **half an hour** to walk home from school. She arrives at school at 8:25 am. At what time did she leave home?	➢ The minute hand is on the 4 and the hour hand is just past the 7. It is 20 minutes to 8. True or false? Explain your answer. ➢ My birthday is in a month which has less than 31 days. What months could my birthday be in? ➢ Sue has completed this table for her homework. Her writing is in black. Has she made any mistakes? Correct any you find. Roman numeral / Digits VI / 4 IX / 11 V / 5 X / 10 ➢ Jen says the time is around 43 minutes past 5.  True or false? Explain your answer.

	Drip feed this all year				William wants to travel to Paris by train. He needs to arrive in Paris by **5:30 pm**. Circle the **latest time** that William can leave London. **Leaves London** / **Arrives Paris** 12:01 – 15:22 12:25 – 15:56 13:31 – 16:53 14:01 – 17:26 14:31 – 17:53 15:31 – 18:53 16:01 – 19:20	
3	Know the number of seconds in a minute and the number of days in each month, year and leap year. Drip feed this all year	Calendars Timers Analogue and digital clocks Diaries	Here is part of a calendar: **December** Mon Tues Wed Thur Fri Sat Sun 1 2 3 4 6 7 8 9 10 13 14 15 20 21 22 27 28 How many days are **missing** from the calendar?	Write the missing numbers: 60 months = ☐ years 72 hours = ☐ days 84 days = ☐ week	Joe goes skating every Saturday. He went skating on Saturday 1st January. Altogether, how many times did he go skating in January?  ☐	Jaden says: *"Every month has either 30 or 31 days."* Explain why Jaden is **not** correct.

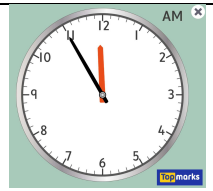
3	[KEY] Measure, compare, add and subtract: **lengths (m,cm,mm);** ~~mass (kg,g); volume, capacity (l,ml).~~ Metres first, then centimetres and the millimetres. Measure the perimeter of simple 2-D shapes.	Measure meters outside in the playground. How wide are the goal posts? How tall is the climbing wall? What is the perimeter of the playground? Of the greenhouse? Of the Huff and puff shed?			**Jay is measuring the perimeter of his maths book. The width is 21cm and the length is 30cm. What will the other sides measure? What will the total perimeter be?**	 
3	[KEY] Measure, compare, add and subtract: ~~lengths (m,cm,mm);~~ **mass (kg,g);** volume, capacity (l,ml).	Scales and various objects to weigh. Can pupils estimate weights of objects? Can the say whether one object is lighter or heavier than another?		 There are 1000g in 1Kg How many grams would there be in 5 Kg Mrs Welch needs ½ kg of sugar. How many grams will this be?		

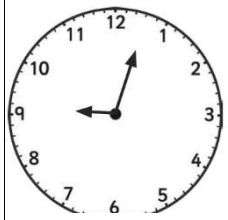
3	[KEY] Measure, compare, add and subtract: ~~lengths (m,cm,mm);~~ ~~mass (kg,g);~~ **volume, capacity (l,ml).**	Measure the amount of water in your water bottle, in a small container, in a cup, etc. Compare measuring equipment of different sizes. Is the tallest one always going to have the most capacity? Why / why not?			**Compare, Add & Subtract Units of Capacity** Georgina is washing her bike.  **She starts with 900 millilitres of soapy water in a bucket.** She uses **145** millilitres to wash both wheels. She uses another **380** millilitres to wash the rest of the bike. How many millilitres are left in Georgina's bucket? **Compare, Add & Subtract Units of Capacity**  Billy, Kenny and Donna each have a bottle of water. Billy - 200ml Kenny - 600ml Donna - 300ml **1.)** How much water do Billy, Kenny and Donna have altogether? **2.)** How much more water is needed to make **2 litres** (2000 ml) of water?	

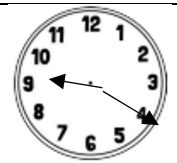
3	[KEY] Add and subtract amounts of money to give change, using both £ and p in practical contexts.	Turn classroom into shop and have a buyer and seller  	  		Problem solving and reasoning: Mrs Welch has one pound to spend. She puts these items in her trolley. Does she have enough to buy them all?  Explain how you know.	**True or false?** Liam thinks: *I can make 20p by using a 15p coin and a 5p coin* **Explain**

