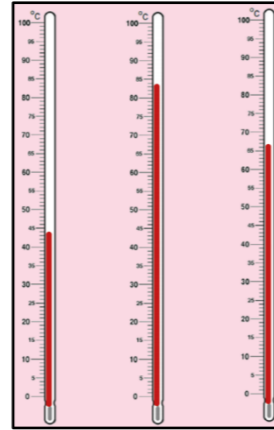


Year 2 Unit 13: Measuring capacity and volume (2 weeks)

Before you start...

- What prior knowledge do your pupils hold about the concepts of capacity and volume from Y1?
- Are pupils already confident in measuring, recording and describing capacity or does this need consolidating prior to starting this unit?
- How familiar are pupils with vocabulary such as increasing/decreasing?



Scaly issues

Pupils can find reading scales and calculating intervals challenging. Allow lots of time to explore different scales and unpick strategies for identifying intervals. These include:

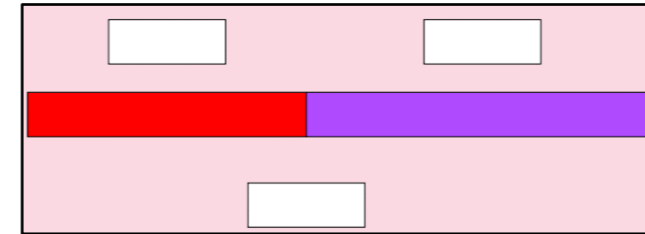
- Trial and improvement
- Division (total difference by number of intervals)

Regularly returning to a range of scales with missing intervals in Maths Meetings keeps this skill on the boil.

The power of conjectures

When looking at capacity, it is crucial at every opportunity to facilitate pupils estimating, predicting and reasoning. Getting them to reason as to why they believe one object would hold more and then test that hypothesis can be powerful.

Great starting questions to promote further mathematical thinking are 'How do you know?', 'Will that always happen?' and 'If we know that, what else do we know?'.



Reading and interpreting temperature in degrees Celsius

- L1 Read temperature in degrees Celsius on a thermometer
- L2 Take and read the temperature in degrees Celsius

Pupils practise reading a variety of scales, where intervals are not always in ones. They apply their understanding of scale reading in both pictorial examples and practically using thermometers. They then go on to use addition and subtraction to compare changing temperatures from different scales.

- ? To what extent have pupils been given opportunities to experience a range of scales, in differing forms (vertical, horizontal, curved)?
- ? What strategies for reading intervals will you model and explore with pupils? How can these approaches be scaffolded for all pupils to access them?

Solving capacity problems involving litres

- L3 Understand the concept of litres through estimating and measuring
- L4 Solve word problems that involve litres

Pupils use practical measuring to be able to estimate the capacity of objects with a one litre bottle as the base point. Pupils use their knowledge of capacity to then solve word problems, encouraging them to 'make sense' of the problems through thinking aloud and the creation of basic bar models.

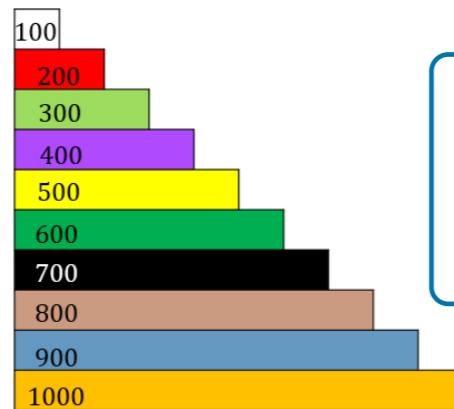
- ? How will your own modelling and thinking aloud support pupils to develop using bar modelling as a tool for thinking?
- ? How can those pupils comfortable with estimation in integers be further challenged – e.g. making connections to fractions?

Choosing your words

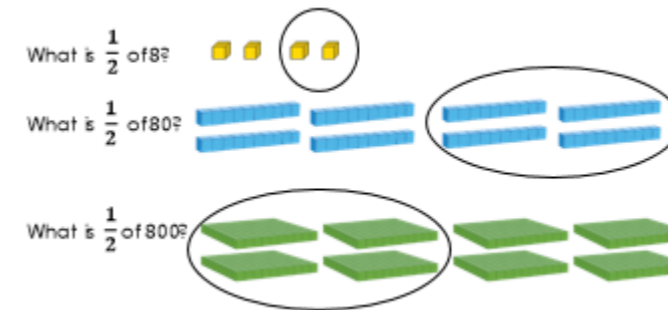
It is important from the first time they are introduced, to be clear on vocabulary's meaning...

Volume vs Capacity: Volume is a quantity or amount of any substance and the 3-D space it fills.

Capacity is the amount of liquid a container can hold. 'The bottle contains a volume of one litre but its capacity is two litres. The bottle is half full.'



Before using a manipulative that pupils are not so familiar with, it may be a good idea to provide opportunities for them to build confidence and familiarity in that resource. For example, in the days prior to using Cuisenaire Rods you may want to make some time in Maths Meetings to exploring the rods.



There is one consolidation lesson within the unit. You may wish to consider which lessons might benefit from being stretched over two lessons. For example, if pupils have not experienced bar models before, using it to explore this in more depth may be beneficial.

Applying knowledge of capacity and volume to wider problems

- L8 Apply number bonds and derive related facts to 1000
- L9 Solve word problems involving capacity and volume

Pupils use Cuisenaire rods to enable them to represent and explore number bonds to 1000 and related facts. They then apply these number bonds when solving capacity word problems. Pupils unpick how they can use 'what is known and unknown' to create bar models as a tool for understanding.

- ? Where are there opportunities for pupils confident in this to further develop their mathematical thinking?
- ? How can pupils be supported in creating their own pictorial representations when solving word problems? Will some pupils need further structure or scaffolding?

Comparing and ordering millilitres and litres

- L5 Compare millilitres and litres using fractions
- L6 Use millilitres as a unit of measurement
- L7 Compare and order millilitres and litres

Pupils make connections between litres and millilitres, converting between them with increasing confidence. They then go on to using millilitres as a unit of measurement, drawing upon their existing knowledge of scales and intervals to support them. Pupils then apply their understanding of millilitres to order a range of measurements (including mixed measures), with the support of various representations.

- ? Which representations will enable pupils to make sense of the problems most efficiently? How will language support making sense of these representations?
- ? How are pupils able to use language and reasoning to be able to justify the ordering of measures? Can manipulatives support and prove this reasoning?