

HIAS MOODLE+ RESOURCE

Year 5 Unit Plan 5.3

Measurement

Autumn Term

HIAS Maths Team
September 2026
Final version

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Overview

This document contains...

Year 5 Unit Plans linked to the Hampshire Medium Term Overview

Points to consider when using this resource:

These unit plans provide an example of how medium-term planning could be developed into units of work. These unit plans will need to be adapted to meet the needs of pupils. The unit plan provides an outline of a possible learning journey with suggestions of types of tasks that could be used. They also identify required prior learning, some common misconceptions and an indication of key skills pupils need to secure competency. It is assumed that teachers will make use of appropriate mathematical representations (manipulatives, visuals and symbolic) to support conceptual understanding for pupils alongside procedural fluency.

National Curriculum Links:

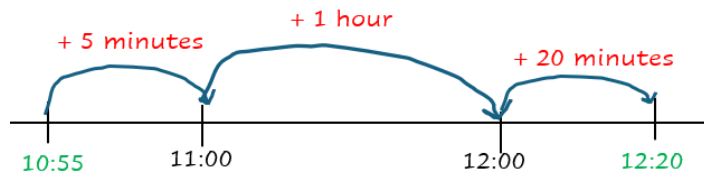
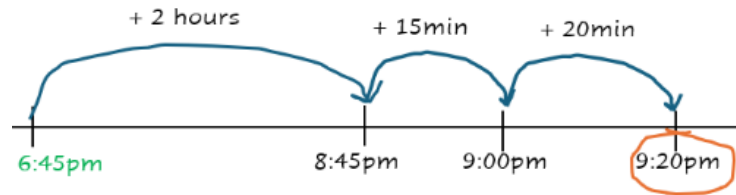
Measurement

Pupils should be taught to:

- Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)
- Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints
- measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres
- Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes
- Estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water]
- Solve problems involving converting between units of time
- Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.

<p>This unit focuses on developing pupils' understanding of measurement through practical application and problem solving. Pupils build fluency in reading, writing and converting time between analogue and digital formats (including 12- and 24-hour clocks), as well as calculating durations, start and end times. They extend their knowledge of metric units by converting between measures of length, mass, and capacity using understanding of place value and scaling. Pupils are also introduced to estimating volume and capacity, and begin to explore approximate equivalences between metric and common imperial units.</p>		<p>Notional Time: 10 sessions</p>
<p>Check and Refresh - <i>skills and knowledge that pupils need to know</i></p>	<p>Verbal coding- <i>precise mathematical language to model during worked examples</i></p>	<p>Mastering Key Facts in Key Stage 2 – developing fluency and automaticity</p>
<p>Multiplying and dividing by 10, 100 and 1000.</p> <p>Telling the time on an analogue clock to the nearest 1 minute.</p> <p>Telling the time on a 12-hour digital clock.</p> <p>Key conversion facts, e.g 60 minutes in 1 hour, 1000cm in 1m.</p>	<p>When I convert ___ to ____, I multiply by 10/100/1000 The digits move one/two/three places to the left because the value becomes 10/100/1000 times larger.</p> <p>When I convert ___ to ____, I divide by 10/100/1000 The digits move one/two/three places to the right because the value becomes 10/100/1000 times smaller.</p>	<p>Y4 Recap: Number bonds and related number bonds to 1,000,000</p> <p>Addition by partitioning up to 4-digit numbers (e.g. 2235 + 1054)</p> <p>Subtraction by partitioning up to 4-digit numbers (e.g. 9627 – 4015)</p> <p>Recall multiplication and division facts for multiplication tables up to 12 × 12</p>
<p>Mathematical Concepts- <i>important pieces of information learners should take away from the unit</i></p>	<p>Watch out for</p>	<p>DfE Ready -to- progress criteria</p>
<p>Reading and interpreting time on analogue and digital clocks.</p> <p>Converting between analogue, 12-hour and 24-hour representations.</p> <p>Calculating with time.</p> <p>Converting metric measures.</p> <p>Working with imperial measures.</p>	<p>Pupils who struggle to convert between analogue, 12-hour and 24-hour digital time.</p> <p>Pupils who do not recognise when to multiply or divide by 10, 100 or 1000 when converting units of measure.</p> <p>Pupils who have insecure conversion facts.</p> <p>Pupils who struggle to calculate start times, end times and time intervals accurately.</p>	<p>5NPV-1 5NPV-4 5NPV-5</p> <p>5NF-1 5NF-2</p> <p>Formative assessment questions - <i>key questions to support pupil reasoning and teacher assessment</i></p> <ul style="list-style-type: none"> • What is the same and what is different? • What if I change...? • Can you give me an example of... and another...and another? • Which is harder and which is easier...? • If I know this, then what else do I know?