Year 4

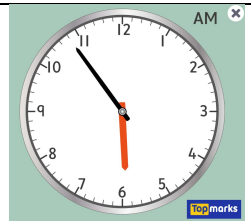
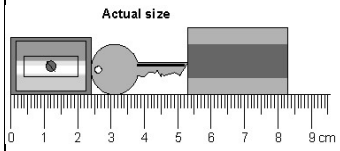
Year group:	NC L.O.	Practical	Pictorial	Abstract	Problem Solving	Reasoning
		Make it! **SAY IT**	**Show it/Draw it!** **SAY IT**	**Read/Write it!** **SAY IT**		
4	Read, write and convert time between analogue and digital 12- and 24-hour clocks. (Teach first then drip feed all year!)	Clocks (teaching clocks and online clocks)	Write the time shown on the clock in digits and words:    	Grace says, 'On my clock face, the big hand is on the 4 and the little hand is between the 8 and the 9' What is the time on Grace's clock face?	These are the radio programmes one morning. 7.00 Music show 7.55 Weather report 8.00 News 8.15 Travel news 8.25 Sport 8.45 Holiday programme Josh turns the radio on at 8:05 How many minutes does he have to wait for the Travel news? Sanaa says, *'On my Roman Numeral clock face, the big hand is on the VI and the little hand is between the IX and the X'* What is the time on Sanaa's clock face?	Do these events happen in the a.m. , p.m. or both? Write your answer next to each event: • Coming home from school • Eating your breakfast • Having a shower • Going to bed • Brushing your teeth • Going shopping • The sun coming up • The sun going down Mr Moore is trying to complete the boxes for the time shown on the analogue clock.

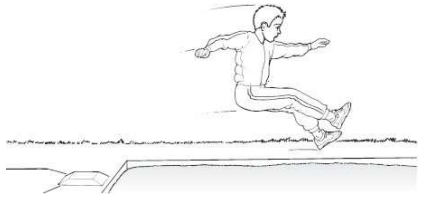
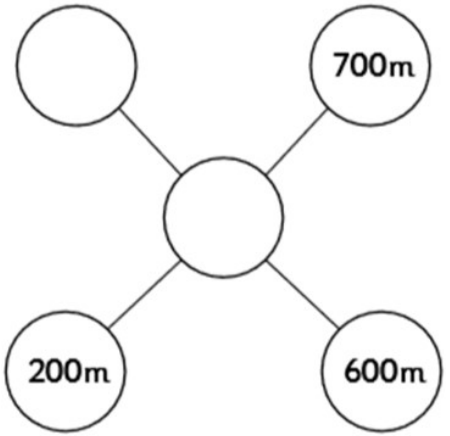


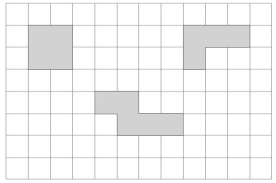
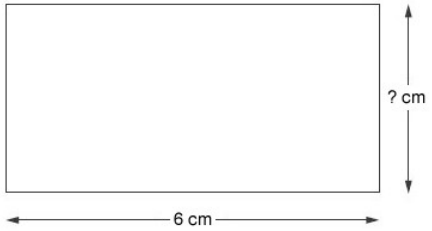
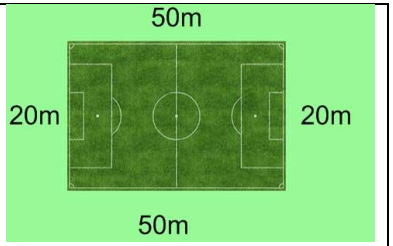
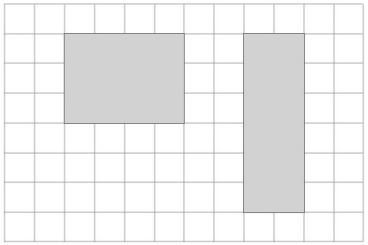


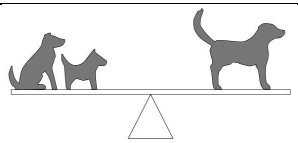
Time in words	12 hour clock	Analogue clock
		

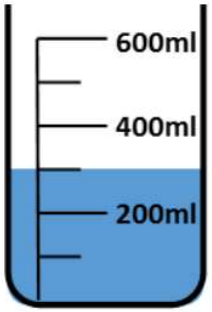
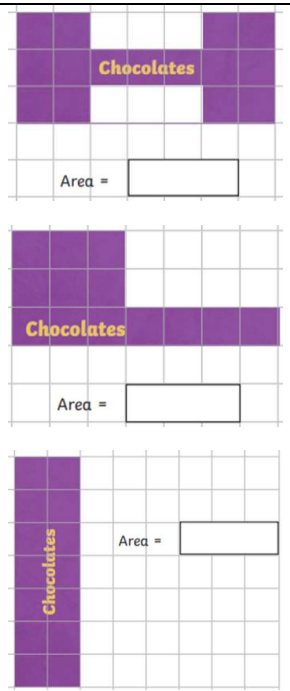
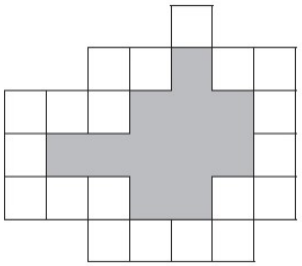
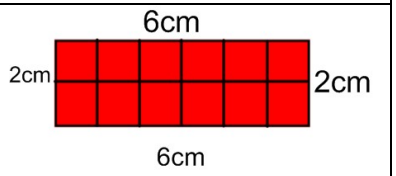
Explain why Mr Moore **cannot** do this.

