

Maths Around the World

Volume & Capacity Around the World

How does the world measure liquids and capacity?

We measure liquids when cooking, shopping, travelling and working with everyday containers. Different countries may use different units, but the mathematics connects them all.

Metric units

Litres (L)
Millilitres (mL)

Common in India and most countries.

US customary units

Gallons
Quarts
Pints
Cups
Fluid ounces

Important idea

A litre and a gallon are not the same size. When comparing quantities across countries, we need to know which unit is being used.

Different units. Same mathematics.

■ The Metric System

The metric system makes many capacity conversions straightforward because the units are based on powers of 10.

1 litre (L)

1,000 millilitres (mL)

1 millilitre (mL)

0.001 litre (L)

2.5 litres

2,500 millilitres

Examples

$$750 \text{ mL} = 0.75 \text{ L}$$

$$3 \text{ L} = 3,000 \text{ mL}$$

$$1.5 \text{ L} = 1,500 \text{ mL}$$

Real life

Milk, juice, water and many household liquids are commonly labelled in litres or millilitres.

■ Cups, Pints, Quarts & Gallons

In the United States, everyday liquids may be measured using customary units.

Common US customary relationships

1 gallon = 4 quarts
1 quart = 2 pints
1 pint = 2 cups
1 US cup = 8 US fluid ounces

Approximate metric comparisons

1 US gallon $\approx$ 3.79 L
1 US quart $\approx$ 0.95 L
1 US pint $\approx$ 0.47 L
1 US cup $\approx$ 237 mL

Example

A 1 US gallon container holds approximately **3.79 litres**.

■ Can You See the Connection?

The same amount of liquid can be described using different units depending on where you are.

A bottle contains 2 litres of water.

$$2 \text{ L} = 2,000 \text{ mL}$$

Think internationally

A US gallon is approximately 3.79 L.

So 2 L is a little more than half a US gallon.

The liquid has not changed.

Only the unit used to describe its capacity has changed.

■ Maths in Real Life

Cooking

A recipe needs 500 mL of milk.

$$500 \text{ mL} = \mathbf{0.5 \text{ L}}$$

Shopping

A family buys 3 bottles of 1.5 L juice.

$$3 \times 1.5 = \mathbf{4.5 \text{ L}}$$

Travel

A container holds 1 US gallon.

Think about your own life: Where do you see litres, millilitres, cups or gallons?

■ Quick Conversion Corner

Metric conversions

$$\text{L} \times 1,000 = \text{mL}$$

$$\text{mL} \div 1,000 = \text{L}$$

Approximate US customary conversions

$$1 \text{ US gallon} \approx 3.79 \text{ L}$$

$$1 \text{ US quart} \approx 0.95 \text{ L}$$

$$1 \text{ US pint} \approx 0.47 \text{ L}$$

$$1 \text{ US cup} \approx 237 \text{ mL}$$

Remember

The exact value can depend on the measurement system. These conversions are useful everyday approximations for US customary units.

■ Can You Work It Out?

1. Convert **4 L** into millilitres.

2. Convert **2,500 mL** into litres.

3. A recipe needs **750 mL** of water. How many litres is that?

4. Approximately how many litres are in **2 US gallons**?

5. **Challenge** A container holds **5 L**. Approximately how many US gallons is that?

Challenge yourself: Find a drink container at home and record its capacity in both litres and millilitres.

■ Maths Connects Us All

Whether a recipe says litres, millilitres, cups or gallons, mathematics helps us understand how much is actually being measured.

Metric

India and many countries → litres and millilitres

US customary

United States → gallons, quarts, pints, cups and fluid ounces

Different units. Different countries. One mathematics.

Understanding conversions helps us communicate, travel, cook and learn across borders.

Answers

1. $4 \text{ L} = 4,000 \text{ mL}$

2. $2,500 \text{ mL} = 2.5 \text{ L}$

3. $750 \text{ mL} = 0.75 \text{ L}$

4. $2 \text{ US gallons} \approx 7.58 \text{ L}$

Key idea

Capacity can be described in different units around the world. Conversions allow us to understand the same quantity wherever we are.

Note: US customary conversions in this resource are rounded everyday approximations.