Visual coding: key representations



1 hour + 20min + 5 min = 1 hour and 20 minutes
or 80 minutes

Distance in km expressed as a fraction	Distance in km expressed as a decimal fraction	Distance in metres
$\frac{1}{5}$ km	0.2km	200m
$\frac{1}{4}$ km	0.25km	250m
$\frac{1}{2}$ km	0.5km	500m
$\frac{3}{4}$ km	0.75m	750m
$\frac{1}{10}$ km	0.1km	100m
all other multiples of $\frac{1}{10}$ km, for example, $\frac{7}{10}$ km	0.7km	700m

$$2650\text{g} = 2.65\text{kg}$$

Ones				-ths		
1000s	100s	10s	1s	$\frac{1}{10\text{s}}$	$\frac{1}{100\text{s}}$	$\frac{1}{1000}$
2	6	5	0	●		
			2	●	6	5

$$3.56\text{kg} = 3560\text{g}$$

Ones				-ths		
1000s	100s	10s	1s	$\frac{1}{10\text{s}}$	$\frac{1}{100\text{s}}$	
			3	●	5	6
3	5	6	0	●		

$$5 \text{ miles} \approx 8 \text{ km}$$

$$\times 50 \quad \curvearrowright \quad 250 \text{ miles} \approx 400 \text{ km} \quad \curvearrowleft \quad \times 50$$

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Learning Journey – Measurement

Autumn unit 5.3 (2 weeks)	Spring unit 5.9 (2 weeks)	Summer unit 5.14 (2 weeks)
<p>I can read and write the time on an analogue and a digital clock (12-hour).</p> <p>I can read and write the time on an analogue and a digital clock (24- hour).</p> <p>I can convert time between analogue and digital 12- and 24- hour clocks.</p> <p>I can solve problems involving converting between units of time.</p> <p>I can find end times, start times, and durations of time.</p> <p>I can convert between different units of metric measure (length).</p> <p>I can convert between different units of metric measure (mass).</p> <p>I can convert between different units of metric measure (capacity and volume).</p> <p>I can estimate volume.</p> <p>I can understand and use approximate equivalences between metric units and common imperial units.</p>	<p>I can measure the perimeter of a rectilinear figure in centimetres and metres.</p> <p>I can calculate the perimeter of a rectilinear figure in centimetres and metres.</p> <p>I can measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres.</p> <p>I can find the area of rectilinear shapes by counting squares.</p> <p>I can calculate and compare the area of rectangles including squares.</p> <p>I can estimate the area of irregular shapes.</p> <p>I can convert between different units of metric measure.</p> <p>I can add and subtract amounts to money to give change.</p> <p>I can use all four operations to solve problems involving money.</p>	<p><i>Repeats in addition and subtraction learning journey</i></p> <p>I can use all four operations to solve problems involving length, using decimal notation, including scaling.</p> <p>I can use all four operations to solve problems involving mass, using decimal notation, including scaling.</p> <p>I can use all four operations to solve problems involving volume, using decimal notation, including scaling.</p> <p>I can use all four operations to solve problems involving money, using decimal notation, including scaling.</p> <p>I can solve problems involving converting between units of time.</p> <p>I can compare durations of events.</p>

Proposed lesson sequence to support development of mathematical concepts

Developing fluency and automaticity – ongoing daily practice

Mastering Key Facts in Key Stage 2	Autumn Ongoing Mental Fluency Practice <ul style="list-style-type: none"> • Number bonds and related number bonds to 1,000,000 • Addition by partitioning up to 4-digit numbers (e.g. 2235 + 1054) • Subtraction by partitioning up to 4-digit numbers (e.g. 9627 – 4015) • I can read roman numerals to 1000. • I can recognise years written in Roman numerals • Recall multiplication and division facts for multiplication tables up to 12 × 12
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I can...

Mathematical Concepts, Key Skills and Suggested Tasks

10 Sessions – Measurement

I can read and write the time on an analogue and a digital clock (12-hour).

An additional pre-teaching step may be needed to strengthen pupils' confidence in reading analogue clocks to the nearest minute with accuracy.

Pupils may be able to read and record 12-hour digital times with increasing accuracy, though this may still require consolidation to ensure consistency and fluency.

Reinforce that time is written using a colon (:) rather than a decimal point, as this distinction becomes increasingly important as pupils encounter decimals in later mathematics.