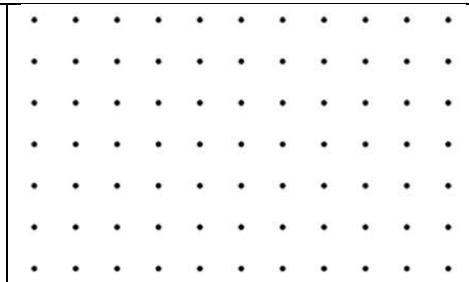
						
4	Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days. Drip feed this all year			Complete the sentences: There are _____ seconds in a minute. There are _____ minutes in an hour. There are _____ hours in a day. There are _____ months in a year.	Write the missing numbers. 60 months = years 72 hours = days 84 days = weeks	
4	[KEY] Convert between different units of measure [for example, kilometre to metre; hour to minute]. Order: Length, Perimeter, Mass, Volume. Complete time conversions when doing the time objectives.	Rulers Metre sticks Trundle wheels Measuring jugs Scales Clocks (analogue and digital) Cutting objects to specific sizes.	Here are a pencil sharpener, a key and a rubber.  What is the length of all three objects, rounded to the nearest centimetre?	½ a metre = ? cm 0.3 metres = ? cm 0.45 metres = ? cm ¼ of a metre = ? cm 0.05 metres = ? cm 3/100 of a metre = cm	Kate has a piece of ribbon one metre long. She cuts off 30 centimetres. How many centimetres of ribbon are left?  Mr Tyler is 1m 97 cm tall. His young daughter is 83 cm tall. What is the difference in their heights Max jumped **2 ¼ metres** on his **second** try at the long jump.	

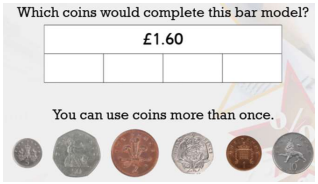
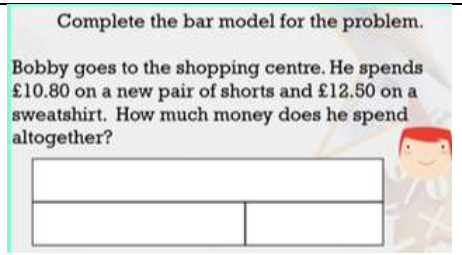
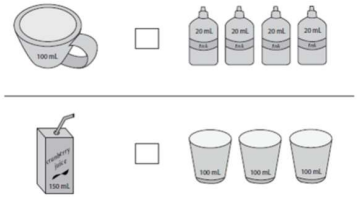
					This was **75 centimetres** longer than on his **first** try.  How far **in metres** did he jump on his **first** try? Complete this diagram so both of the diagonal lines have a sum of 1 kilometre. 	

4	Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres.			Rose made shapes using four squares on centimetre square paper She calculated the perimeter of each shape.  What is the length of the **shortest** perimeter? What is the length of the **longest** perimeter? Not to scale  What is the perimeter of this square?	The perimeter of this rectangle is 20 cm. The length is 6 cm. **Not to scale**  How long is the **width** of the rectangle?	 Mrs Gardner thinks the perimeter of the rectangle above is 140 metres. Mr Moore thinks the perimeter of the shape above is 1000 metres. Who is correct? Prove it! What mistake might've been made? Look at the shaded rectangles drawn on a  centimetre square grid. Sam says, "The two rectangles have the same area as each

						other and the same perimeter as each other" Is Sam correct? Explain how you know.
4	[KEY] Convert between different units of measure [Grams to Kilograms]. Order: Length, Perimeter, Mass, Volume. Complete time conversions when doing the time objectives.	Scales Weights	 The large dog weighs 9kg One of the smaller dogs weighs 4800g What is the weight, in grams, of the other small dog?	Complete this table, the first two have been done for you. Kilometres and grams / Grams 3kg and 0 g — 3,000 g 8kg and 200 g — 8,200 g 4kg and 300g — 5,400g 6kg and 570g — 7,308g 6kg and 85g — 2,009g	**Half a kilogram** of flour makes 4 cakes. How many **grams** of flour are there in **one cake?** Senna and Roanna each have a parcel. Senna's parcel weighs 1 ¼ kg. Roanna's parcel weighs 1,800 g How many more grams does Roanna's parcel weigh than Senna's parcel?	Max has a magical gold bar. Every day the gold bar trebles in weight. On day one the bar weighs 8 grams. What will be the weight of the bar on day two? What will be the weight of the bar on day four? How many days will it take for the bar to weigh more than two kilograms?
4	[KEY] Convert between different units of measure [Litres and Millilitres]. Order: Length, Perimeter, Mass, Volume. Complete time conversions when	Measuring jugs Scientific syringes Liquid containers	Measuring images:	Complete this conversion table, the first two have been done for you. Litres and millilitres / Millilitres 1l and 0ml — 1,000ml 2l and 600ml — 2,600ml 3l and 490ml — 4,365ml	This jug holds ½ a litre. 	Miss Tonkin's water butt is leaking. Every day the water butt leaks **half** the water in it. On day one there's 32 litres in the water butt. How many litres are there on day two? How many litres are there on day three?

