

Calculating Capacities

Challenge 1

Using the same containers (the jug and/or the cup) can you make each of these amounts?

- a) 200 ml b) 500 ml c) 600 ml d) 700 ml

Answers

Note: There may be other valid answers.

a) 200 ml

- i. Fill jug (500 ml).
- ii. Fill cup (300 ml) from jug.
 $500 \text{ ml} - 300 \text{ ml} = 200 \text{ ml}$.
- iii. There is 200 ml left in the jug.

b) 500 ml

- i. Fill jug (500 ml)

c) 600 ml

- i. Fill cup (300 ml) twice.

d) 700 ml

- i. Fill jug (500 ml).
- ii. Pour 300 ml in cup. 200 ml left in jug.
- iii. Empty cup.
- iv. Pour the 200 ml left in jug in the cup.
- v. Fill jug (500 ml) again.
- vi. $500 \text{ ml in jug} + 200 \text{ ml in cup} = 700 \text{ ml in total}$

Challenge 2 (you can empty and/or fill bottles more than once)

How can you measure **1 l** if you have a **1.5 l** bottle and a **4 l** bottle?

Challenge 3 (you can empty and/or fill bottles more than once)

How can you measure **2 l** if you have a **2.5 l** bottle and a **1 l** bottle?

Challenge 2

- i. Fill 4 l bottle.
- ii. Fill the 1.5 l bottle from the 4 l bottle.
- iii. Empty the 1.5 l bottle and repeat.

$$1.5 \text{ l} + 1.5 \text{ l} = 3 \text{ l}$$

$$4 \text{ l} - 3 \text{ l} = 1 \text{ l}$$

There is 1 l left in the 4 l bottle.

Challenge 3

- i. Fill 1 l bottle and pour into the 2.5 l bottle.
- ii. Repeat.
- iii. You have 2 l in the 2.5 l bottle.

Game time!

1. **Make** these capacity **flashcards** using rough paper or cereal box carton.
2. **Use 3 different containers** you find at home. (e.g. mug, water bottle, yogurt cup, washing liquid container, etc.)
3. **Measure and know their capacity** when full (to the nearest 5 *mℓ*).

25ml	50ml	75ml	1l	1.25l
1.5l	1.75l	2l	2.25l	2.5l

4. First player turns **one flashcard** and tries to make that capacity using all containers.
5. If player succeeds s/he **keeps the card**.
6. **Take turns and repeat** until there are no cards left.
7. Player with **most cards wins**.

Note: Since you are using real containers, some capacities are hard to get or cannot be resolved. The important thing is to keep trying and challenge yourself.

E.g. We chose 2 jars and a spray can.

Jar A – 50 *mℓ*

Jar B – 125 *mℓ*

Spray bottle – 625 *mℓ*

First card – 25 <i>mℓ</i>	Second card 1.25 <i>ℓ</i>
i. Fill Jar B.	i. Fill Jar B for 4 times.
ii. Fill Jar A from Jar B.	$125 \text{ mℓ} \times 5 = 625 \text{ mℓ}$
iii. Empty Jar A.	ii. Fill spray bottle (625 <i>mℓ</i>).
iv. Fill Jar A from Jar B again.	$625 \text{ mℓ} + 625 \text{ mℓ} = 1250 \text{ mℓ}$
v. There is 25 <i>mℓ</i> left in Jar B.	1.25 <i>ℓ</i>

Conclusion:

*Since we chose containers such as 125 *mℓ* we could calculate all capacities.*