

# Game 4M4: Capacity

**Strand: Measures**

**Strand Unit: Capacity**

**Curriculum Objectives Covered:**

- Estimate, compare, measure and record capacity using appropriate metric units (l, ml) and selecting suitable instruments of measurement
- Rename units of capacity in l and ml
- Rename units of capacity using decimal or fraction form
- Solve and complete practical tasks and problems involving the addition, subtraction, multiplication and simple division of units of capacity (l, ml).

Name: “Guesstimation”

Aim: To estimate the capacities of various classroom objects and then measure the actual capacities. Guess as close as possible to win.

Activity Area: Classroom

Duration: 30 minutes

Resources:

- Whiteboard.
- A selection of everyday objects (one for each child in the class - see grid).
- Paper and pencils for teams to work out answers.
- 1 litre, 500ml and 250ml measuring containers (of different widths and heights) for each team
- Access to a water supply.

Set Up:

1. Before the game, the children should be shown volumes of 1 litre and 1 millilitre to help with their estimations. They should be shown, for example, a litre of milk to see 1 litre, and one drip from a tap to see approximately 1 millilitre.
2. The class should be split into equal sized teams of approximately 5 children per team.
3. The teacher projects/draws up the following type of grid onto the whiteboard. The list of objects should be relevant to the classroom environment.

Objects	Estimate	Rename estimate in l and ml	Actual capacity	Rename capacity in fractions or decimals (to 2 places)	Difference
Example: Capacity of lunchbox	1250ml	1l 250ml	1l 500ml	$1\frac{1}{2}l$	250ml
Capacity of an egg cup					
Capacity of a small milk carton					
Capacity of a large milk carton					
Capacity of a small cup					
Capacity of a mug					
Capacity of a milk jug					
Capacity of a large cup					
Capacity of a large water bottle					
Capacity of a juice carton					
Capacity of a small water bottle					
Capacity of a drink can					
Capacity of a yoghurt bottle					
Capacity of a large bowl					
Capacity of a flask					
Capacity of a beaker					
Capacity of a butter tub					
Capacity of a biscuit tin					
Capacity of a pencil case					
Capacity of a soap dish					
Capacity of a plant pot					
Capacity of a small bin					

### Start Playing:

1. Each team is allocated 5 objects from the list (or an amount equal to the number of players in the team).
2. Each team must come up with estimate capacities for their 5 objects. Although teams can confer, the players on each team should be responsible for estimating the capacity of 1 object each. It should be explained to the children that the winning team will be the team that estimates most accurately.
3. When the children are happy with their estimates, they should write them up on the whiteboard in the appropriate space on the grid.
4. Each child should also rename the unit of capacity in the adjacent space on the whiteboard e.g. 1l 250ml = 1250ml.
5. Only after a team has filled in its estimates on the whiteboard should it collect its measuring containers. Each team collects a selection of measuring containers of different capacities (250ml, 500ml and 1 litre) and shapes (tall, wide and narrow).
6. Each child on the team fills his/her object with water.
7. The child then pours all the water from the object into an empty measuring container.
8. The child looks at the markings on the measuring container to measure the exact volume of water. This measurement is the capacity of the object.
9. As before, the measurements are then filled in on the grid on the whiteboard, with the teacher checking to make sure the measurement is accurate each time, and working with the children where necessary.
10. Along with filling in an item's capacity on the whiteboard, each child should also rename the capacity as either a fraction or a decimal. (If a fraction is chosen only  $\frac{1}{4}$ ,  $\frac{1}{2}$  or  $\frac{3}{4}$  should be used).
11. The children then go back to their teams.
12. Using the paper and pencils, each child must work out the difference between the estimate and the actual capacity of his/her object, by taking the smaller measurement from the bigger measurement.
13. The child then writes up his/her answer in the 'Difference' column on the classroom grid.
14. The children can also physically see the difference between their estimates and the actual capacities of their objects.
15. Each child should pour into a measuring container, the amount of water that he/she estimated to be the capacity of his/her object to be.
16. Then the child should start to pour this volume of water into his/her empty object. If the estimate was lower than the actual capacity, the child can see how much more water would be required to fill the object. If the estimate was higher than the actual capacity, the child can see how much excess water is left in the measuring container.
17. When all of the answers are written up in the 'Difference' column, the teacher goes through the answers on the whiteboard to ensure that they are correct.
18. The teacher explains that the smaller the difference, the closer that person was to guessing the actual capacity of his/her object.
19. Finally, the measurements in the 'Difference' column for the 5 objects of each team are added together.

20. The winning team is the team with the smallest answer i.e. the smallest combined difference between the estimates and the measurements of their allocated objects.

Further activity:

1. The children can now generate their own multiplication and simple division questions for each other using dice.
2. The children should use the measurements in the 'Actual Perimeter' column to multiply, and then divide, by the numbers they roll on the die.