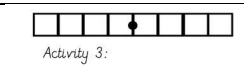
	doing the time objectives.			8l and 78ml 7,050ml 5l and 7ml 3,003ml	This bucket holds 4 litres  How many **full** jugs of water are needed to fill the bucket?	After how many days will there only be 250ml left in the water butt?
4	Find the area of rectilinear shapes by counting squares.	Dienes and multilink cubes to demonstrate area on a surface Pegboards or Geoboard app.	Most questions will be pictorial due to the "Counting squares" element of the objective.		Here are 20 squares around the outside of a shaded shape.  What is the area of the shaded space? Grace has a rectangle that has sides of 4 cm and 5 cm. Draw a different rectangle that has the same area. Join the dots to draw a rectangle that has an area of 20 cm2 and a perimeter of 18 cm.	 Mrs Gardner thinks the area of the rectangle above is 16cm^2. Mrs Tibbles thinks the area of the shape above is 12cm^2. Who is correct? Prove it! Mrs Gardner says "You don't need to be told every measurement to find the area of a rectangle or square." Do you agree? Can you explain why / why not

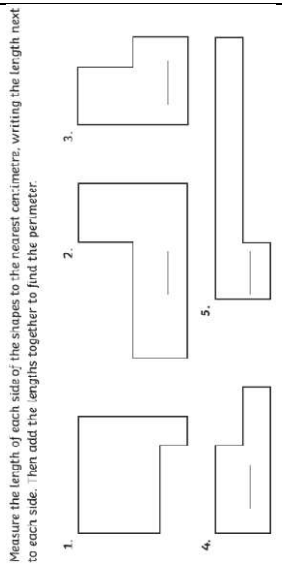
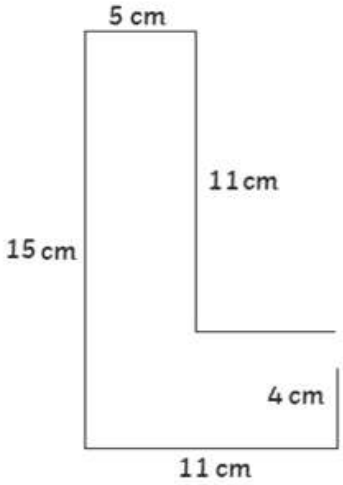
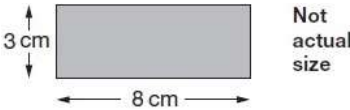
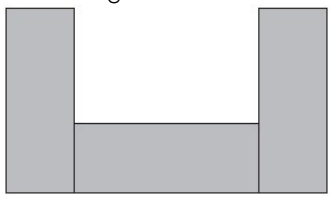
						

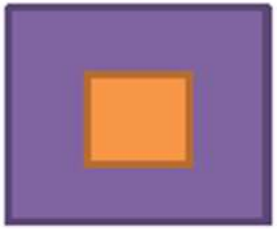
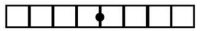
4	Estimate, compare and calculate different measures, including money in pounds and pence. Teach money part only, the rest of these will be covered with the length / mass / volume objectives.	Rulers Metre sticks Trundle wheels Measuring jugs Scales Coins Bank notes	 	Calculate the missing numbers: 6 x ? = £1.80 ? x 7 = £1.40 Two of these sentences could be true. Tick (✓) the two sentences that could be true. • Adam's pencil is 12 centimetres long. • Leah is 12 metres tall. • Jake's glass holds 12 litres of milk. • Kate's younger sister weighs 12 kilograms.	 The table below shows the ticket prices for the theatre: | | **Afternoon** | **Evening** | |---|---|---| | **Adult** | £16.25 | £20.50 | | **Child** | £8.75 | £9.50 | Arnold and Esther do a sponsored run for charity. They run 6,000km altogether. Esther runs double the distance that Arnold runs. How many kilometres does each person run? Comparing measures What sign would you use? Explain your answer? Create your own using <> = 	

Year 5

Year group:	NC L.O.	Practical	Pictorial	Abstract	Problem Solving	Reasoning
Objectives running through the unit		Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.				
		Make it! **SAY IT**	**Show it/Draw it!** **SAY IT**	**Read/Write it!** **SAY IT**		
5	Solve problems involving converting between units of time.	Digital and analogue clocks (Link Roman Numerals in where possible) Calendars Timetables	Images of clocks, calendars and timetables.	60 months = ? years 72 hours = ? days ? weeks = 84 days Complete each sentence using a number from the list below. 120 240 600 1,440 3,600 6,000 There are _____seconds in an hour. There are _____ minutes in a day.	Isabella swims **4 lengths** of a swimming pool. Her target is to swim the lengths in **under 5 minutes**. It takes her 319 seconds. Explain why Isabella did not achieve her target.  Cody runs for 25 minutes on Monday, 1:10 on Tuesday and three-quarters of an hour on Wednesday. How much time did he spend running over the three days?	At Roche CP School a school year has 38 weeks of 5 days. Mr Moore thinks that in a non-leap year a child will have **over 200 days off.**  Is he correct? Prove your answer.
5	[KEY] Convert between different units of metric measure (kilometre and metre; centimetre	Rulers Metre sticks	Pictorial images of : Rulers Metre sticks	Conversion tables PV charts for X÷ by powers of 10		**True or false:** 1 metre = 1000 centimetres.

	and metre; centimetre and millimetre). Order: Length, Perimeter, Mass, Volume. Complete time conversions when doing the time objectives.	Trundle wheels Weighing scales / balances Measuring cups / jugs	Trundle wheels Weighing scales / balances Measuring cups / jugs Map scales	Complete these conversions: Metres / Centimetres / Millimetres 4 / / / 250 / / / 4000 / 45 / 28 / / / / 3500	 Activity 3:  I am cooking some rice. The recipe says I need 120g for two people. How many kilograms would I need if I am cooking for 8 people?  	

