

Year 5 Maths No Problem Teaching Guidance to go with online Maths No Problem lessons

Chapter 11 Measurement - Overview

In this chapter, pupils are exploring the measurement of mass, temperature, time and length. The chapter begins with pupils converting units of length from millimetres to centimetres and from centimetres to metres. They quickly move on to converting metres to kilometres before looking at converting imperial measures to metric measures. Pupils explore converting units of mass in the same manner, finishing with imperial and metric conversions. They look at units of time in days, weeks, months and years, then in seconds, minutes and hours. The last lesson looks at temperature and how to use a vertical number line (thermometer). The chapter ends with a very challenging problem about changing lengths.

Lesson 1: Converting Units of Length

To begin this lesson, show pupils the In Focus task and give them some time to read and think about the problem. What is the task asking us to do? How will we measure the three characters? We need to measure them in 'mm'. What does mm stand for? Lead pupils towards talking about millimetres and thinking about how small a millimetre is. What things would we measure in millimetres?

Provide pupils with rulers and ask them to measure the heights of the characters in millimetres. Then ask them to check if the problem is completely solved. Is there anything else we need to do? Allow them time to identify that they also need to find out the height of the characters in centimetres. What does 'cm' stand for? Are centimetres greater than or less than millimetres?

Tell pupils that there are 100 mm in a centimetre. So the first cartoon is less than 1 cm tall. Is this correct? Guide pupils to realise that 10 mm is equal to 1 cm. How do we represent 1 mm in centimetres? Can we use a decimal? Give pupils time to identify 1 mm and 0.1 cm. What would 5 mm be in centimetres? Allow pupils time to think about the problem and make connections. So what will the first character's height be? Tell them that the second and third characters' heights will be more difficult to write in centimetres because they are not multiples of 10. What does that mean? Work through Let's Learn to show the class how to convert millimetres to centimetres.

During Guided Practice, pupils are measuring the sides of a triangle in centimetres, and converting centimetres to millimetres and millimetres into centimetres.

Lesson 2: Converting Units of Length

To begin this lesson, show pupils the In Focus task and allow them some time to read and work through the problem. What is the man in the picture doing? How high do you think he is jumping? Do we need to measure how high he is jumping to solve this problem? Look at the records for the vaults over the years. Which person do you think has the record? Why is it difficult to find out? Give pupils time to see that two of the records are measured in centimetres and one is measured in metres. How can we make all of the units the same? Ask them to think about the problem and try some conversions.

Ask pupils if it is true that there are 100 cm in a metre. If so, how would we show 500 cm? Is it possible? Lead pupils to see that 500 divided by 100 is 5. Ask them to look at Renaud Lavillenie's record from 2014. How many metres did he jump? Remind them to think about how many hundreds are in 616. How much is left? Tell pupils that 10 cm is 1 tenth of a metre. How would you show this as a decimal? Give them time to work this out. Does this mean that 1 cm is 1 hundredth of a metre? How would you show this as a decimal? How much more than 6 m is 616 cm? Would it be possible to convert 5.80 m into centimetres? How many

centimetres are there in 5 metres? How many centimetres are equivalent to 0.80 of a metre? Use Let's Learn to work through these conversions.

During Guided Practice, pupils are converting centimetres to metres and centimetres, and to metres in decimal form. They need to understand that 100 cm is 1 m, 10 cm is 1 tenth of a metre (written as 0.1 m) and 1 cm is 1 hundredth of a metre (written as 0.01 m).

Lesson 3: Converting Units of Length

To begin this lesson, show pupils the In Focus task and give them some time to solve the problem. Ask them what information is given. What do you think we might need to do? Do we need to convert these lengths into the same unit of measurement to solve this problem? What does 'convert' mean? What is a unit of measurement? How would we convert these lengths? Allow pupils time to work on this. Then ask them to which measurements they converted the lengths and why. Can we convert the lengths more than one way? How can we show the lengths in kilometres and metres? Would we need to change them all?

Ask pupils if they agree that there is 1000 m in 1 km. If there are 1000 m in a kilometre does that help us change 4009 m into kilometres and metres? What does 0.9 km mean? (900 metres.) Can we show 4.09 km in metres? What would 4 km and 90 m be in kilometres? How would you write 90 m in kilometres? Ask them if they agree that 10 m is the same as 0.01 km. How many times does 10 go into 1000? Would that help us convert 90 m into kilometres? Would it be possible to convert all of these lengths just into metres? What would that look like? Use Let's Learn to work through these conversions.

During Guided Practice, pupils are continuing to convert measurements of length into kilometres, metres, and kilometres and metres.

Lesson 4: Converting Units of Length

To begin this lesson, show pupils the In Focus task and allow them some time to read the problem and think about what they need to do to solve it. Can we help Emma find out if she can carry her bag on board on either of these flights? Does the weight of the bag pose a problem? What is the main problem? Why is this hard to understand? What is different about the dimensions? Give them a little time to start working through the problem.

If we round 1 inch to 2.5 cm, it might make it easier to solve this problem. What do you think? Give pupils time to think and respond. How do we work out the length, width and height of Emma's bag? Lead pupils towards multiplying each of the measurements by 2.5. If 1 inch is 2.5 cm, how many centimetres are there in 2 inches? 4 inches? 8 inches? 10 inches? Does this help us? Help pupils to check and compare the newly-converted dimensions with the Singapore Airlines and Ryanair requirements. Use Let's Learn to work through the conversions and discuss whether Emma's bag will be allowed on both flights.

During Guided Practice, pupils are converting feet to inches and inches to centimetres then metres. Once conversions have been made they will need to compare heights and distances.

Lesson 5: Converting Units of Mass

To begin this lesson, show pupils the In Focus task and give them some time to solve the problem. What do we need to do to answer this question? What have the coins been placed on? We have to find the mass of the coins. What does 'mass' mean? Is it the same as 'weight'? How do we know this has something to do with weight? Are there any other clues?

Draw pupils' attention to the use of the units of measurement: grams and kilograms. What do we know about grams and kilograms? How many grams are in a kilogram? Does it help to know what 100 g is in kilograms? Can we work that out? How many times does 100 g go into 1 kg? Can we write that as a fraction and as a decimal? What about 10 g? How many times does 10 g go into 1 kg? Can we write this as a fraction and as a decimal? If $10\text{ g} = 0.01\text{ kg}$, does that help us find 60 g? Lead pupils to see that $60\text{ g} = 0.06\text{ kg}$. Then ask them if it is possible to work out what 0.6 kg would be in grams. Use Let's Learn 1 to show the class the connection between the units.

Ask pupils if it might be helpful if we know what 1 tenth of 1 kg is. What is 1 tenth? Why is it called 1 tenth? Is 1 tenth of a kilogram easy to find? How many tenths are there in 0.6 kg? Lead pupils to see that if 0.1 kg is 100 g, 0.6 kg must be 600 g. Ask them if it is possible to work out how many £2 coins would weigh 600 g. How can we work this out? Can we find the mass of one £2 coin?

During Guided Practice, pupils are converting grams to kilograms, and reading scales and writing mass in kilograms as decimal numbers.