Begin by revisiting key times that pupils should already be secure with (for example, o'clock = 10:**00**, half past = 10:**30**, quarter past/to = 10:**15**/ 10:**45**), ensuring they confidently interpret the relationship between the hour and minute digits. Use this as an opportunity to check for and address any gaps in understanding. Gradually revisit more complex times, including those to the nearest minute, ensuring pupils can read, write and interpret them accurately.

Suggested tasks:

- Match analogue clocks with both 12-hour digital times
- Read a digital time and represent it on an analogue clock
- Read an analogue clock and record 12-hour digital times
- Order a set of 12-hour digital times (including a mix of a.m and p.m.)

Watch out for:

- Omitting the zero placeholder (e.g. writing 11:09 as 11:9)
- Confusing the hour and minute digits

I can read and write the time on an analogue and a digital clock (24- hour).

In Year 4, pupils were shown that afternoon and evening times can be found on a 24-hour digital clock by adding 12 to the hour.

Highlight patterns (e.g. 13 = 1 pm, 14 = 2 pm, 15 = 3 pm) to build confidence and reduce reliance on memorisation. For example, 3:00 pm in the 12-hour clock is written as 15:00 in the 24-hour clock (3 + 12 = 15).

Suggested tasks:

- Match analogue clocks with 24-hour digital times
- Read a digital time and represent it on an analogue clock
- Order a set of digital times.

Providing regular opportunities to move between representations and explain their reasoning will support pupils in developing fluency, accuracy and deeper understanding of digital time.

I can convert time between analogue and digital 12- and 24- hour clocks.

Use assessment to continue to strengthen connections between analogue, 12-hour digital and 24-hour digital time, supporting pupils to move flexibly between representations and explain how they know.

Each clock below shows the time in am or pm.
Match each clock to its 24-hour time.
One has been done for you.

12:35

04:05

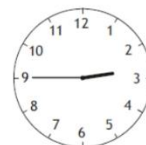
07:20

22:45

19:20

21:45

A clock shows this time twice a day.



Tick the two digital clocks that show this time.

03:45 02:45 09:45

21:45 14:45

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

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I can solve problems involving converting between units of time.

In Year 4, Unit 4.5 provided pupils with the opportunity to solve problems involving converting between units of time, using known multiplication facts.

- Hours to minutes
 - 2 hours = 2 groups of 60
 - $2 \times 60 = 120$ minutes
- Minutes to hours
 - 180 minutes = how many groups of 60?
 - $180 \div 60 =$
 - If I know $18 \div 6$ is 3, then I know that $180 \div 60 = 3$
 - $180 \div 60 = 3$ hours
- Minutes to seconds / seconds to minutes also involves groups of 60
- Years to months
 - 4 years = 4 groups of 12
 - $4 \times 12 = 48$ months
- Months to years
 - 36 months = how many groups of 12?
 - $36 \div 12 = 3$ years
- Weeks to days
 - 6 weeks = 6 groups of 7
 - $6 \times 7 = 42$ days
- Days to weeks
 - 77 days = how many groups of 7?
 - $77 \div 7 = 11$ weeks

Write the missing numbers in the table.

Number of weeks	Number of days
1	7
2	14
4	28
6	
10	
	105

Write the missing numbers.

60 months = years

72 hours = days

84 days = weeks

If pupils were confident in converting using the relevant times tables, they can use this to support flexible conversion between units of time, for example recognising that 250 seconds = 4 minutes (240 seconds) with 10 seconds remaining.

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I can find end times, start times, and durations of time.

This step may need to be explicitly taught over several lessons to ensure pupils develop secure understanding of calculating start times, end times, and durations. A number line should be used to support accurate calculations throughout.

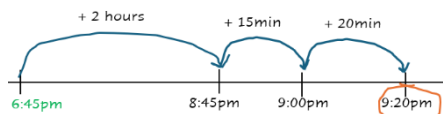
Reading and interpreting timetables will be taught explicitly in Unit 5.8.

See examples below:

Find end times:



A film starts at 6:45pm.
It lasts 2 hours and 35 minutes.
What time will the film finish?

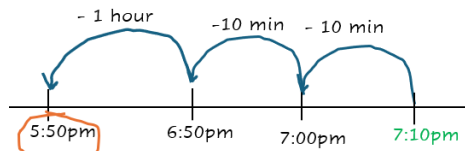


Find start times:

Amina went to a concert one evening.

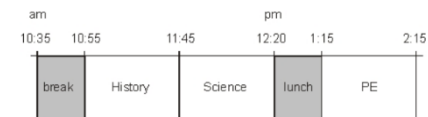


It took her an hour and twenty minutes to get there from home.
She arrived at ten past seven.
At what time did she leave home?