5	[KEY] Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres.	Objects that can be measured and combined to make rectilinear shapes e.g. tables, the quad.	Images of rectangles, squares and composite rectilinear shapes.		What is the perimeter of this composite rectilinear shape? 	Alfie has some rectangles.  He makes this shape using three of the rectangles.  Alfie says: The perimeter of the new shape will be **3 times as big** as the single rectangle. Explain why Alfie is **incorrect.**

<table>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Here is a square inside another square.
 
The perimeter of the inner square is 16cm.
The outer square's perimeter is four times the size of the inner square.
What is the length of one sides of the outer square?
How do you know?
What do you notice?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[KEY] Convert between different units of metric measure (gram and kilogram).</td>
<td></td>
<td></td>
<td>Conversion tables.
<table><tr><th>Kilograms</th><th>Grams</th></tr><tr><td>7</td><td></td></tr><tr><td></td><td>8000</td></tr><tr><td>12</td><td></td></tr><tr><td></td><td>3580</td></tr><tr><td>4.2</td><td></td></tr><tr><td></td><td>500</td></tr></table></td>
<td> 
Activity 3:
I am cooking some rice. The recipe says I need 120g for two people.
How many kilograms would I need if I am cooking for 8 people?
  
Here is a scale with some large and small bricks on:</td>
<td>Captain conjecture says:
I think that 5Kg is equal to 500g.
 
Do you agree?</td>
</tr>
</table>

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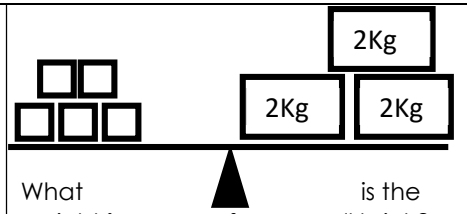
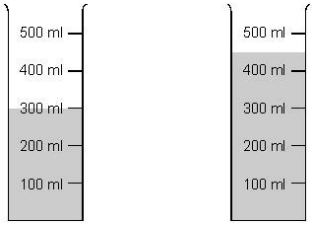
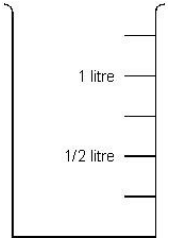
<td> 

What is the weight in grams of one small brick?

Chen is cooking some pasta.

The recipe says he needs 650 grams of pasta for 4 people.

How many kilograms of pasta does he need for 12 people?</td>
<td>Explain why / why not.</td>
</tr>
<tr>
<td></td>
<td>[KEY] Convert between different units of metric measure (litre and millilitre).</td>
<td></td>
<td> 

All the water in these two containers is to be poured into the empty container below.
 
</td>
<td>Conversion tables.
<table><tr><th>Litres</th><th>Millilitres</th></tr><tr><td>3</td><td></td></tr><tr><td></td><td>5500</td></tr><tr><td>3.2</td><td></td></tr><tr><td></td><td>4320</td></tr><tr><td>0.8</td><td></td></tr><tr><td></td><td>20 000</td></tr></table></td>
<td>A bottle holds 1 litre of lemonade.

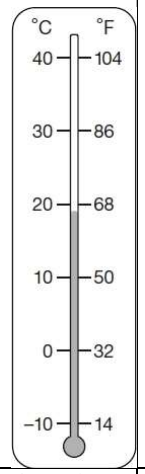
Rachel fills five glasses with lemonade.

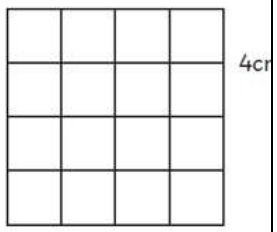
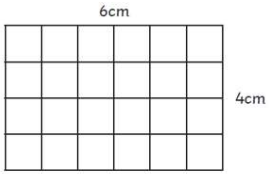
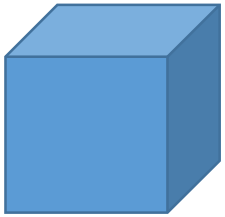
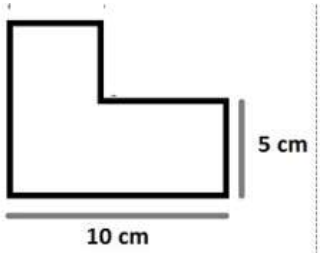
She puts 150ml of lemonade in each glass.

How many millilitres of lemonade is left in the bottle?

