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Year 6

Small Steps Guidance and Examples

Block 4 – Converting Units



Year 6 – Yearly Overview

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number- Place Value		Number- Addition, Subtraction, Multiplication and Division				Fractions				Geometry- Position and Direction	Consolidation
Spring	Number- Decimals		Number- Percentages		Number- Algebra		Measurement Converting units	Measurement Perimeter, Area and Volume		Number- Ratio		Consolidation
Summer	Geometry- Properties of Shapes		Problem solving			Statistics		Investigations				Consolidation

Overview

Small Steps



NC Objectives

Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.

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 3dp.

Convert between miles and kilometres.

Metric Measures

Notes and Guidance

Children read, write and recognise all metric measures for length, weight and capacity.

They develop their estimation skills in context and decide when it is appropriate to use different metric units of measure.

Mathematical Talk

Which is the most appropriate unit to use to measure the object?

Why do you think ____ is not an appropriate estimation?

Varied Fluency

- 1 Choose the unit of measure that would be the most appropriate to measure the items.

cm kg km g tonnes ml mm litres

- The weight of an elephant
- The volume of water in a bath
- The length of an ant
- The length of a football pitch
- The weight of an apple

- 2 Estimate how much juice the glass holds:



250 ml 2 litres 0.5 litres $\frac{1}{2}$ kg

- 3 Estimate the height of the door frame:

20 mm 20 cm 20 m 2 km 2 m 0.2 km

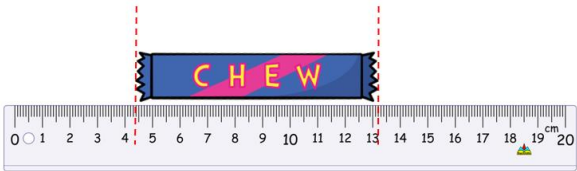


Metric Measures

Reasoning and Problem Solving

Sam thinks his chew bar is 13.2 *cm* long.

Do you agree? Explain why.



Sam is wrong because his chew bar doesn't start at zero, it is actually 8.8 cm long.

Here is a train time table showing the arrival times of the same trains to Halifax and Leeds:

Halifax	Leeds
07:33	08:09
07:49	08:37
07:52	08:51

An announcement states all trains will arrive $\frac{3}{4}$ of an hour late.
Which train will get into Leeds the closest to 09:07?

The 07:33 train from Halifax which will arrive in Leeds at 08:54

Convert Metric Measures

Notes and Guidance

Children will use their skills of multiplying and dividing by 10, 100 and 1,000 when converting between units of length, mass and capacity.

Children will convert in both directions for example: from grams to kilograms and vice versa.

They will convert where the number of decimal places given varies and understand the role of zero as a place holder.

Mathematical Talk

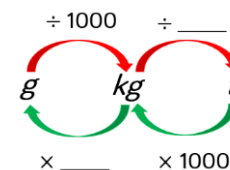
How could you work out what each mark is worth on the scales?
What do you think would be the most efficient method for converting the units of time?

What's the same and what's different between 1.5 km and 1.500 km? Are the 0s needed, why?

What do you notice about the amounts in the table, can you spot a pattern?

Varied Fluency

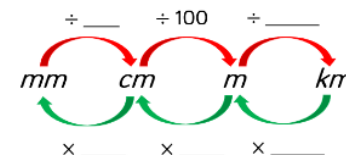
- 1 There are grams in one kilogram.
There are kilograms in one tonne.
Use these facts to fill in the blanks:



g	kg
1,500	
	2.05
1,005	

kg	tonnes
1,202	
	4.004
125	

- 2 There are mm in one centimetre.
There are cm in one metre.
There are m in one kilometre.
Use these facts to fill in the blanks:



mm	cm	m	km
44,000			
	2,780		
		15.5	
			1.75

Convert Metric Measures

Reasoning and Problem Solving

True or false?

If you convert any amount of grams to kilograms, then it will never have a digit in the ones column. E.g. $76\text{ g} = 0.076\text{ kg}$

False because
1,001 g would be
1.001 kg etc.

Sort the lengths of time from shortest to longest.

360 minutes

270 seconds

72 hours

$\frac{1}{14}$ fortnight

$\frac{1}{2}$ day

5,760 minutes

270 seconds
360 minutes
 $\frac{1}{2}$ day
 $\frac{1}{14}$ fortnight
72 hours
5,760 minutes

A shop sells litre bottles of water for 99 *p* each.

300 *ml* bottles of water are on offer for 8 for £2

If Jess wants to buy 12 *L* of water for the cheapest amount, which should she buy and why?

£11.88 to buy 12
one litre bottles

£10 to buy 5 lots
of the offer.

Jess should buy 40
bottles of 300 *ml*
(5 lots of the offer)

Calculate with Metric Measures

Notes and Guidance

Children use and apply their conversion skills and all four operations to solve measurement problems in context.

They use a bar model to represent the problem and help them decide which operation to use.

