Metric conversions for capacity

Capacity

1 litre of water would fill a volume of **1000 cm³**.
1 millilitre of water would fill volume of **1 cm³**.
1000 litres of water would fill a volume of **1 m³**.

$1\,L = 1000\,cm^3$

$1\,m\ell = 1\,cm^3$

$1000\,L = 1\,m^3$

1 L weighs one kilogram.

Examples

Example 1
Mene's drink bottle had 1·8 ℓ stamped on the side.
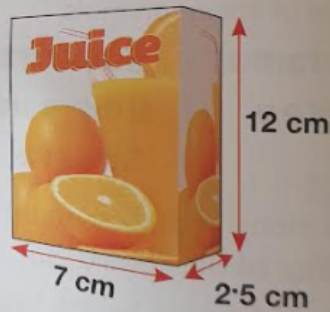How many cm³ will the drink bottle fill?

$1·8\,L = 1·8 \times 1000\,m\ell$
$= 1800\,m\ell$

$1800\,m\ell = \mathbf{1800\,cm^3}$

Example 2
Tess wanted to know which of these held more juice.

12 cm

7 cm   2·5 cm

Juice
0·2 L

Convert both volumes to mℓ.

Volume of juice in jug is $0·2\,L = 0·2 \times 1000\,m\ell$
$= 200\,m\ell$

Th	H	T	O	t	h	th
			0	2		
		2	0	0		

0·2 × 1000

Volume of carton of juice $= l \times w \times h$
$= 7 \times 2·5 \times 12$
$= 210\,cm^3$
$= 210\,m\ell$

NUMERACY STRATEGY

$7 \times 2·5 = (7 \times 2) + (7 \times 0·5)$
$= 14 + 3·5$
$= 17·5$

$17·5 \times 12 = (17·5 \times 10) + (17·5 \times 2)$
$= 175 + 35$
$= 210$

The carton has more juice.

Discussion

• Explain how place value and the metric system are connected.
• In the place value chart in Example 2, why was the

Activity 1

1. Convert
   a. 2 L to cm³
   b. 500 ml to cm³
   c. 4000 L to m³
   d. 36 000 L to m³
   e. 3·5 L to cm³
   f. 3459 ml to cm³
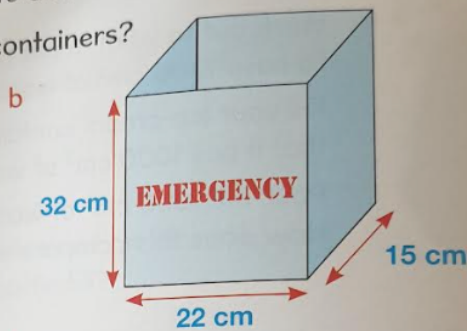   g. 3 m³ to L
   h. 12·67 m³ to L
   i. 42·865 m³ to L
   j. 5234 cm³ to L
   k. 12 907 L to m³
   l. 0·346 m³ to L

2. Practical Plastics makes plastic freezer containers for storing food for emergencies. They want to write the capacity in cm³, ml and L on each one.
   What would they write on each of these containers?

   a. EMERGENCY — 14 cm, 8 cm, 28 cm

   b. EMERGENCY — 32 cm, 15 cm, 22 cm

   c. EMERGENCY — 16 cm, 4·5 cm, 12 cm

   d. EMERGENCY — 2 cm, 40 cm, 25·6 cm

3. If all four of the containers in question 2 were filled with water, how much would they weigh in total if these were the masses of the containers?
   a. 0·26 kg
   b. 0·74 kg
   c. 0·09 kg
   d. 0·18 kg

4. When their pipes burst one winter, the Buckley family had to fill their sinks and bath with water using buckets.
   How many 20 L buckets were needed to fill these?
   a. a bath with a volume of 1·25 m³
   b. a laundry tub with a volume of 46 000 cm³

   Remember 1 L of water weighs 1 kg.

5. Jamie went shopping an...