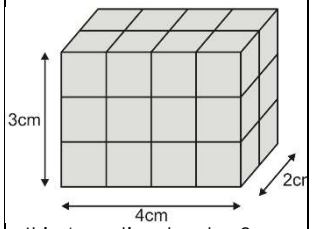
 

Cola is sold in bottles and cans.</td>
<td></td>
</tr>
</table>

			Draw where the water level will be in the container.		 Alex buys 5 cans and 3 bottles. She sells the cola in 100 ml glasses. She sells all the cola. a) How many glasses does she sell? Alex charges 50 p per glass. b) How much profit does she make?	
5	Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints.	Measuring implements with metric and imperial measurements. Inch-cm rulers Litre-pints measuring cups / jugs g/kg – lbs/ozs weighing scales.	Images of measuring implements with metric and imperial measurements. Inch-cm rulers Litre-pints measuring cups / jugs g/kg – lbs/ozs weighing scales. Conversion graphs	Conversion tables	Victoria buys **4 pints** of milk. Give the volume of milk Victoria bought in **millilitres** and **litres.** This thermometer shows temperatures in both °C and °F. Work out what **25°C** is in °F 	Mr Moore has 2 pounds of jam and Miss Goatman has 1kg of jam. Who has more jam? Prove your answer. Isaac has **9 feet** of rope. He is constructing a wall border that is **3 metres** in length. Isaac says: "I need at least another **metre** of rope." Do you agree with Isaac? Explain your reasoning.
5	[KEY] Calculate and compare the area of rectangles (including squares), and including using standard units,	Objects that can be measured and combined to	Images of rectangles, squares and composite rectilinear shapes.	Calculate the area of these shapes:	Can you draw (not to scale) the following shapes with an area of 64cm^2. a. A square.	Sarah wants to paint a wall that is 12 metres long and 5 metres high. She has two tins of paint that will each cover 24m2.

	square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes.	make rectilinear shapes e.g. tables, the quad.		     Use the words in bold below to complete the sentences **two** **factors** **perimeter** **area** **prime number** **arrays** **commutative** The _____ of a shape is the space taken up within its perimeter	b. A rectangle with a length different to its width. c. A compound shape made up of two rectangles. The surface area of a 3D shape can be found by adding up the area of all its faces. Find the area of one of this cube's faces, then find the surface area of the whole cube. 	Does Sarah have enough paint? Prove your answer. Cristiano is trying to calculate the area of this compound shape:  Explain why he cannot find the area of this shape.

				The _____ of a shape is the sum length of all its sides. There can only be _____ possible ways of constructing a rectangle with an area of 13 squares because 13 is a _____. The number of different rectangles that can be constructed for a given area is dependent on the number of _____ that number has. When constructing rectangular areas some rectangles will look the same. This is because rectangles are like multiplication_____ _____ and multiplication is _____ .		
5	Estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water].	Dienes Empty containers Empty jugs / cups	Images of cubes and cuboids Images of containers partially filled.	This cuboid is made from centimetre cubes.	Circle the correct amount A tea cup is likely to hold about 	



It is 4 centimetres by 3 centimetres by 2 centimetres.

What is the **volume** of the cuboid?

About how much milk does a baby's bottle hold?
Tick (✔) the correct answer.

15 ml
150 ml
1500 ml

☐ 3 millilitres

☐ 300 millilitres

☐ 3 litres

☐ 300 litres

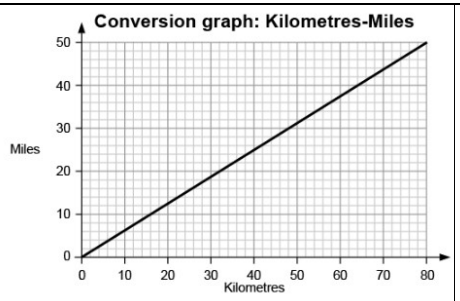
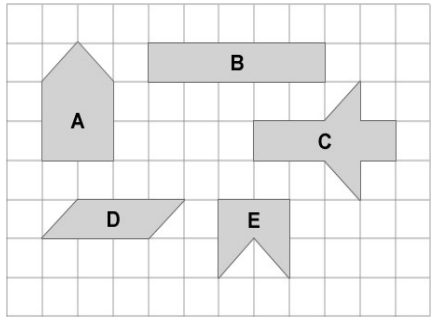
Jon has **20** centimetre cubes.

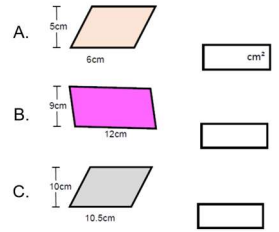
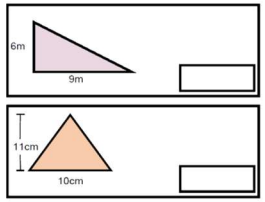
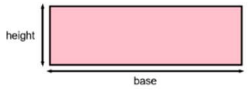
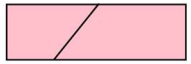
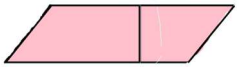
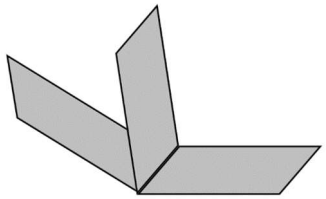
He wants to make a cube with edges that are **3** cm long.

