HOW FULL IS A BUCKET?
An outside activity

Learning Objective:
Improve estimation and measuring of capacity.

Intended Outcome:
Improved estimation of capacity over the course of the game.

Materials:

- Unmarked containers (e.g. cups, bottles, and a small bucket) for each team
- A bucket or tub for each team
- Measuring containers for judging (e.g. calibrated beakers and tubes)
- Water (and a nice day)
- Paper and pencils for recording results

Game Objective:
To be closest to the added capacity total at the end of the game.

Instructions:
Organise the whole class into teams (4–6 in each team is good).

1. Set up each team with empty unmarked containers and a tub of water each.
2. The teacher calls out an amount of water for the teams to measure, e.g. 300mL.
3. Teams fill their empty containers with water to what they think is the called amount. Each team sends one member with their estimated amount of water to the teacher to be judged.
4. The teacher helps the students to measure the amount of water using the calibrated containers.
5. Teams score the difference between their estimated amount and the called amount (It doesn't matter if they are over or under). So, if 300mL was called, a team with 250mL will score 50 points, and a team with 375mL will score 75 points.

6. Teams record their points on a record table, like so:

Called Measurement	Actual measurement	Difference (points)
300ML	250ML	50ML
1L	890ML	110ML
750ML	775ML	25ML

7. Call out varying amounts to be estimated (e.g. 300mL, 500mL, 10 mL, 1L, 750mL, 50mL, 4 L). Do this enough times so that each team member has at least one turn at bringing up and measuring the team's water.
   Hint: It is interesting to call one measurement that is greater than the maximum capacity of their containers to see how they solve the problem! Or, as a last call, let the students decide upon an amount and have them tell the teacher that decided amount before measuring their estimation.
8. At the game's conclusion, calculate the total of points each team has. The team with the smallest number of points wins.

Variations:
- When scoring, award 1 point to the team who has the closest estimation. The team with the highest total of points wins.
- Or, add another column to the table for the percentage difference. So, difference ÷ called measure x 100 = percentage difference (e.g. 50 ÷ 300 = 16.66%).
- Another variation when scoring is to work out the average difference for each team, the team with the lowest average difference wins. See how the whole class performs by working out the class average.