Reasoning and Problem Solving
Step 1: Metric Measures

National Curriculum Objectives:

Mathematics Year 6: (6M5) 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
Mathematics Year 6: (6M9) Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate

Differentiation:

Questions 1, 4 and 7 (Reasoning)
Developing Assign and explain units of metric measurement within a given context. Use of whole numbers.
Expected Assign and explain units of metric measurement within a given context. Use of whole numbers and some decimals and fractions.
Greater Depth Assign, explain and estimate units of metric measurement within a given context. Use of whole numbers, decimals and fractions.

Questions 2, 5 and 8 (Reasoning)
Developing Explain which statement is the best estimation in a given measuring context. Use of whole numbers.
Expected Explain which statement is the best estimation in a given measuring context. Use of whole numbers and some decimals and fractions.
Greater Depth Explain which statement is the best estimation in a given measuring context. Use of whole numbers, decimals and fractions. Some square and cube numbers included.

Questions 3, 6 and 9 (Problem Solving)
Developing Estimate metric measurements by using the information provided. Use of whole numbers.
Expected Estimate metric measurements by using the information provided. Use of whole numbers and some decimals and fractions.
Greater Depth Estimate metric measurements by the information provided. Use of whole numbers, decimals and fractions.

More Year 6 Converting Units resources.

Did you like this resource? Don't forget to review it on our website.

Metric Measures

1a. Millie is measuring the distance that her friends have walked around the playground.

Hafsa	1	
Luke	880	

She has forgotten to write the unit of measurement.

Which unit of measure could she be using for each distance? Convince me.

D R

Metric Measures

1b. Joseph is measuring the length of his classmates' pencil cases and recording his results.

Jack	30	
Lucy	400	

He has forgotten to write the unit of measurement.

Which unit of measure could he be using for each length? Convince me.

D R

2a. The children are estimating how much water is needed to fill a paddling pool.

Tracy: I think it will be around 30ml.

Jaxon: I think it will be around 30L.

Who do you agree with and why?

D R

2b. The children are estimating how heavy a book is.

Ethan: I think it will be around 20g.

Isobel: I think it will be around 2kg.

Who do you agree with and why?

D R

3a. A pencil is approximately 20cm in length. Estimate the lengths for the following:

a table leg	
a pencil case	
a water bottle	
a rubber	

D PS

3b. A tennis ball weighs approximately 60g. Estimate the weights for the following:

a football	
a golf ball	
a bouncy ball	
a cricket ball	

D PS

Metric Measures

4a. Terrie is measuring the length of her classmates' arms and recording her results.

Jenny	0.3	
Gerry	400	
Jonah	38	

She has forgotten to write the unit of measurement.

Which unit of measure could she be using for each length? Convince me.

E R

Metric Measures

4b. Max is measuring the volume of his classmates' water bottles and recording his results.

Iqra	500	
Will	0.8	
Jake	1	

He has forgotten to write the unit of measurement.

Which unit of measure could he be using for each volume? Convince me.

E R

5a. The children are estimating how much water is needed to fill a bath.

Susie: I think it will be around 115.5ml.

Jojo: I think it will be around 115.5L.

Who do you agree with and why?

E R

5b. The children are estimating how heavy their school desk is.

Jaiden: I think it will be around 25kg.

Isaac: I think it will be around $25\frac{1}{2}$ g.

Who do you agree with and why?

E R

6a. An apple weighs approximately 85g. Estimate the weights for the following:

a grape	
a pineapple	
a watermelon	
an orange	

E PS

6b. A cat is approximately 50cm in length. Estimate the lengths for the following:

a cow	
a mouse	
a pig	
a sheep	

E PS

Metric Measures

7a. Robyn is measuring how far her classmates can jump.

Ellie	2.1	
Martha		cm
Jake		m

What unit of measure is missing?

Estimate the missing measurements, and convince me that these are accurate estimates.

GD R

8a. The children are estimating the area of a wall.

Safeeyah: I think it will be around 80m^2.

Pippa: I think it will take around 80m^3.

Who do you agree with and why?

GD R

9a. A door is approximately 2m in height. Estimate the heights for the following:

2 pens	
a chair	
a teacher	
2 water bottles	

GD PS

Metric Measures

7b. Erin is measuring the weight of her classmates' lunch boxes.

Connor	0.5	
Bradley		kg
Alex		g

What unit of measure is missing?

Estimate the missing measurements, and convince me that these are accurate estimates.

GD R

8b. The children are estimating the length of the playground.

Felix: I think it will be around a tenth of a kilometre.

Yusuf: I think it will be around 100m.

Who do you agree with and why?

GD R

9b. A bottle of pop has a capacity of approximately 1.5L. Estimate the capacities for the following:

a glass of water	
a cup of tea	
a kettle	
a small carton of juice	

GD PS

Reasoning and Problem Solving
Metric Measures

Developing

1a. Various answers, for example:
1km, 880m. Each is around the same distance and both are plausible distances for children to walk.

2a. Various answers, for example:
I agree with Jaxon because litres is a greater measure of volume than millilitres. In context, 30ml wouldn't fill a cup, so much more water would be needed to fill a paddling pool.

3a. Various answers, for example:
a table leg – 1m, a pencil case – 30cm, a water bottle – 50cm, a rubber – 5cm.

Expected

4a. Various answers, for example:
0.3m, 400mm, 38cm. Each is around the same length when converted to the same unit, and children in one class would have similar length arms.

5a. Various answers, for example:
I agree with Jojo because a bath requires a large amount of water to fill it, and litres is a greater measure than millilitres. In context 150ml is about half of a small glass of water.

6a. Various answers, for example:
a grape – 5g, a pineapple – 1kg, a watermelon – 8kg, an orange – 100g.

Greater Depth

7a. Various answers, for example:
2.5m. The missing measurements could be: Martha – 200cm, Jake – 2.2m. These are accurate estimates because each is around the same height, which would be plausible for children in the same class.

8a. Various answers, for example:
I agree with Safeeyah because she has used the correct unit of measurement for area; Pippa's use of m^3 refers to volume, not area.

9a. Various answers, for example:
2 pens – 40cm, a chair – 0.5m, a teacher – 1.5m, 2 water bottles – 60cm.

Reasoning and Problem Solving
Metric Measures

Developing

1b. Various answers, for example:
30cm, 400mm. Each is around the same length and both are plausible lengths for pencil cases.

2b. Various answers, for example:
I agree with Isobel because kilograms is a greater measure of weight than grams. In context, 20g is about the weight of a AA battery, so would be too light for the weight of a book.

3b. Various answers, for example:
a football – 400g, a golf ball – 50g, a bouncy ball – 10g, a cricket ball – 160g.

Expected

4b. Various answers, for example:
500ml, 0.8 litres, 1 litre. Each is around the same volume when converted to the same unit of volume, and children will have similar sized water bottles.

5b. Various answers, for example:
I agree with Jaiden because the weight of a table would be measured in kilograms rather than grams. In context, 25g weighs less than a slice of bread.

6b. Various answers, for example:
a cow – 2.5m, a mouse – 10cm, a pig – 1.8m, a sheep – 1.5m.

Greater Depth

7b. Various answers, for example:
0.5kg. The missing measurements could be: Bradley – 0.8kg, Alex – 750g. These are accurate estimates because each is around the same weight, which would be plausible for children in the same class.

8b. Various answers, for example:
I agree with both Felix and Yusuf because 0.1km and 100m are equal distances to one another.

9b. Various answers, for example:
a glass of water – 500ml, a cup of tea – 450ml, a kettle – 1L, a carton of juice – 250ml.