

Brain-Teaser

Aim:

Teams start with one 16 litre container full of water each. Teams must transfer water between different containers until they have one container that contains exactly 8 litres. The first team to do so is the winner.

Equipment Needed:

Masking tape, chalk or witches hats

- Pencil and paper for each team
- 3 containers for each team:
 - 16 Litre Container
 - 10 Litre Container
 - 6 Litre Container (These Containers should have their TOTAL capacity clearly marked on them, but NOT any level indicator other than that.)

8 Litre Container (for judging the winner)

(You may need to modify some tubs, buckets, or containers to get the right capacities. Permanent markers should do the trick, or a hacksaw.)

Set up & Briefing:

- Fill each team's 16 litre container with water
- Place the other 2 containers 15-20 metres from the largest container to form a triangle. Mark these spots with an "X" or a witch's hat.
- Explain that in many parts of the world, for example some villages in Africa, a person may only use around 10 - 16 litres of water per day for all their personal needs: drinking, cooking, personal hygiene and household cleaning. (This doesn't count extra that they might use to wash clothes, water plants, give to animals for drinking, or use for making mudbricks for houses, etc.) Their water source might be a communal well, or a spring or stream that might be between 1 hour and 2 hours walk away.
- Compare this to the average Australian who uses over 200 litres per day. For example a shower uses on average 30 litres, one flush of the toilet is around 10 litres and one load in the washing machine uses between 150 and 250 litres.
- Explain that the aim of the game is for teams to transfer water between the different containers until they have one container which holds exactly 8 litres (which is the amount needed for cooking and drinking).

Rules:

- No estimating or guessing is allowed. The amount of water can only be determined by knowing the exact amount that is in any container at a given time.
- A major spill will result in the team having to start again.
- Any container can be moved to any other container but it must be moved back into its original position before another container can be moved.

- Pencil and paper can be used to help plan a strategy or to keep track of how much water is in each container as the water is being transferred back and forth.

The Secret (This is not the only way to solve the problem, but you can use this to give hints to teams having trouble):

	6 Litre Container	10 Litre Container	16 Litre Container
Amount at Start	0	0	16
1st Transfer	6	0	10
2nd Transfer	0	6	10
3rd Transfer	6	6	4
4th Transfer	2	10	4
5th Transfer	2	0	14
6th Transfer	0	2	14
7th Transfer	6	2	8

To do this activity with containers of 8L, 5L and 3L capacity, aiming for 4 litres for victory, just halve all the amounts.

To do it with containers of 4L, 7L, and 10L capacity, aiming for 5 litres for victory use the following formula:

	6 Litre Container	10 Litre Container	16 Litre Container
Amount at Start	0	0	16
1st Transfer	6	0	10
2nd Transfer	0	6	10
3rd Transfer	6	6	4
4th Transfer	2	10	4
5th Transfer	2	0	14
6th Transfer	0	2	14
7th Transfer	6	2	8

In either case, you'll have to adjust the blurb. It's good to link this activity into the everyday experience of people who have to collect their water to meet their personal needs.

Post-play Thinkspots:

- What would it be like to walk for an hour or more to collect all your water? What sort of activities might you miss out on in order to do this job?
- What sorts of problems might arise because of water shortages?
- The World Health Organization estimates that 80% of all disease in the world is caused by either: contaminated water, water shortage, or lack of access to clean water or sanitation. What can be done to give more people access to clean water?