Two Jug Puzzle

D2. Rename units of capacity in litres and millilitres and decimal or fraction form

You have two jugs.
One jug has a capacity of 5 litres and the other jug has a capacity of 3 litres.
Neither of the jugs has any markings.
You have an unlimited supply of water.
Can you measure exactly 4 litres of water using these jugs?

Could you draw a picture to help with this puzzle? Is there more than one way to solve the puzzle? In order to get four litre of water, how much water did you waste? How many refills from the taps, of the jugs, were involved in your solution? Can you convince a friend of your solution? Can you convince a sceptic? Could you create a new water problem using the 3 litre and 5 litre jugs?

- **Extension:** Given a 7 litre and a 3 litre jug, obtain exactly 5 litres.
- Given a 9 minute egg timer and a 5 minute egg timer. Show how to boil a 13 minute egg. Show how to boil an egg for any number of minutes.

Strand:	Measures
Strand unit:	Capacity
Assessment:	Teacher Observation, Pupil Learning Log, Pupil Portfolio, Teacher Questioning, Conferencing
Skill:	Applying and Problem Solving, Communicating and Expressing, Integrating and Connecting, Reasoning, Implementing

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Solutions

Fill up the 5 litre jug	Fill up the 3 litre jug
Fill up the 3 litre jug using the water from the 5 litre jug (leaving 2 litres in the 5 litre jug)	Transfer to the 5 litre jug
Empty out the 3 litre jug	Fill up the 3 litre jug again
Transfer the 2 litres from the 5 litre jug into the 3 litre jug	Transfer water to fill up the 5 litre jug, leaving 1 litre in the 3 litre jug
Fill up the 5 litre jug.	Empty out the 5 litre jug
Transfer water from the 5 litre jug until the 3 litre jug is full.	Transfer the 1 litre to the 5 litre jug
Since the 3 litre jug already had 2 litres of water, there is room for just 1 litre.	Fill up the 3 litre jug and transfer that to the 5 litre jug
The amount of water in the 5 litre jug is 4 litres	The 5 litre jug contains 4 litres of water