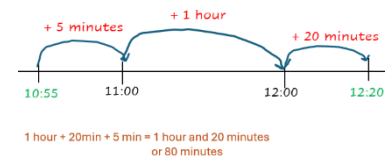


Find durations of time:

Here is part of the timetable for Class 6 on a Monday.



Look at the timetable.
How long is it from the **end** of break to the **start** of lunch?



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I can convert between different units of metric measure (length).

In Year 4, pupils converted between metres and centimetres, starting with a familiar form of recording, for example 1m 56cm.

- How many centimetres is this altogether?
- Model 1m = 100cm
- so 100cm + 56cm = 156cm

This can also be written as 1.56m.

When I convert centimetres to metres, I divide by 100 because 100cm = 1m. The digits move two places to the right because the value becomes 100 times smaller.

Pupils have not yet had sufficient practice converting between kilometres, metres, centimetres and millimetres. Provide opportunities for them to develop this skill using key conversion facts, alongside their growing confidence in multiplying and dividing by 10, 100 and 1000, as introduced in Unit 5.2.

156cm = 1.56m

Ones			-ths	
100s	10s	1s	$\frac{1}{10s}$	$\frac{1}{100s}$
1	5	6	●	
		1	●	5
				6

I can convert between different units of metric measure (mass).

In Year 4, pupils did not convert mass with decimals as this would involve thousandths. Pupils would have practised changing mixed units into a single unit, for example 3kg 500g into 3500g, reinforcing the key conversion fact of 1kg = 1000g.

Pupils also recalled known facts linked with fractional parts, for example $\frac{1}{2}$ kg = 500g, $\frac{1}{4}$ kg = 250g, $\frac{3}{4}$ kg = 750g, $\frac{1}{5}$ kg = 200g and $\frac{1}{10}$ kg = 100g.

Building on from the previous step, and learning from unit 5.2, pupils can now convert mass using decimal places.

When I convert grams to kilograms, I divide by 1000 because 1000g = 1kg. The digits move three places to the right because the value becomes 1000 times smaller.

When I convert kilograms to grams, I multiply by 1000 because 1000g = 1kg. The digits move three places to the left because the value becomes 1000 times larger.

2650g = 2.65kg

Ones				-ths		
1000s	100s	10s	1s	$\frac{1}{10}$ s	$\frac{1}{100}$ s	$\frac{1}{1000}$ s
2	6	5	0			
			2	6	5	

3.56kg = 3560g

Ones				-ths		
1000s	100s	10s	1s	$\frac{1}{10}$ s	$\frac{1}{100}$ s	$\frac{1}{1000}$ s
			3	5	6	
3	5	6	0			

I can convert between different units of metric measure (capacity and volume).

Similarly to the previous step, pupils have only experienced changing mixed units into a single unit, for example 4l 250ml into 4250ml, reinforcing the key conversion fact of 1l = 1000ml.

Pupils also recalled known facts linked with fractional parts, for example $\frac{1}{2}$ l = 500ml, $\frac{1}{4}$ l = 250ml, $\frac{3}{4}$ l = 750ml, $\frac{1}{5}$ l = 200ml and $\frac{1}{10}$ l = 100ml.

Introduce decimal conversion, using the same place value knowledge of multiplying and dividing by 1000 as in the previous step.

When I convert millilitres to litres, I divide by 1000 because 1000ml = 1l. The digits move three places to the right because the value becomes 1000 times smaller.

When I convert litres to millilitres, I multiply by 1000 because 1000ml = 1l. The digits move three places to the left because the value becomes 1000 times larger.

7500ml = 7.5l

Ones				-ths		
1000s	100s	10s	1s	$\frac{1}{10}$ s	$\frac{1}{100}$ s	$\frac{1}{1000}$ s
7	5	0	0			
			7	5		

5.45l = 5450ml

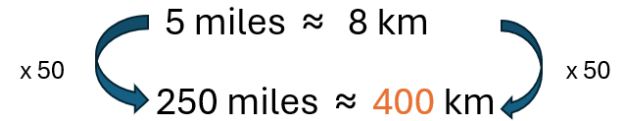
Ones				-ths		
1000s	100s	10s	1s	$\frac{1}{10}$ s	$\frac{1}{100}$ s	$\frac{1}{1000}$ s
			5	4	5	
5	4	5	0			