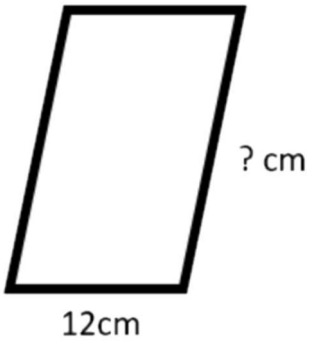
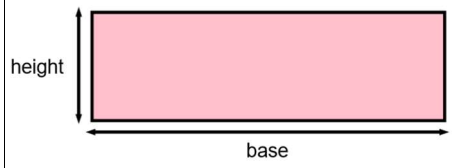
How many **more** centimetre cubes does he need?

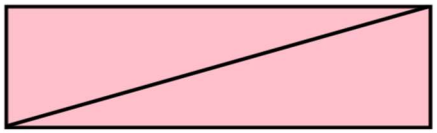
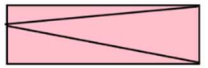
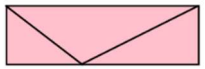
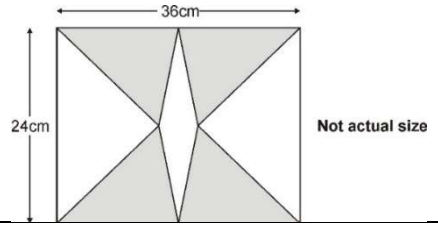
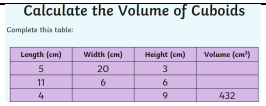
Year 6

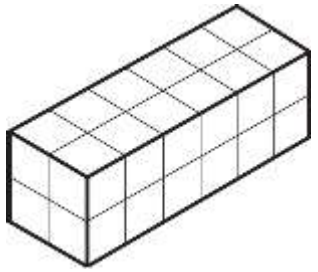
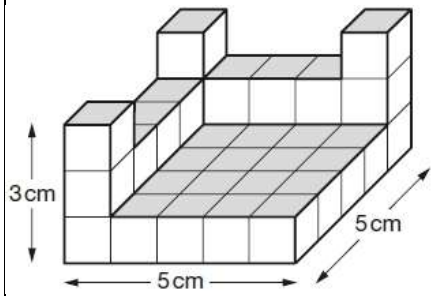
Year group:	NC L.O.	Practical	Pictorial	Abstract	Problem Solving	Reasoning
Objectives running through the unit						
6	[EXS] [KEY] Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places.	Rulers Metre sticks Trundle wheels Weighing scales / balances Measuring cups / jugs Analogue and digital clocks / watches.	Pictorial images of : Rulers Metre sticks Trundle wheels Weighing scales / balances Measuring cups / jugs Map scales Analogue and digital clocks / watches.	Complete the table below: <table><tr><th>Kilometres</th><th>Metres</th><th>Centimetres</th><th>Millimetres</th></tr><tr><td></td><td>1</td><td></td><td></td></tr><tr><td></td><td></td><td>252</td><td></td></tr><tr><td>5.2</td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>1346</td></tr></table> What is 444 minutes in hours and minutes?	Mr Moore enters a 2km race but only manages to run $\frac{1}{4}$ of the distance. How many metres does he run? <table><tr><td colspan="4">2km</td></tr><tr><td></td><td></td><td></td><td></td></tr></table> Miss Goatman ran 5km on Saturday and 2,400m on Sunday. Mr Moore ran 6.3km on Saturday and 730m on Sunday. How far did Mr Moore and Miss Goatman run this weekend in total? Give your answer in kilometres. Tom is cooking some pasta. The recipe says he needs three hundred and fifty grams of pasta for 4 people. How many **kilograms** of pasta does he need for 20 people?	Faye measures the length of the classroom to be 13,128mm. Is this the most appropriate unit of measure for that length? How would you write that length? Explain your choice and convert Faye's measurement. Imagine we talked about time using decimals. Would 2·3 hours be: 2 hours and 3 minutes 2 hours and 20 minutes 2 and a half hours, or 2 hours and 18 minutes? Explain your decision.
6	[EXS] [KEY] Solve problems involving the calculation and conversion of units of	**See above.**				

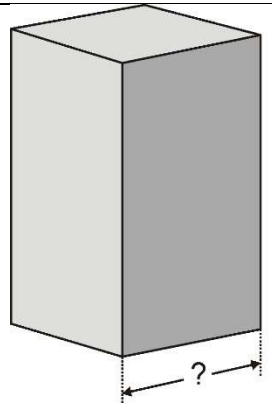
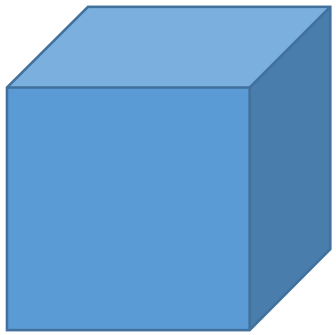
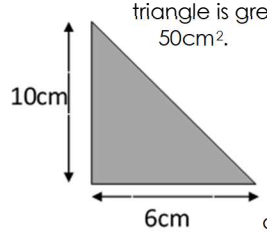
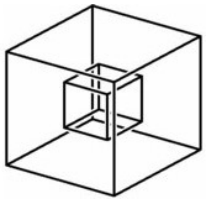
	measure, using decimal notation up to three decimal places where appropriate.					
6	Convert between miles and kilometres.	Car speedometer Maps with scales in miles and km	Conversion graphs Car speedometers Map scales	Write the correct whole number in the box. **5 miles** is approximately ☐ **kilometres.**	 Use the graph to work out how many miles are equal to 20 km. Use the graph to work out how many kilometres are equal to 40 miles.	
6	Recognise that shapes with the same areas can have different perimeters and vice versa.	Objects that can be measured and their areas and perimeters found e.g. maths shapes, tables, the quad.	Images of rectangles, squares and other shapes that can have their area and perimeter calculated.	In your books draw 3 rectangles that have a perimeter of 18 lengths, where one length is the length of one square in your book. Label the area of each rectangle.	The fence problem I have 20 fence panels, each 1 metre in length. I want to create a quadrilateral space that gives me the largest area to grow crops. If I can't cut the fence panels what is largest area I can make? The diagram shows some shapes on a centimetre square grid. 	The fence problem - Extension What shape gave you the largest area to grow crops? Would this shape always give you the largest area? Prove your theory by finding the largest area for a fence with a perimeter of 36 metres.