Mathematical Talk

What operation are you going to use and why?

Can you use a bar model to help you understand the question?

How many ___ are there in a ___?

Varied Fluency

- 1 A tube of toothpaste holds 75 *ml*

How many tubes can be filled using 3 litres of toothpaste?



- 2 A parcel weighs 439 grams. How much would 27 parcels weigh? Give your answer in kilograms.



- 3 To bake buns for a party, Keeley used these ingredients:

- 600 g caster sugar
- 0.6 kg butter
- 18 eggs (792 g)
- $\frac{3}{4}$ kg self-raising flour
- 10 g baking powder




What is the weight of the unbaked products?
Give your answer in kilograms.

Calculate with Metric Measures

Reasoning and Problem Solving

<p>Dominic, Emma and Annabelle jumped a total of 34.77 m in a long jump competition.</p> <p>Emma jumped exactly 200 cm further than Dominic.</p> <p>Annabelle jumped exactly 2,000 mm further than Emma.</p> <p>What distance did they all jump? Give your answers in metres.</p>	<p>Dominic jumped 9.59 m</p> <p>Emma jumped 11.59 m</p> <p>Annabelle jumped 13.59 m</p>
<p>Hamid made a stack of his collection of fishing magazines. Each magazine on the pile 2.5 mm thick. The total height of the stack was 11.5 cm high. How many magazines did he have in his pile?</p>	<p>There are 46 magazines in Hamad's pile.</p>

<p>Each nail weight 3.85 g</p> <p>There are 24 nails in a packet.</p> <p>What would the total mass of 60 packets be in kilograms?</p> <p>How many packets would you need if you wanted $\frac{1}{2}$ kg of nails?</p> <p>How many grams of nails would be left over?</p>		<p>5.544 kg</p> <p>6 packets (554.4 g)</p> <p>55.4 g left over</p>
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Miles and Kilometres

Notes and Guidance

Children should understand that 8 km is approximately 5 miles and use this fact to calculate 1 km in miles and vice versa.

This knowledge can then be applied in context using children's calculation skills.

Mathematical Talk

What might we measure in miles or kilometres?

Where might you see this in real life?

Can you think of a situation where you may need to convert between miles and kilometres?

Varied Fluency

1

5 miles \approx 8 kilometres

Use this fact to complete:

- 15 miles \approx km
- 30 miles \approx km
- miles \approx 160 km

2

If 10 miles is approximately 16 km, 1 mile is approximately kilometres.

- 2 miles \approx km
- 4 miles \approx km
- 0.5 miles \approx km

3

In the United Kingdom, the maximum speed limit is 70 miles per hour (mph). In France, the maximum speed limit is 130 kilometres per hour (kph).

Which country has the higher speed limit and by how much?



Miles and Kilometres

Reasoning and Problem Solving

Josh and Lucas are running a 5 mile race.

I have ran 6.4 km so far.



I have ran 3.8 miles so far.

Who has the furthest left to run?

Josh has 1 mile left to run, whereas Lucas has 1.2 miles left to run. Lucas has the furthest left to run.

Raj cycles 45 miles over the course of 3 days.

On day 1, he cycles 16 km

On day 2, he cycles 10 miles further than he did on day 1

How far does he cycle on day 3?

Give your answer in miles and in kilometres.

On day 1 he cycles 16 km / 10 miles

On day 2 he cycles 32 km / 20 miles

On day 3 he cycles 24 km / 15 miles

Imperial Measures

Notes and Guidance

Children recap common imperial measures.

Children should understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints.

Mathematical Talk

Which is bigger: cm, mm, inch, foot or a metre?
How do you know?

When do you see imperial measures being used on a daily basis?

Varied Fluency

1

2.5 cm \approx 1 inch
1 foot = 12 inches

Use this fact to complete:

2 feet = inches

6 inches \approx cm

feet = 36 inches

4 feet \approx cm

2

1 pound (lb) = 16 ounces
1 stone = 14 pounds

Use this fact to complete:

2 lbs = ounces

5 stone = lbs

lbs = 320 ounces

stones = 154 lbs

3

If one gallon is equivalent to 8 pints,

- How many gallons are equivalent to 64 pints?
- How many pints are equivalent to 15 gallons?
- How many gallons are equivalent to 2 pints?

Imperial Measures

Reasoning and Problem Solving

David is 6 foot 2 inches tall.

Annabelle is 162 cm tall.

Who is taller and by how much?

David is 185 cm tall, he is 23 cm taller than Annabelle.

Kate wants to make a cake.

Here are some of the ingredients she needs:

- 8 ounces of caster sugar
- 6 ounces of self-raising flour
- 6 ounces of butter

This is what Kate has in her cupboards:

- 0.5 lbs of caster sugar
- 0.25 lbs of self-raising flour
- $\frac{3}{8}$ lbs of butter

Does Kate have enough ingredients to bake the cake?



Kate has the exact amount of butter and caster sugar, but does not have enough self-raising flour.