<p>I can estimate volume.</p>	<p>Use assessment of pupils' confidence with volume and capacity to determine whether this step may be more effectively split across several lessons to ensure pupils develop secure understanding.</p> <p>Pupils should first estimate the volumes of different objects by using cubes with a volume of 1 cm³ and building a shape similar to the given 3D object. Provide pupils with cubes and ask them to estimate the volumes of objects found in the classroom. For example, they could estimate the volume of a water bottle by constructing a similar-sized cuboid using interlocking cubes. For each object, discuss whether the actual volume is greater or less than their estimate. Support pupils in using known multiplication facts to calculate volume by multiplying height × width × length.</p> <p>Pupils then move on to considering the volumes of much larger objects, such as rooms. They discuss why cubic centimetres would be inappropriate for measuring larger volumes and explore the need for different units, such as cubic metres.</p> <p>Pupils then progress onto exploring the capacity of different objects. Pupils should already be aware of the distinction between capacity and volume from earlier learning: for example, the capacity of a jug is how much liquid it can hold, whereas volume refers to how much liquid is actually inside it. They should also understand that the term "capacity" is most commonly used when referring to liquids.</p> <p>Spend time showing pupils containers of different sizes, discussing the capacity of each, and matching capacities to the correct containers. Using familiar examples, such as a 330 millilitre can and a 2-litre bottle, will support pupils in estimating the capacity of unknown containers. They can then go on to estimate the capacity of a container when a known quantity is already inside it.</p>
<p>I can understand and use approximate equivalences between metric units and common imperial units.</p>	<p>In this step, pupils are introduced to imperial measurements for the first time. Unlike metric measures, which are based on powers of 10 and are therefore easy to convert (e.g. 10 mm = 1 cm, 100 cm = 1 m), imperial measures do not follow a consistent pattern. Imperial measures are traditional units that originated in Britain and are still partly used in the UK and some other countries. Begin by asking pupils to share any units of measure they already know that are not metric. This provides an opportunity to explore and group imperial units into categories:</p> <ul style="list-style-type: none"> • Length: inches, feet, yards, miles • Mass: ounces, pounds, stones • Capacity/Volume: pints, quarts, gallons <p>Encourage pupils to recognise that these units measure the same types of things as metric units, but in a different system.</p> <p>Demonstrate how to convert between metric units and common imperial units, such as miles and kilometres, inches and centimetres, feet and centimetres and litres and gallons. Give pupils the approximate conversion, using the symbol '≈' to show 'approximately equal to'.</p>

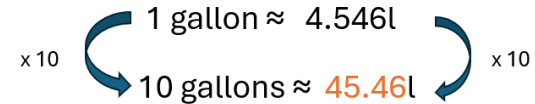
Example questions:



The International Space Station orbits the Earth at a height of 250 miles.
 What is the height of the International Space Station in **kilometres**?
 Use 8 kilometres equals 5 miles.



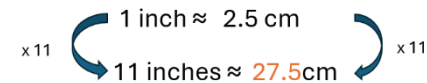
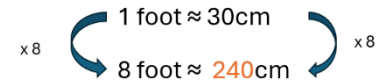
1 gallon is 4.546 litres.
 How many litres are needed to fill a 10 gallon tank?



The height of the tallest person in history is 8 feet 11 inches.

Conversion table	
One foot	30 centimetres
One inch	2.5 centimetres

Use this conversion table to calculate the height of the tallest person, in **centimetres**.



2.5cm x 11 could be worked out by multiplying by 10 and adding one group of 25.

240cm + 27.5cm = 267.5cm

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HIAS Resources to support:

- Reasoning and Intelligent Practice Tasks: [Reasoning and Intelligent Practice Tasks](#)
- Faded Scaffolds and Intelligent Practice: [Faded Scaffolds and Intelligent Practice](#)
- Paired Examples: [Paired Examples](#)
- Entry and Exit tickets: [Entry and Exit Tickets](#)
- Interleaving, Recall and Retrieval: [Interleaving, Recall and Retrieval \(hants.gov.uk\)](#)
- Connect4Maths: [Connect4Maths - Primary](#)
- Moderation Documents: [Moderation Documents](#)
- KS1 Key Facts: [Key Stage 1 Key Facts Document](#)
- Mastering Times Tables: [Mastering Times Tables](#)

NCETM Resources to support:

- Exemplification of ready -to -progress criteria (RTPS): [Exemplification of ready-to-progress criteria | NCETM](#)
- NCETM Professional Development materials spine 1: [Number, Addition and Subtraction | NCETM](#) ;
- The NCETM Mastery Task booklets can be used as a source of tasks to support end of year teacher assessment for both EXS and GDS [Teaching for Mastery Booklets Yr1-6](#)

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