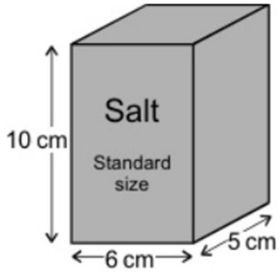
					Which two shapes have the same **perimeter** as shape A?	The%20Tetris%20paving%20conundrum Tetris%203%20Star.docx The%20Tetris%20paving%20extension.d
6	Calculate the area of parallelograms and triangles.	Large, plastic Meccano (In DM's room) Maths shapes	Images of triangles and parallelograms, including all types of triangle.	*Find the area of these parallelogram  Find the area of these triangles: 	*On your desk there are some Post-it notes. • Stick one in your book. • Measure the base and height. • Round these measurements to the nearest centimetre. • Use the rounded measurements to calculate an estimated area of the Post-it note.  *Now do the following: • Cut a straight line at an angle across the Post-it note.  • Put the two straight ends together to create a parallelogram.  *Has your shape changed? *Has the perimeter changed? *Has the area changed?	 Here is a company logo consisting of three identical parallelograms. The total area of the logo is 108cm² and the base and height of each parallelogram is a whole number. List all possible values for the base and height of **one parallelogram.** Look at all the possible combinations for the length and base of **one parallelogram** in the previous question. Which combination do you think would fit best for the parallelograms in the logo? Explain your answer.

					*What is the area of your parallelogram? The area of this parallelogram is 180cm^2. Calculate its height.  *On your desk there are some Post-it notes. They're the same size as yesterday. Pick up one Post-it and stick it in your book. Write the area on the Post-it *Take another Post-it and cut a straight line from one corner to the other.  What shapes do you have now? Can you calculate the area of one of the shapes? **triangle**.	

					 *Take another Post-it and make two cuts from adjacent corners to an opposite length What shapes do you have now? Can you calculate the area of the larger shape? Combine the two smaller shapes. Do you notice anything?   **The diagram shows **4 identical shaded triangles** in a rectangle. The rectangle measures **36 centimetres** by **24 centimetres**. Calculate the **area** of **one shaded** 	
6	Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3), and	Dienes Multi-link cubes Cubes and cuboids	Images of cubes and cuboids, including composite 3D shapes.		Cleo has **24** centimetre cubes. She uses all 24 cubes to make a cuboid with dimensions **6** cm, **2** cm and **2** cm.	Can you find two or more different cuboids each with a volume of 64 cm3? What's the same and what's different about your cuboids?

	extending to other units [for example, mm3 and km3].				 Write the dimensions of a **different** cuboid she can make using all 24 cubes. _____ cm, _____ cm and _____ cm This shape is made of wooden centimetre cubes.  How many **more** centimetre cubes are needed to make it into a solid cuboid 3 cm tall, 5 cm long and 5 cm wide? A cuboid has a **square base**. It is **twice as tall** as it is **wide**. Its volume is **250 cubic centimetres**.	Lesson%202%20NRICH.docx Cubes%20within%20Cubes%20QA-E%20(Cubes%20within%20Cubes%20QF-G%20(Cubes%20within%20Cubes%20QH%20L

					 **Not actua** Calculate the **width** of the cuboid.	
6	Recognise when it is possible to use formulae for area and volume of shapes. **Can be covered in algebra**	Dienes Multi-link cubes Cubes and cuboids Large, plastic Meccano (In DM's room) Maths shapes	Images of 2D and 3D shapes.	*Match the formula to the corresponding area / volume. The same formula may be used more than once. Base x Height — Volume of a cuboid Base² — Area of a rectangle Base x Height x Width — Area of a triangle Base³ — Area of a parallelogram Volume of a cube (Base x Height) ÷ 2 Area of a square	Write the dimensions of a cuboid that has the same **volume** as the cube below:  8cm Not to scale Salt boxes come in two sizes:	Kieran says that the area of this triangle is greater than 50cm².  Do you agree? Prove your answer This diagram shows a smaller cube inside a larger cube. The volume of the larger cube is 1000cm². 

					 What is the volume of this special offer box of salt, which is 20% bigger? 	The volume of the smaller cube is between 30% and ¾ of the volume of the larger cube. List **all** the possible **lengths** of the smaller cube.