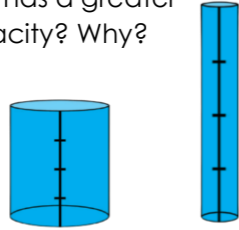


Year 1 Unit 16: Capacity and volume (2 weeks)

Before you start...

- To what extent have pupils embedded comparative language?
- What practical experiences have pupils had with volume and capacity?

Which container do you think has a greater capacity? Why?



The power of conjectures

When looking at capacity, it is crucial at every opportunity to facilitate pupils estimating, predicting and reasoning skills. Getting them to reason as to why they believe one object would hold more than another and testing their conjecture 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?'.

	empty
	nearly empty
	nearly full
	full
	half full
	one quarter full
	one quarter empty

Volume vs Capacity

It is important from the first time these words are introduced to be clear on their meaning...

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.'

Comparing capacities

- L1 Compare the capacity of two containers
- L2 Compare capacities using non-standard units

Pupils directly compare the capacities, by pouring material between different containers. They look to see whether material is left over in the first container to indicate that it has a greater capacity. They build on their understanding by using non-standard units to compare capacities. It is important to draw pupils' attention to the fact that a uniform non-standard unit of measure must be used if comparison is to be possible.

- ? What connections are there to previous experiences of measuring length and mass?
- ? What questions and/or prompts will you prepare to facilitate classroom dialogue?

Comparing volume

- L3 Compare different volumes

Pupils focus on comparing volumes, in containers of the same capacity. Pupils should be made aware that volume is the amount of space the material takes up, rather than the size of the container.

- ? How will you support pupils to use accurate mathematical language? (see above)
- ? What mathematical thinking will you model out loud to support pupils to compare and contrast?

Applying understanding of fractions

- L4 Apply understanding of halves and quarters to capacity

Pupils go on to experience halves and quarters in the context of capacity, where they learn to recognise that if four equal sized containers fill a larger container, each smaller container must have one quarter of the capacity of the larger container and so on.

- ? What sentence structures may be useful here to support pupils with articulating their reasoning?
- ? What representations might you use to support pupils in making connections to their previous learning on fractions?



Difference as a form of subtraction

This lesson [video](#) from the NCETM identifies some of the conceptual challenges of 'difference' in its mathematical sense, and the way in which pupils' understanding must be scaffolded in order for them to attach meaning to the concept.

There is one suggested consolidation lesson in this unit. You may consider using it to extend lesson 5 across two lessons, allowing pupils more time to explore the concept of one litre, half a litre and a quarter of a litre.

Using length, weight and volume

- L8 & 9 Apply understanding of measurement in a real life context

Pupils make gingerbread men, applying the skills they have learnt to measure accurately for a purpose.

- ? What are the key mathematical features do you wish to draw pupils' attention to?
- ? What prompts and questions will you use throughout the lesson to draw pupils' attention to the mathematical features you wish to focus on?

Exploring difference and distance between

- L6 & L7 Explore difference by comparing measures of length and volume

Pupils apply their measuring skills by competing to throw beanbags as far as possible and working in teams to transfer as much water as they can from one bucket to another. This sets up the context for finding difference, which is seen by looking at what is the same between two results, and what is different. Pupils represent their results using cubes, number lines and abstract equations, in order to find the difference.

- ? What representations and associated sentence structures will you use to support pupils' understanding of difference?

Using standard units of measure

- L5 Introduce a litre as a standard unit of measure

Pupils are introduced to a litre, which they see is conserved when poured between different containers. They link their knowledge of halves and quarters to one litre.

- ? What familiar representations of one litre might you share with pupils to support them in making connections to prior experiences?